

Current Concepts in Evaluation and Management of Sports Related Concussion

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BI/SCI Expo at Carolinas Rehabilitation
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Trauma found in late Penn football player's brain

Routine Goal-Line Football Injury
and Unsettling

**Former NFL star Junior
Seau reportedly commits
suicide**

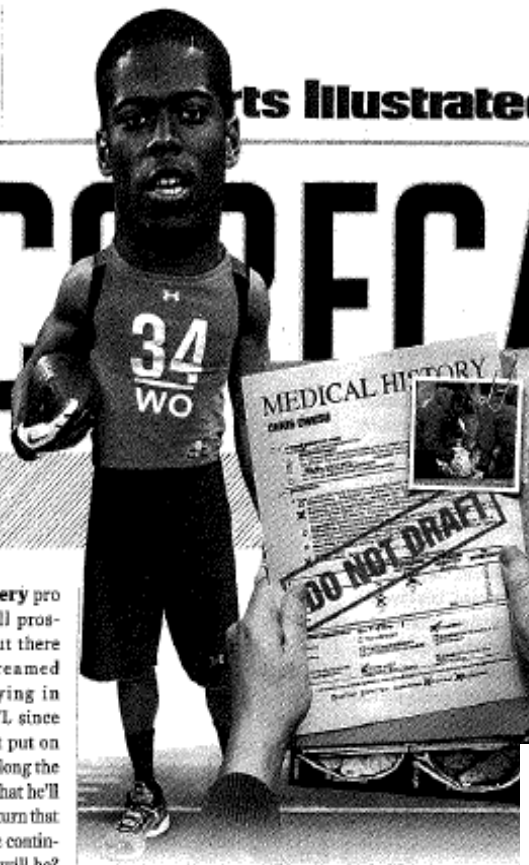
May 2, 2012

“Deaths of Football Players: From the Field to the Courtroom”
Football analysts cast new eye on
concussions

Edited by
RICHARD O'BRIEN
AND ADAM BUTERSON

Sports Illustrated

SCOUTS



Most every pro football prospect out there has dreamed of playing in the NFL since he first put on cleats and a helmet. Along the way he has been told that he'll have an opportunity to turn that dream into reality if he continues to work hard. But will he? More to the point, should he? For pro prospects with a history of major concussions that's a potentially life-altering and even life-threatening question. It's also one that all teams are facing on the eve of this week's draft. And while teams may base their answers on self-interest, their seemingly unfair exclusion of players may actually point to a beneficial course of action that could one day become policy.

Heading for Trouble

As an NFL draft prospect is downgraded a history of concussions, the question arises: Should this be the way of the future?

BY JIM TROTTER

“Most every pro football prospect out there has dreamed of playing in the NFL since he first put on cleats and a helmet. Along the way he has been told that he'll have an opportunity to turn that dream into reality if he continues to work hard. But will he? **More to the point, should he?**”

you draft him you're going to be under the microscope the whole time. Every time he gets hit, it's going to be magnified tenfold.”
Because every brain injury is different and scientific research

“Currently more than 1,000 former and current players are plaintiffs against the NFL, claiming the league failed to adequately treat concussions and educate players about potential long-term consequences of brain trauma.”



BAN COLLEGE FOOTBALL

PRESENTED BY

*intelligence*²
DEBATES

Corruption and a growing concern for head injury have put college football in the spotlight. Are football programs' millions in profits exploitation? Or are they still a celebration of amateur sport? Does football's inherent danger and violence have any place in institutions of higher learning? Or does it provide young men with educational opportunities they would not otherwise have?

*Arguing for the motion will be **Malcolm Gladwell** and **Buzz Bissinger**, arguing against will be **Jason Whitlock** and **Tim Green**.*

May 8, 2012 – On-line debate FOR A.tv

1937

“During the past 7 years the practice has been too prevalent of allowing players to continue playing after a concussion. Again this year this is true. Sports demanding personal contact should be eliminated after an individual has suffered a concussion.”

Concussion Defined

- American Academy of Neurology (AAN):
 - Traumatically induced alteration in mental status caused by a direct or indirect blow to the head
 - Emphasizes that concussions may occur w/o LOC
- Functional NOT Structural Injury



Concussion Epidemiology - *Current Trends*

Football, ice hockey, soccer and lacrosse have the highest concussion incidence rates when calculated by athlete exposure (*HS & College combined*).

Competition concussion incidence rates are consistently higher than *practice* rates.

In sports with the same rules (*basketball & soccer*), recent research suggests the reported concussion incidence rate is higher in females.

Reported differences between the incidence of concussion between *adolescent* and *adult* athletes is inconclusive.

(*Lincoln et al., 2011; Hootman et al., 2009; Gessel et al., 2007*)

Sport-related Concussion

Short Term Risks of Mismanagement

What are the risks of trivializing the injury?

Worsening of post-concussive signs and symptoms

Repeat concussion with post concussion syndrome

School-related issues in student athletes

Second Impact Syndrome (younger athletes)

Long Term Risks of Mismanagement

What are the risks of ignoring recurrent concussions?

Prolonged concussion symptoms (daily basis)

Depression, cognitive impairment, dementia, CTE

Long-term academic issues in student athletes

Decreased Quality of Life

THAT'S GOTTA HURT ...

Pittsburgh Steelers running back Destry Wight lies injured on the field Sunday night after he dislocated his right ankle and broke his right leg.





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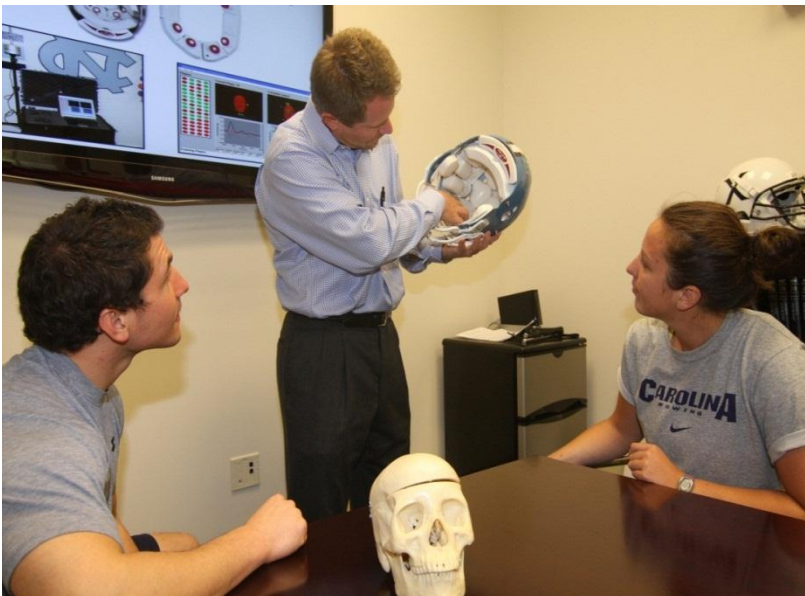


Bridging

the gap

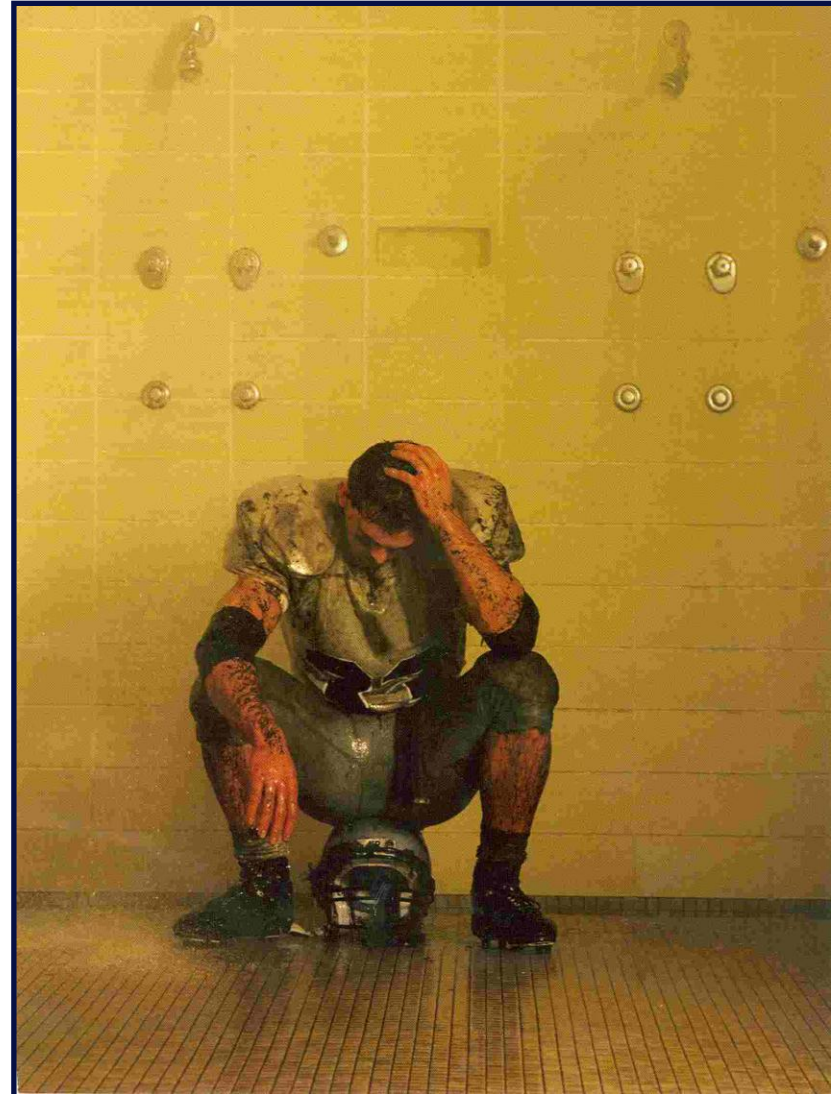


***between
research
and
clinical
practice***



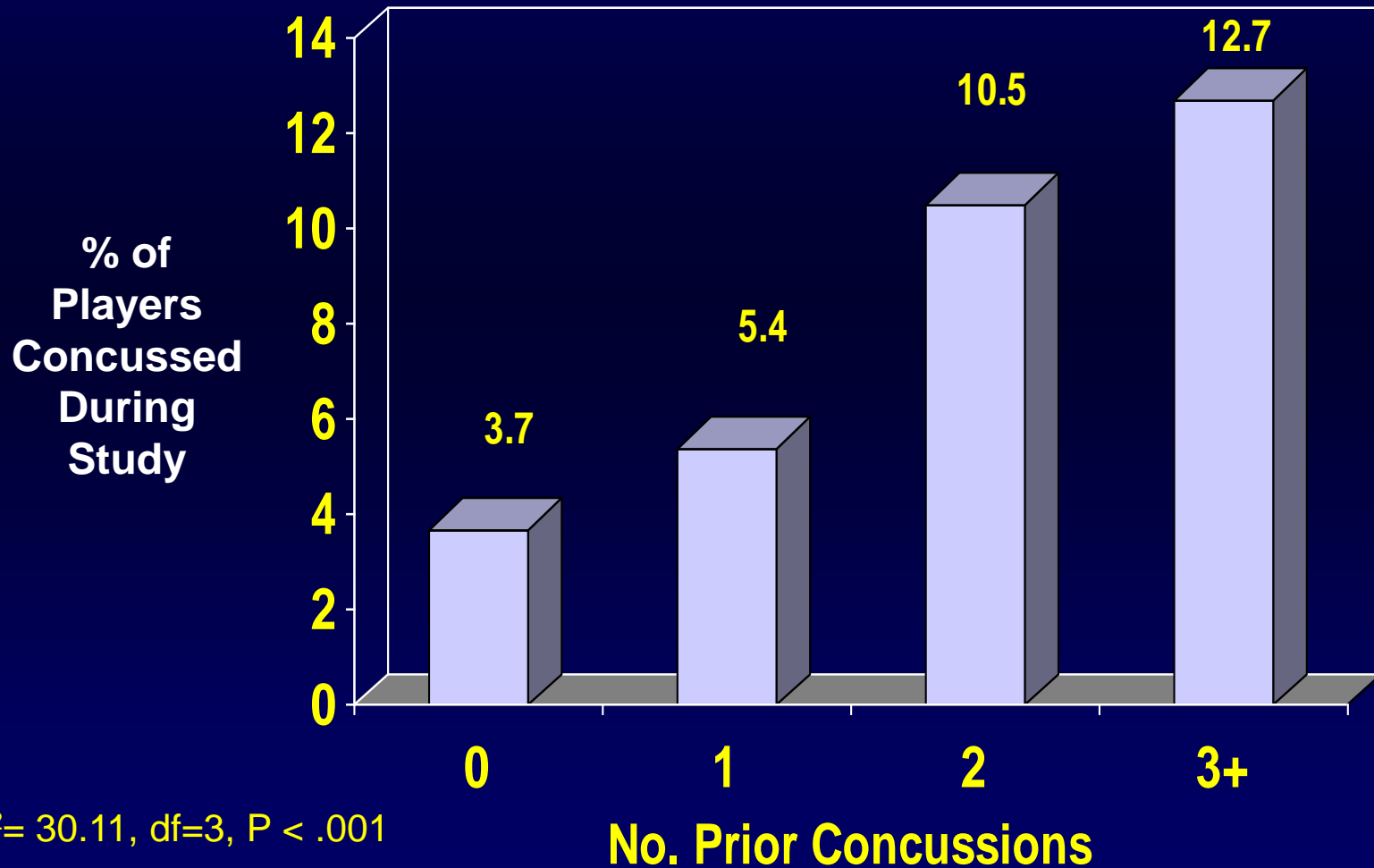
Objectives: Clinical Dilemmas

- How to objectively assess concussion
- Return to Play?
- Home care instructions
- How many is too many?
- Cumulative Effects?
- Grading Scales?
- To rest or not to rest?
- School and other ADLs?
- Rehabilitation?

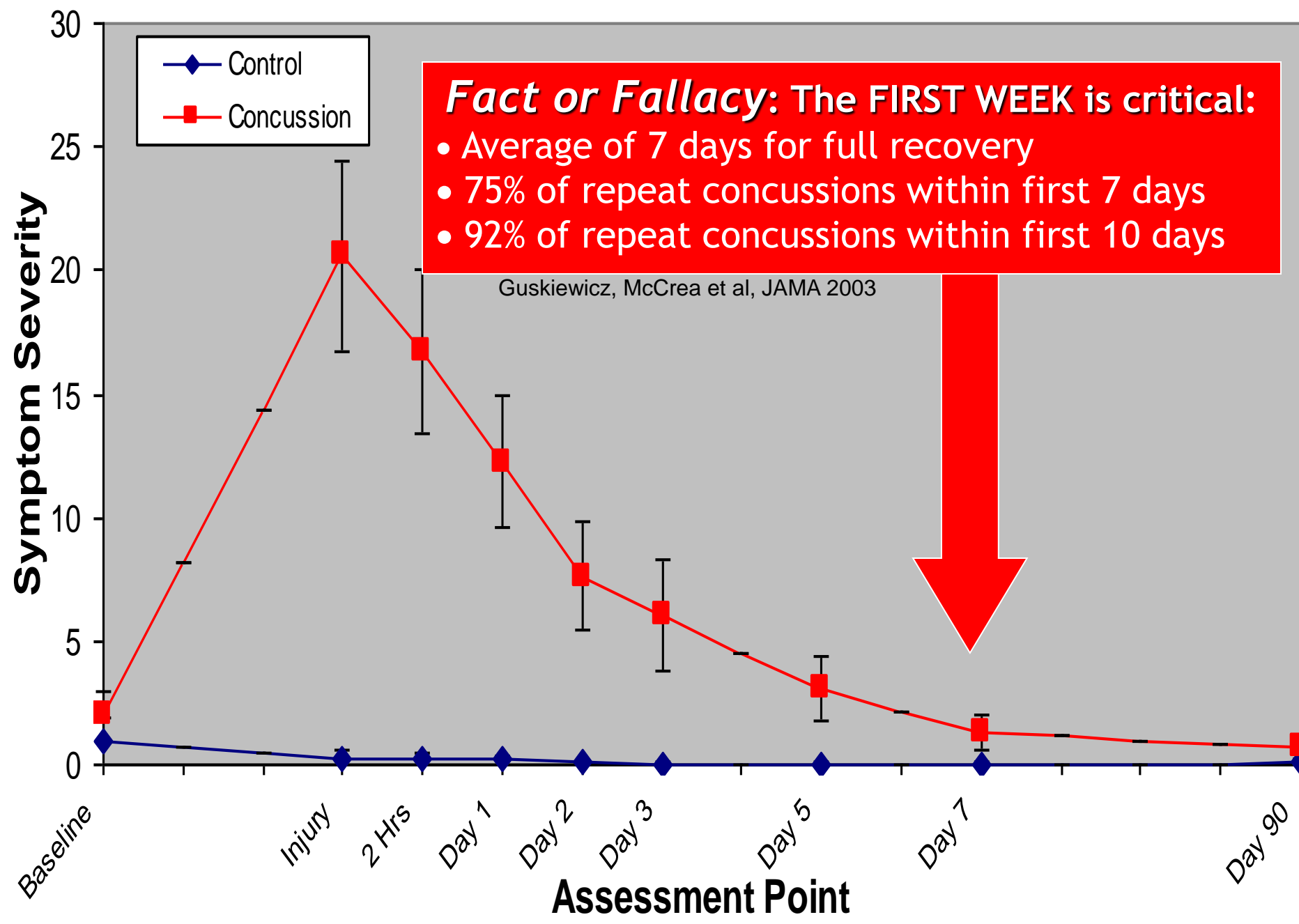


Concussion as a predisposition to future injury

196 total injuries/ 4,251 NCAA FB players (4.2%)



$\chi^2 = 30.11$, $df=3$, $P < .001$



How should I refer to the injury?

- Concussions are injuries to the *brain*
- Should not be dismissed as “ding” injuries
 - “Ding”/Grade 1 injuries resulted in neurocognitive deficits 36 hours after injury (Lovell et al., 2004)
- The grading dilemma:
 - Grade the concussion at time of injury - **NO!**
 - Grade concussion after symptoms have resolved - **Maybe**
 - *Always focus attention on recovery of S/S, NP testing, and balance*

Is concussion grading still recommended?

Grade 1 (Mild)	No LOC*; PTA[†] <30 minutes; PCSS[‡] <24 hours
Grade 2 (Moderate)	LOC <1 minute <i>or</i> PTA \geq30 minutes <24 hours <i>or</i> PCSS \geq24 hours <7 days
Grade 3 (Severe)	LOC \geq1 minute <i>or</i> PTA \geq24 hours <i>or</i> PCSS \geq7 days

***Loss of Consciousness**

[†]Post Traumatic amnesia (anterograde/retrograde)

[‡]Post Concussion signs/symptoms other than amnesia

Cantu R.C., *Journal of Athletic Training*, 2001, Vol. 36(3): 244-248

How do I evaluate a head injury?

- Baseline testing can be beneficial
- No different than any other injury:
 - Primary survey (Basic Life Support)
 - ABCs
 - Life threatening or Limb threatening
 - Secondary survey
 - Conduct normal injury evaluation
 - Focus on neurological deficits
- Don't just assume it's a typical concussion!

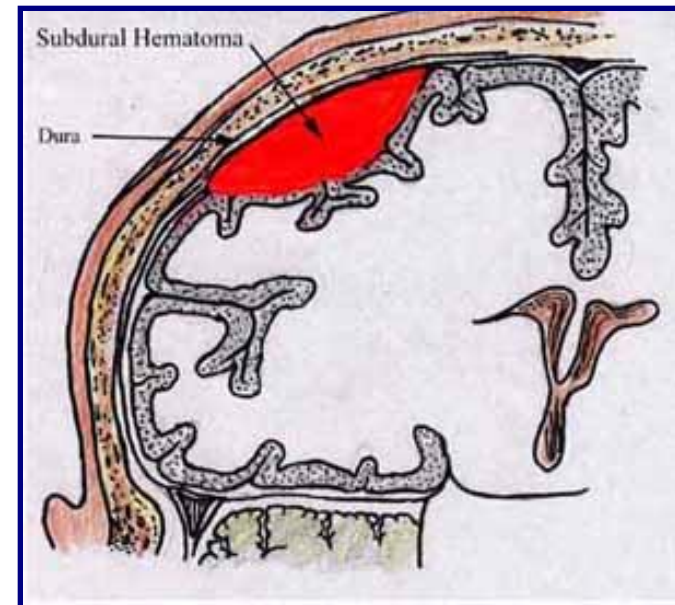
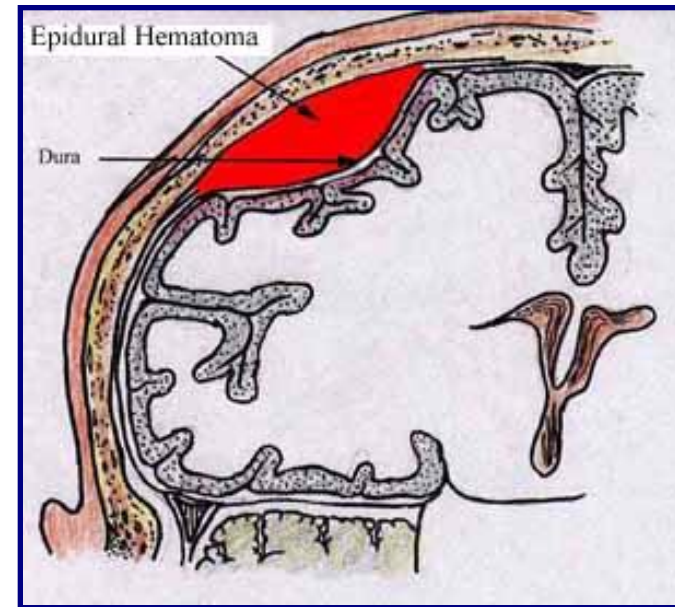
Red Flags...

- S/S lasting longer than 7-10 days
- Extensive loss of consciousness or amnesia
- Deterioration over time instead of resolution
- Compounded by multiple concussions
- Personality changes
- Other neurological disorders present

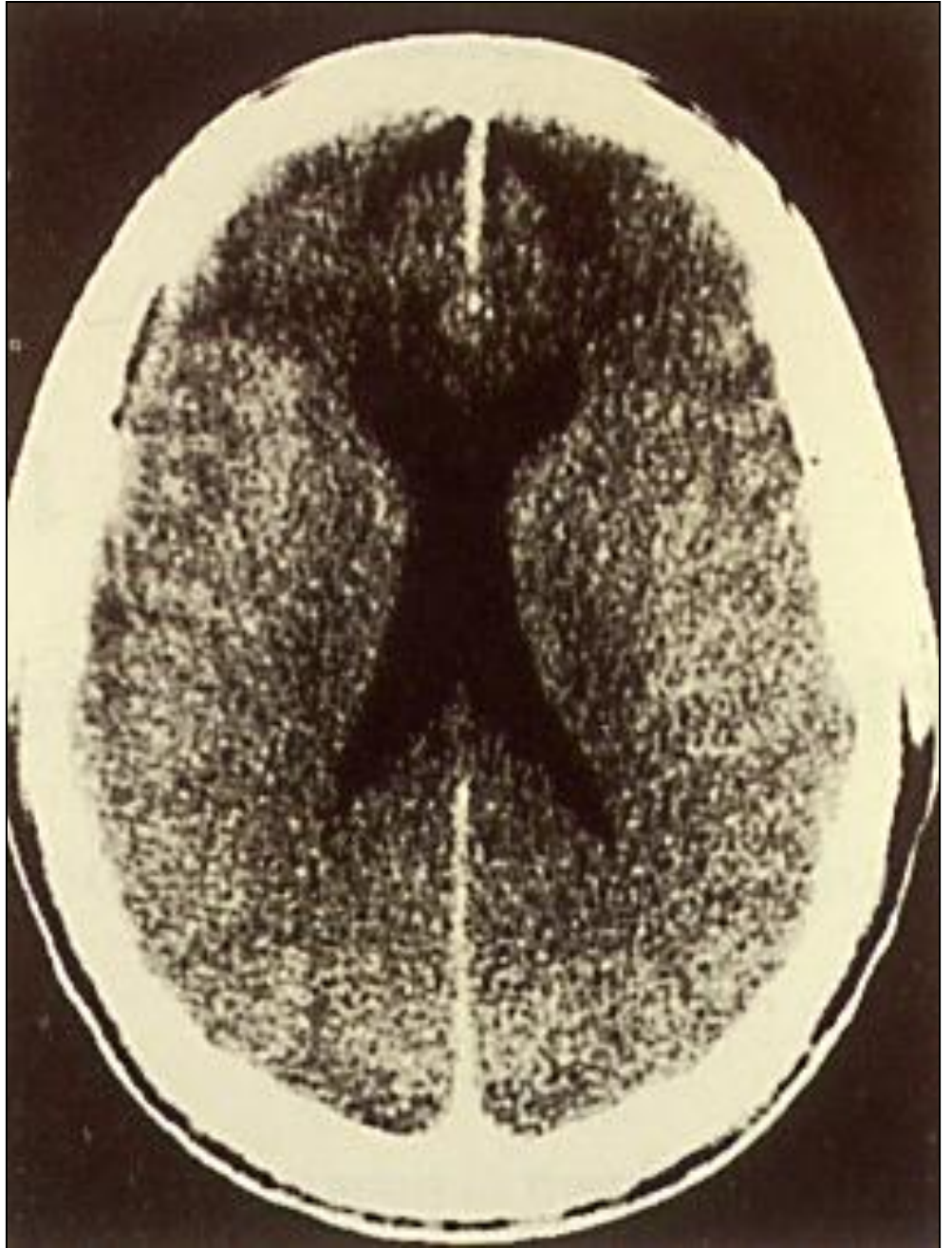


Concerns

- Epidural Hematoma - Arterial Bleed and Fast
- Subdural Hematoma - Usually Venous and Slower
- Subarachnoid Hematoma
- Second Impact Syndrome

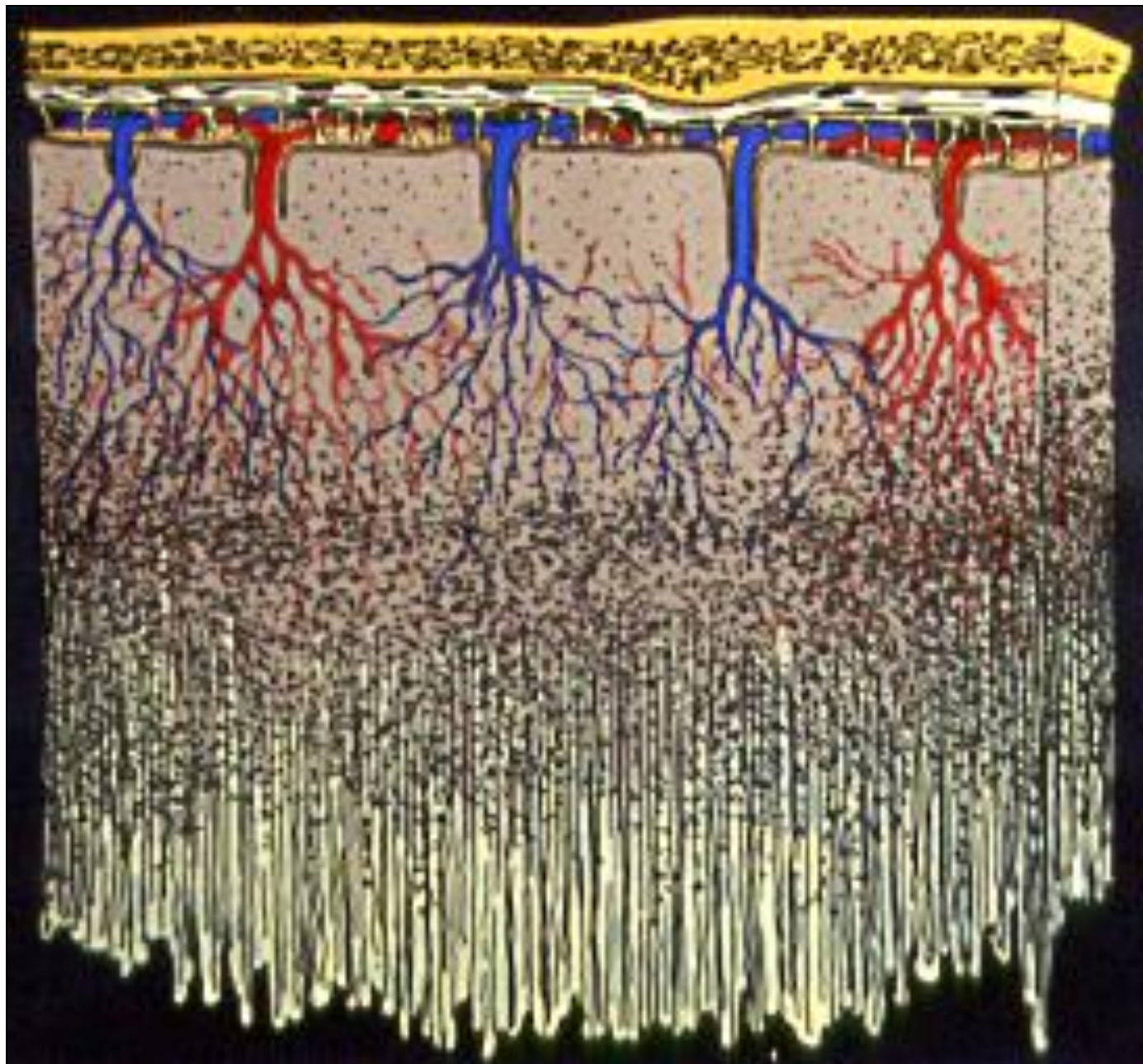


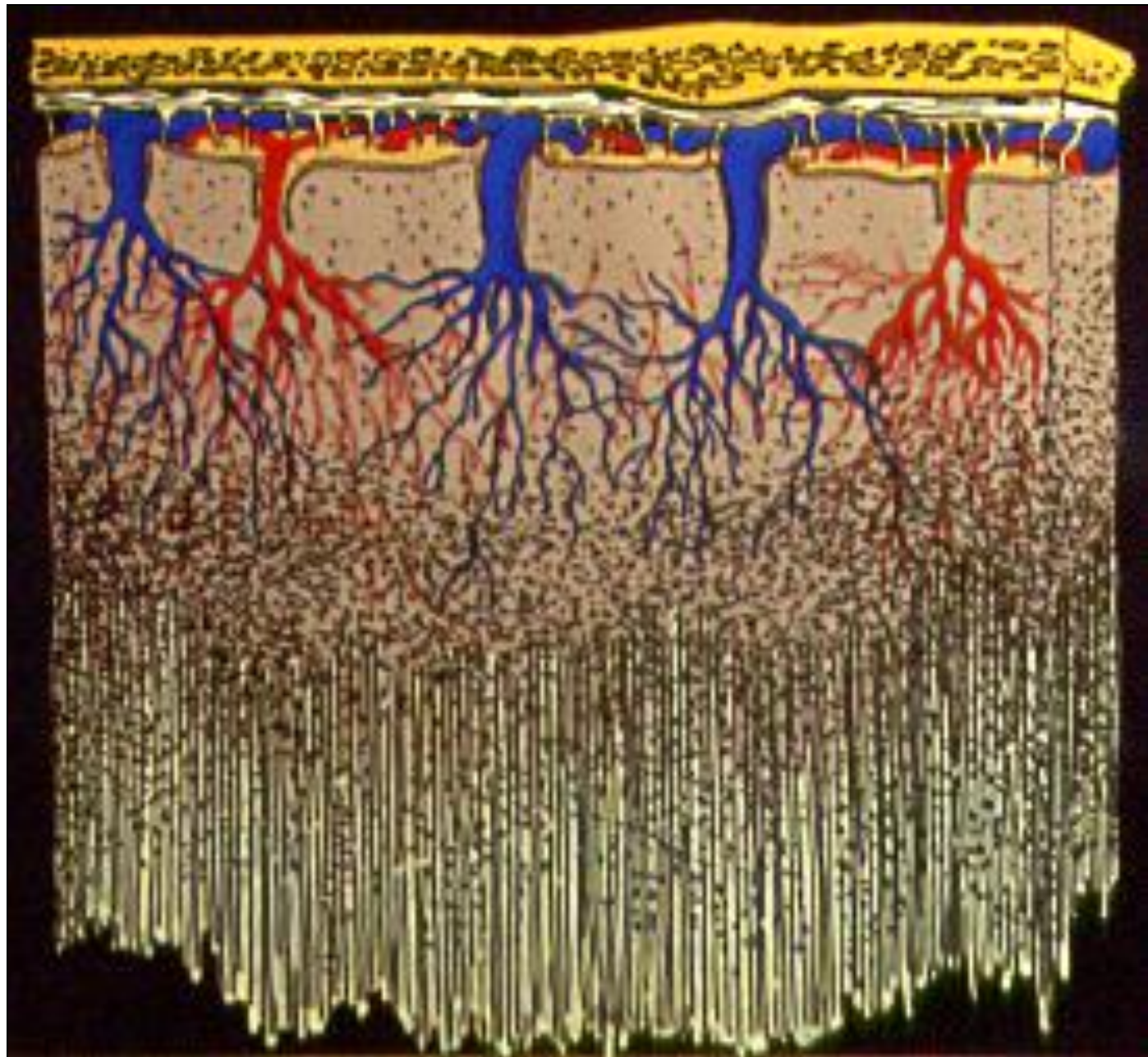
Second Impact Syndrome



Second Impact Syndrome

- Occurs when an athlete sustains a second head injury before symptoms from first have resolved (Cantu & Voy, 1995)
 - Loss of autoregulation of blood flow throughout the brain
- Different professionals discuss the condition in different ways
- 100% Morbidity, 50% mortality





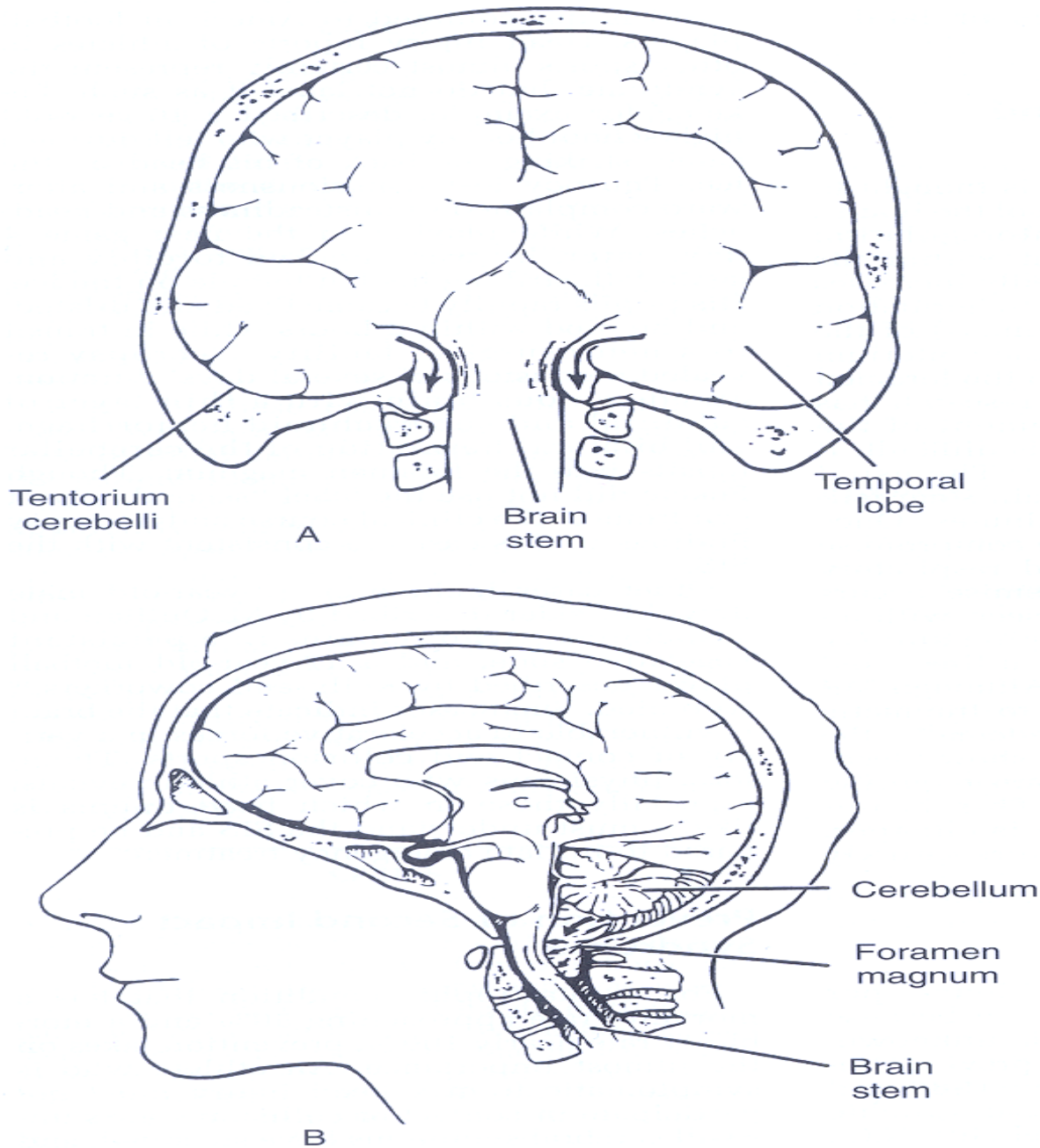


Figure 14-1. In second impact syndrome, vascular engorgement within the cranium increases intracranial pressure, leading to herniation of the uncus of the temporal lobe (*arrows*) below the tentorium in this frontal section (*A*), or to herniation of the cerebellar tonsils (*arrows*) through the foramen magnum in this midsagittal section (*B*). These changes compromise the brain stem, and coma and respiratory failure rapidly develop. The shaded areas of the brain stem represent the areas of compression.

Prevention of Catastrophic Brain Injury

- *Proper preparedness for on-field & sideline medical management of head injury becomes paramount when dealing with a more serious and quickly deteriorating condition.*
- If GCS <8, posturing, or not oxygenating well - be prepared to perform manual ventilations (endotracheal intubation, bag-valve-mouth resuscitation).
- Reduce ICP by elevating head to 30 deg and ensuring that the head and neck are maintained in a midline position to optimize venous outflow from the brain.
- Hyperventilation and intravenous diuretics such as mannitol (0.5-1.0 g/kg.) may also be used to decrease ICP.
- Being prepared for immediate transfer to a medical facility is extremely important under these conditions.

***Physical
Exam***

Mechanism

Symptomatology



Cognition

***Concussion
History***

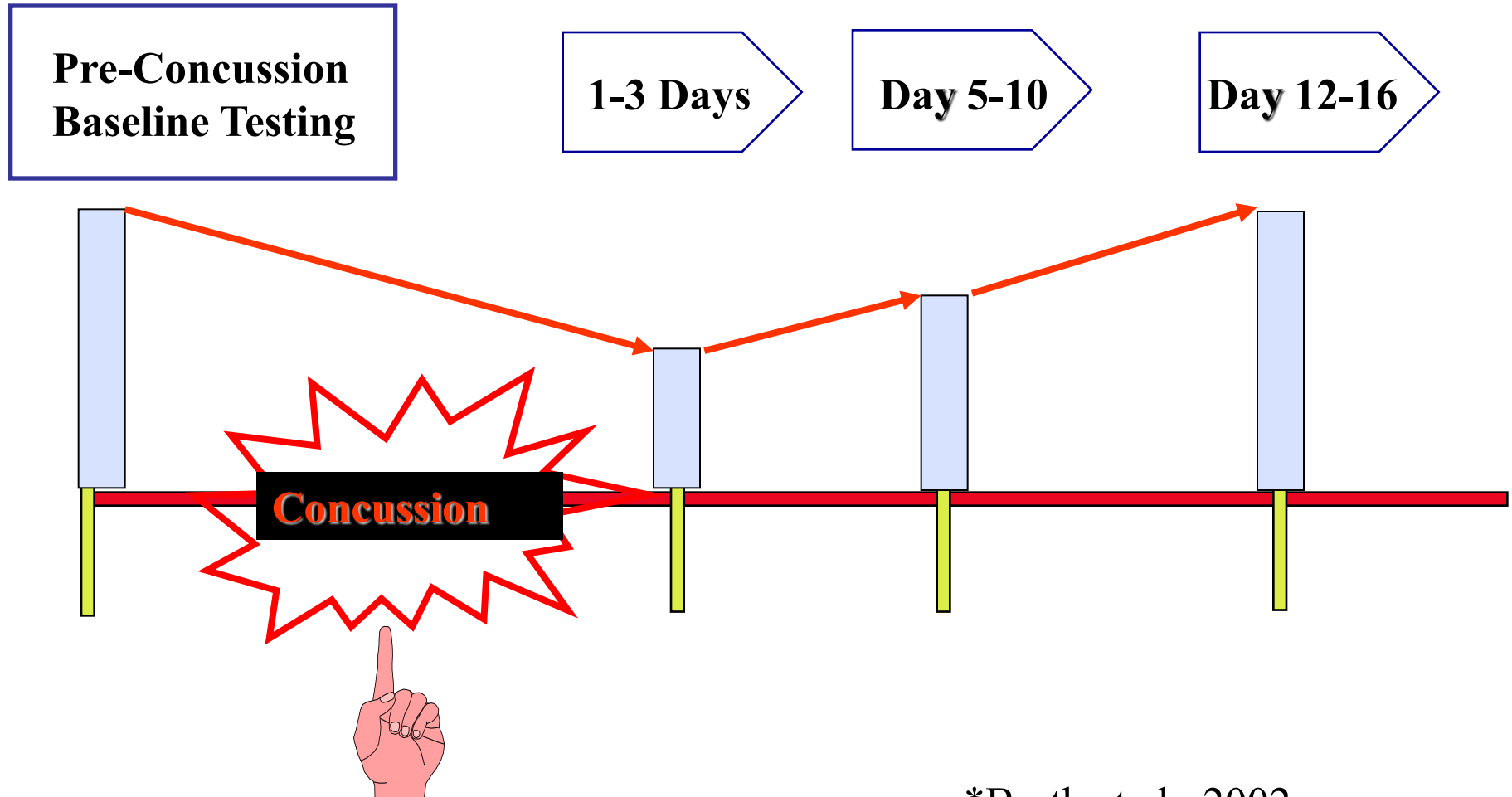
***Postural
Stability***

Concussion Assessment Protocol

- History
- Observation
- Palpation
- AROM/ PROM
- Strength Tests
- Stress Tests
- Functional Tests

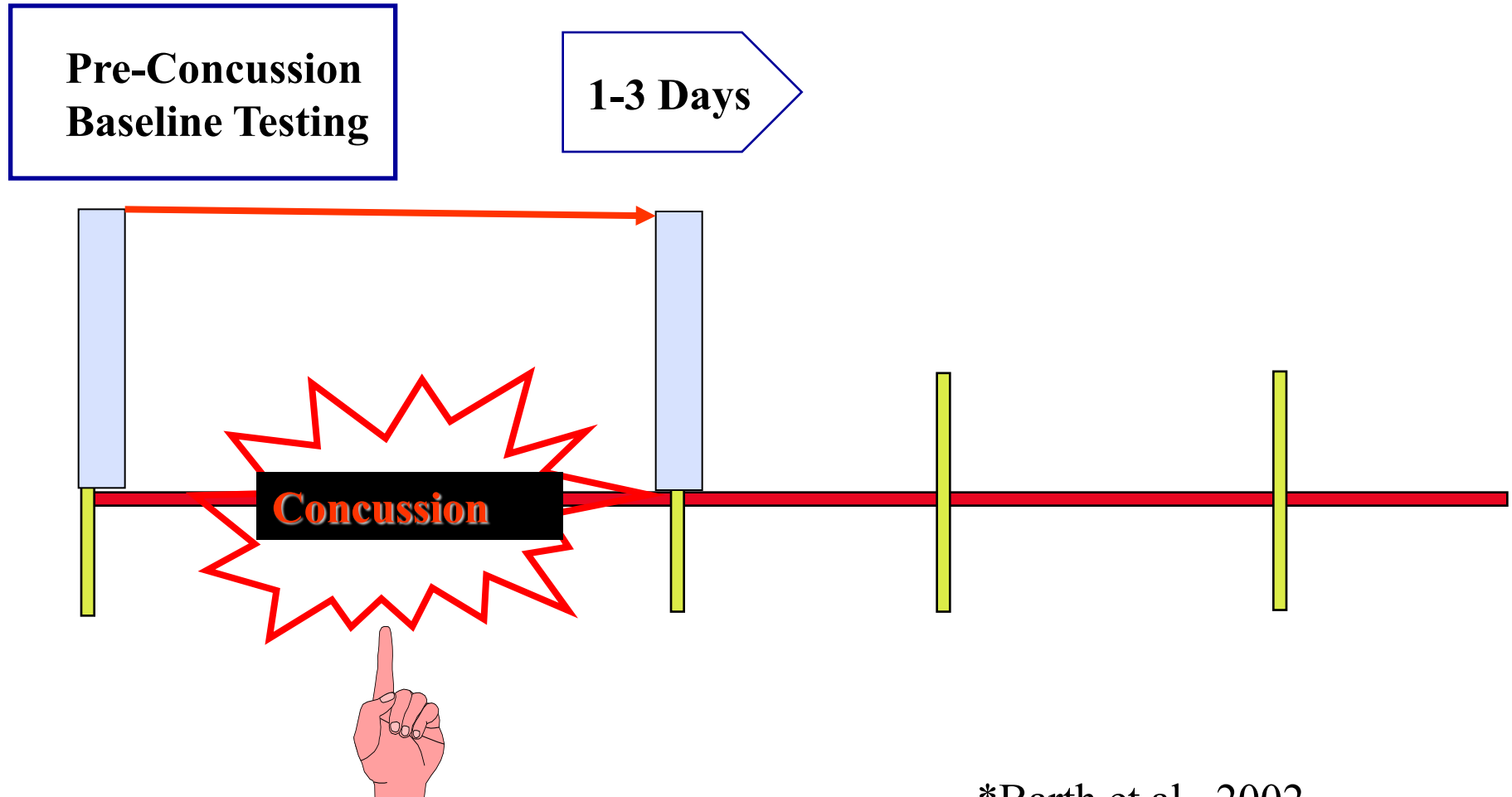


Sports as a Laboratory Assessment Model (SLAM*)



*Barth et al., 2002

Sports as a Laboratory Assessment Model (SLAM*)



*Barth et al., 2002

History

- General History
- Determine level of consciousness:
 - alert
 - lethargic
 - stuporous
 - semicomatose
 - comatose
- Determine symptoms:
 - headache
 - blurred vision
 - tinnitus
 - tenderness
 - nausea
 - numbness or weakness
 - dizziness
 - photophobia



Post Concussion Symptom Checklist

<u>SYMPTOM</u>	<u>NONE</u>	<u>MILD</u>		<u>MODERATE</u>		<u>SEVERE</u>	
	0	1	2	3	4	5	6
Headache							
Nausea/ Vomiting							
Balance Problems							
Dizziness							
Sensitivity to Light							
Blurred Vision							
Sensitivity to Noise							
Nervousness							
Numbness/ Tingling							
Feeling Slowed Down							
Feeling Like “In a Fog”							
Difficulty Concentrating							
Difficulty Remembering							
Neck Pain							
Fatigue/ Drowsiness							
Difficulty sleeping							
Sadness							
Irritability							

What does concussion “look like”?

Somatic

Headache
Nausea
Vomiting
Balance Problems
Sensitivity to Light
Sensitivity to Noise
Numbness/Tingling

Neurobehavioral

Sleeping more
Drowsiness
Fatigue
Sadness
Nervousness
Trouble Sleeping



Piland et al, 2007

Cognitive

Feeling Slowed Down
Feeling in a Fog
Difficulty Concentrating
Difficulty Remembering

Symptomatology

- **Most important guideline:**
 - No athlete returns to participation while still symptomatic
- **Using a graded symptom checklist allows for objective assessment of...**
 - variety of symptoms
 - severity of symptoms
 - duration of symptoms (i.e. - “resolution pattern”)
- **Important- Symptoms are Subjective**
 - ~38% of athletes reporting no symptoms may still demonstrate neurocognitive deficits (Broglia, 2008)

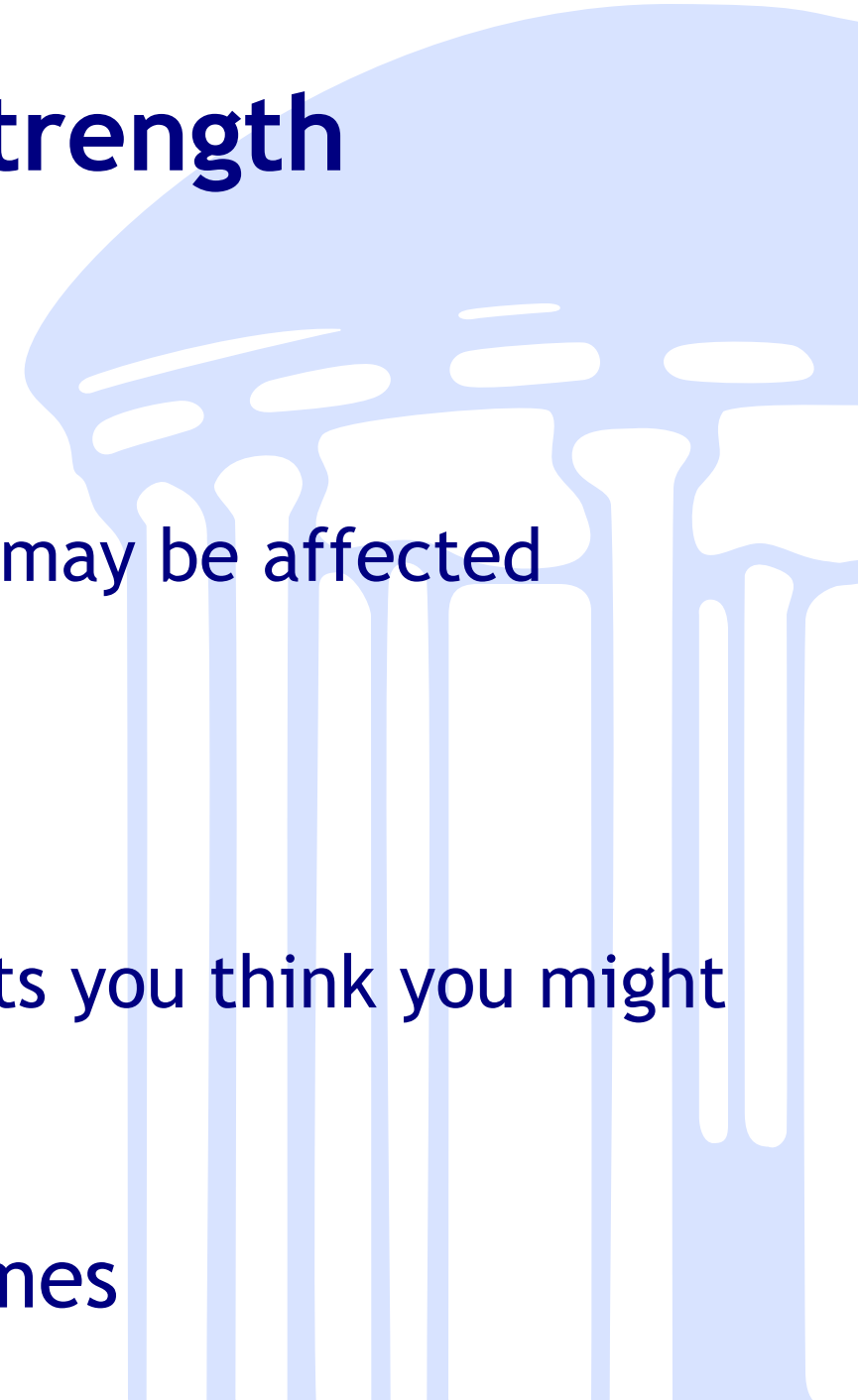
Observation

- Watch athlete closely throughout evaluation
 - Aphasia - difficulty finding or saying the right words
 - Obvious deformities/abnormal positions of body parts
 - Coordination (how they walk off the field, etc)
 - Pupillary signs: (PEARRL)
 - size
 - response to light
 - eye movement and tracking
 - Respirations
 - Overall demeanor

Palpation

- Additional info, can be gained through palpation once a baseline is established
 - Pulse
 - Blood Pressure
 - Palpate for signs of trauma:
 - Painful areas
 - Deformities
 - Swelling
 - Crepitus

ROM and Strength

- AROM and PROM
 - Check neck ROM
 - Any other ROM you think may be affected
 - Strength
 - Assess neck strength
 - Any other strength deficits you think you might observe
 - Dermatomes and Myotomes
- 

Stress Tests: Cognition

Cognitive functioning:

- 3 word recall
- Serial 7's
- Recite months of year in reverse order
- Recite days of week in reverse order
- Mental Status Assessment
- Neuropsychological Testing



Sideline mental status tests: SAC

- Orientation
- Immediate memory
- Exertional maneuvers
- Neurological screening
- Concentration
- Delayed recall
- Total score is computed (McCrea)

STANDARDIZED ASSESSMENT OF CONCUSSION - SAC		Form A	
NAME: _____			
TEAM: _____ EXAMINER: _____			
DATE OF EXAM: _____ TIME: _____			
EXAM/CASE ONE: BLIND INJURY POST-GAME			
DAY1 DAY2 DAY3 DAY5 DAY7 DAY90			
INTRODUCTION			
I am going to ask you some questions. Please listen carefully and give your best effort.			
ORIENTATION			
What Month is it? _____ / 0 1			
What's the Date today? _____ / 0 1			
What's the Day of Week? _____ / 0 1			
What Year is it? _____ / 0 1			
What Time is it right now? (write 1st) _____ / 0 1			
Award 1 point for each correct answer.			
ORIENTATION TOTAL SCORE §		<input type="text"/>	
IMMEDIATE MEMORY			
I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order.			
List	TRIAL 1	TRIAL 2	TRIAL 3
Banana	0 1	0 1	0 1
Apple	0 1	0 1	0 1
Cupcake	0 1	0 1	0 1
Banana	0 1	0 1	0 1
Banana	0 1	0 1	0 1
Total			
TRIAL 2 & 3: I am going to repeat that list again. Repeat back as many words as you can remember in any order, even if you said the word before.			
Complete at 3 trials regardless of score on trial 1 & 2. 1 pt. for each correct response. Total score equals sum across all trials.			
IMMEDIATE MEMORY TOTAL SCORE §		<input type="text"/>	
EXERTIONAL MANEUVERS			
If subject is not displaying or reporting symptoms, conduct the following maneuvers to create conditions under which symptoms likely to be elicited and detected. These maneuvers need not be conducted if a subject is already demonstrating or reporting any symptoms. If not conducted, allow 2 minutes to keep time delay constant before testing Delayed Recall. These methods should be administered for baseline testing of normal subjects.			
EXERTIONAL MANEUVERS			
5 Jumping Jacks	5 Push-Ups		
5 Sit-ups	5 Knee Bends		
NEUROLOGIC SCREENING			
Loss of Consciousness/ Witnessed Unresponsiveness <input type="checkbox"/> No Length: <input type="checkbox"/> Yes			
Post-Traumatic Annesia? <input type="checkbox"/> No Length: <input type="checkbox"/> Yes			
Retrospective Annesia? <input type="checkbox"/> No Length: <input type="checkbox"/> Yes			
Recall of pre-injury motor skills			
	Normal	Abnormal	
Strength:			
Right Upper Extremity	<input type="checkbox"/>	<input type="checkbox"/>	
Left Upper Extremity	<input type="checkbox"/>	<input type="checkbox"/>	
Right Lower Extremity	<input type="checkbox"/>	<input type="checkbox"/>	
Left Lower Extremity	<input type="checkbox"/>	<input type="checkbox"/>	
SENSATION - example:			
Face (touch/temperature)	<input type="checkbox"/>	<input type="checkbox"/>	
COORDINATION - example:			
Upper Limb (Finger-to-Nose)	<input type="checkbox"/>	<input type="checkbox"/>	
CONCENTRATION			
Digit Backward: I am going to read you a string of numbers and when I am done, you repeat them back to me backwards, in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.			
If correct, go to next string length. If incorrect, read trial 2. 1 pt. possible for each string length. Stop after incorrect on both trials.			
4-8-3	8-3-4	0 1	
3-4-1-4	4-3-7-6	0 1	
8-3-9-7-1	1-3-2-4-6	0 1	
7-1-3-4-6-2	2-3-9-1-4-8	0 1	
Months in Reverse Order: Now tell me the months of the year in reverse order. Start with the last month and go backward. Be you'll say December, November...Go ahead. 1 pt. for each sequence correct.			
Dec Nov Oct Sept Aug Jul June May Apr Mar Feb Jan		0 1	
CONCENTRATION TOTAL SCORE §		<input type="text"/>	
DELAYED RECALL			
Do you remember that list of words I read a few times earlier? Tell me as many words from the list as you can remember in any order. Circle each word correctly recalled. Total score equals number of words recalled.			
BANA APPLE CUPCAKE BANANA BANANA			
DELAYED RECALL TOTAL SCORE §		<input type="text"/>	
SAC SCORES SUMMARY			
Behavioral Measures & Neurologic Screening are reported for this month, but not incorporated into SAC Total Score.			
ORIENTATION		/ 5	
IMMEDIATE MEMORY		/ 15	
CONCENTRATION		/ 5	
DELAYED RECALL		/ 5	
SAC TOTAL SCORE §		/ 30	

SCAT2 - Serial evaluations

Tool	Test domain	Time	Score			
		Date tested				
		Days post injury				
SCAT2	Symptom score					
	Physical signs score					
	Glasgow Coma score (E + V + M)					
	Balance examination score					
	Coordination score					
	SAC	Orientation score				
Immediate memory score						
Concentration score						
Delayed recall score						
SAC Score						
Total	SCAT2					
Symptom severity score (max possible 132)						
Return to play			<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

SCAT2 - Concussion injury advice

Concussion injury advice (To be given to concussed athlete)

This patient has received an injury to the head. A careful medical examination has been carried out and no sign of any serious complications has been found. It is expected that recovery will be rapid, but the patient will need monitoring for a further period by a responsible adult. Your treating physician will provide guidance as to this timeframe.

If you notice any change in behaviour, vomiting, dizziness, worsening headache, double vision or excessive drowsiness, please telephone the clinic or the nearest hospital emergency department immediately.

Other important points:

- Rest and avoid strenuous activity for at least 24 hours
- No alcohol
- No sleeping tablets
- Use paracetamol or codeine for headache. Do not use aspirin or anti-inflammatory medication
- Do not drive until medically cleared
- Do not train or play sport until medically cleared

Clinic phone number

Patient's name

Date/time of injury

Date/time of medical review

Treating physician

Contact details or stamp

Neuropsychological Testing

- Assess cognitive factors such as memory, concentration, impulse control, and reaction time
- Paper and pencil tests:
 - Good: a lot of normative data exists
 - Bad: time-consuming (manpower and actual testing); and inability to assess reaction time
- Computerized NP tests:
 - Good:
 - Neuropsychologists not needed for test administration
 - Test multiple subjects at once
 - Reaction time can be assessed
 - Bad: reliability, sensitivity, and validity have been questioned (Randolph et al. 2005; Broglio et al. 2009)

Managing Functional Academic Deficits

Neuropsychological Deficit	Functional School Problem	Management Strategy
Attention/ Concentration	Short focus on lecture, classwork, homework	Shorter assignments, break down tasks, lighter work load
“Working” Memory	Holding instructions in mind, reading comprehension, math calculation, writing	Repetition, written instructions, use of calculator, short reading passages
Memory Consolidation/ Retrieval	Retaining new information, accessing learned info when needed	Smaller chunks to learn, recognition cues
Processing Speed	Keep pace with work demand, process verbal information effectively	Extended time, slow down verbal info, comprehension-checking
Fatigue	Decreased arousal/ activation to engage basic attention, working memory	Rest breaks

ANAM - Automated
Neuropsychological Assessment Metrics

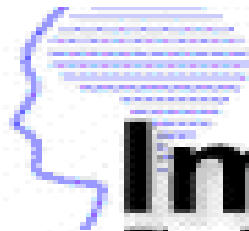
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The science and technology of neurocognitive assessment.

HEADMINDER™



ImPACT®

Fact or Fallacy?

NP green light means “Go”

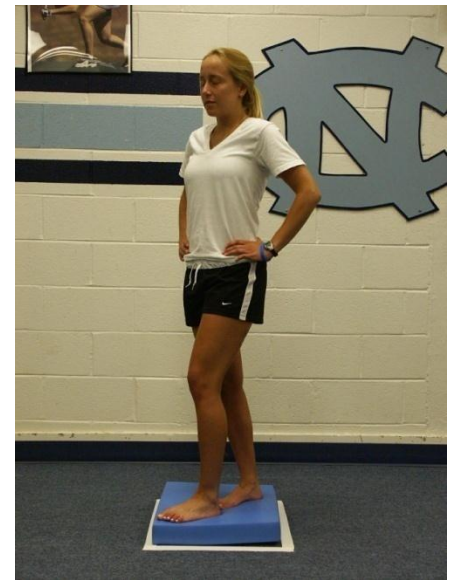
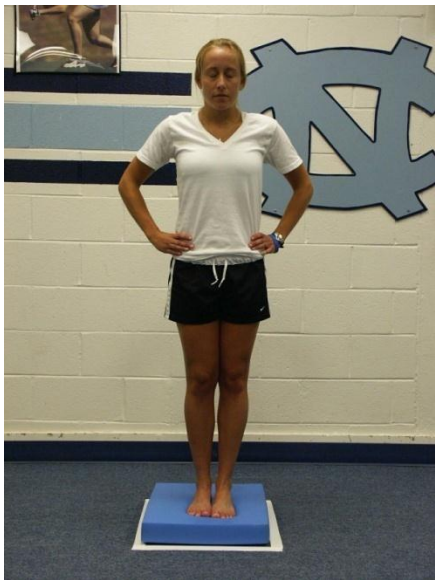
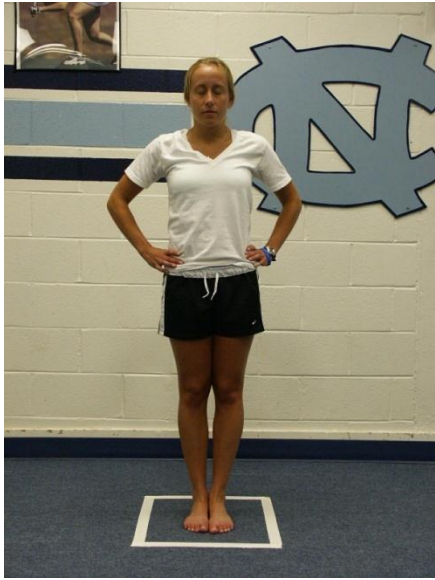


Stress Tests: Balance/Coordination

Balance Error Scoring System (BESS)

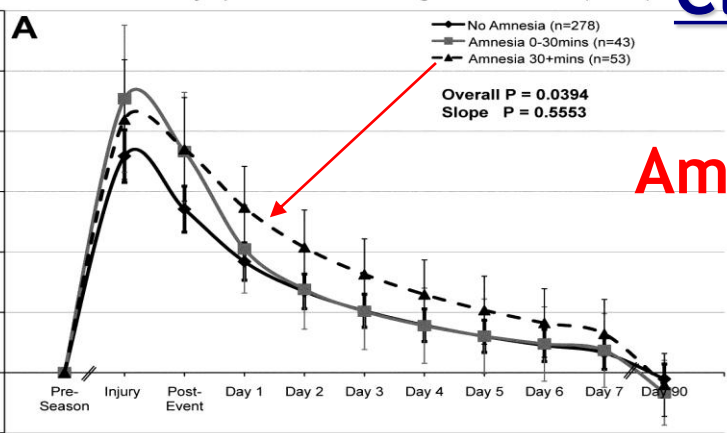
- Clinical test battery:
 - 6 20-second trials
 - Uses 3 different stances (double, single, tandem)
 - 2 different surfaces (firm, foam)
 - All performed with eyes closed
- Recorded errors:
 - Hands lifting off iliac crests
 - Opening eyes
 - Step, stumble, or fall
 - Moving into $>30^\circ$ of hip flexion or abduction
 - Remaining out of test position for >5 sec.
 - Lifts toes or heel off the floor or foam

Balance Error Scoring System (BESS)



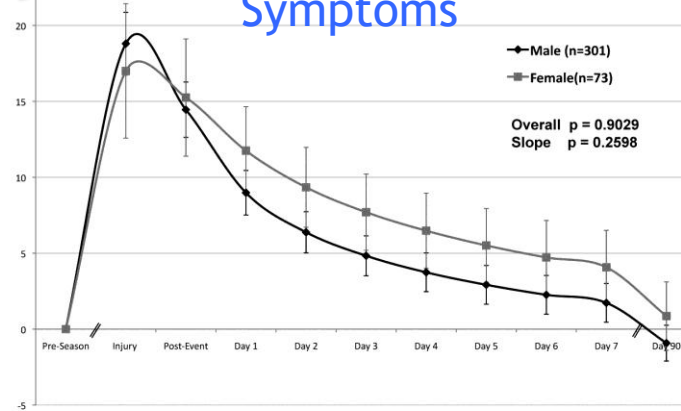
Clinical Recovery

Graded Symptom Checklist Change from Baseline (n=374)



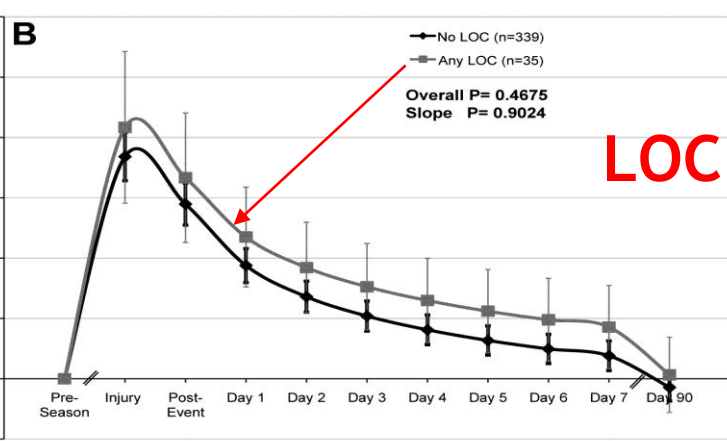
Amnesia

Symptoms



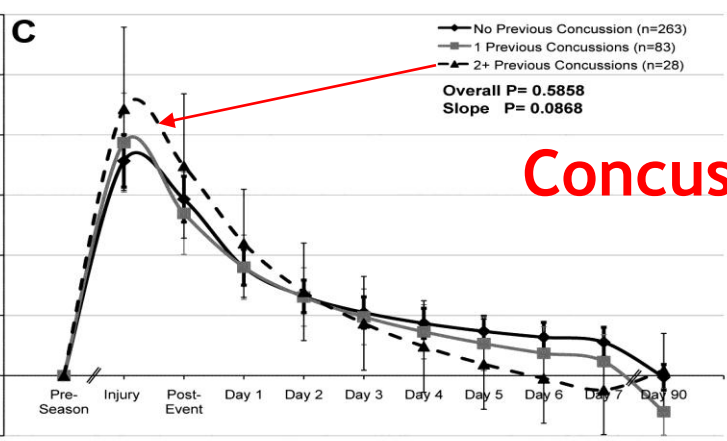
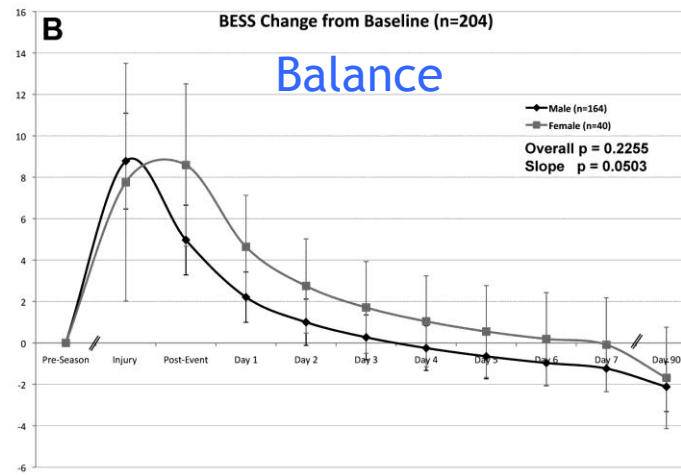
Sex

Balance



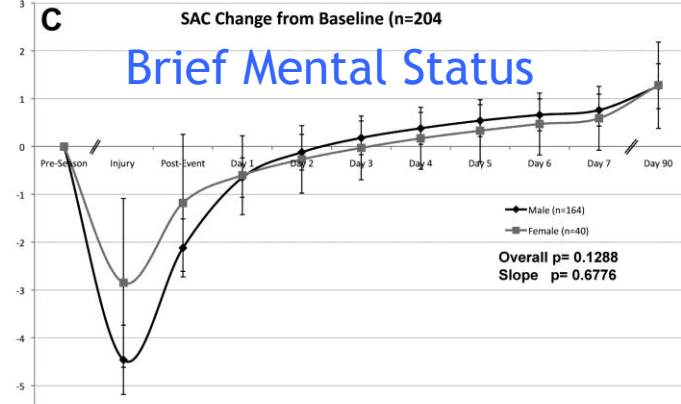
LOC

BESS Change from Baseline (n=204)



Concussion Hx

SAC Change from Baseline (n=204)



Brief Mental Status

Serial Evaluations

T0: clinical eval & symptom checklist

1-3 hrs: symptom checklist

24 hrs: follow-up clinical eval & symptom checklist

Symptomatic



1. Continued rest
2. Monitoring of s/s
3. If deteriorating – consider imaging

Asymptomatic



1. Neuropsychological testing
2. Postural stability testing
3. Monitoring of s/s

Serial Evaluations (con't)

Once athlete has been asymptomatic for 24 hrs:

- Reassess on clinical measures and compare to baseline scores.
- Continue to monitor symptoms for 24 hrs after assessment.
- If remain asymptomatic, reassess on clinical measures to see where they are relative to baseline and to previous day.
- Start ***Graduated RTP Progression*** if:
 - * *100% baseline* achieved
 - * no deterioration from previous day

5 Step Graduated Return to Play

- ***Exertion Step 1:*** 20 minute stationary bike ride (10-14 MPH)
- ***Exertion Step 2:*** Interval bike ride: 30 sec sprint (18-20 MPH/10-14 MPH)/30 sec recovery x 10; and BW circuit: Squats/Push Ups/Situps x 20 sec x 3
- ***Exertion Step 3:*** 60 yard shuttle run x 10 (40 sec rest); and plyometric workout: 10 yard bounding/10 medicine ball throws/10 vertical jumps x 3; and non-contact, sports-specific drills for approximately 15 minutes
- ***Exertion Step 4:*** Limited, controlled return to non-contact practice
- ***Exertion 5:*** Full sport participation in a practice

Working through the RTP Progression

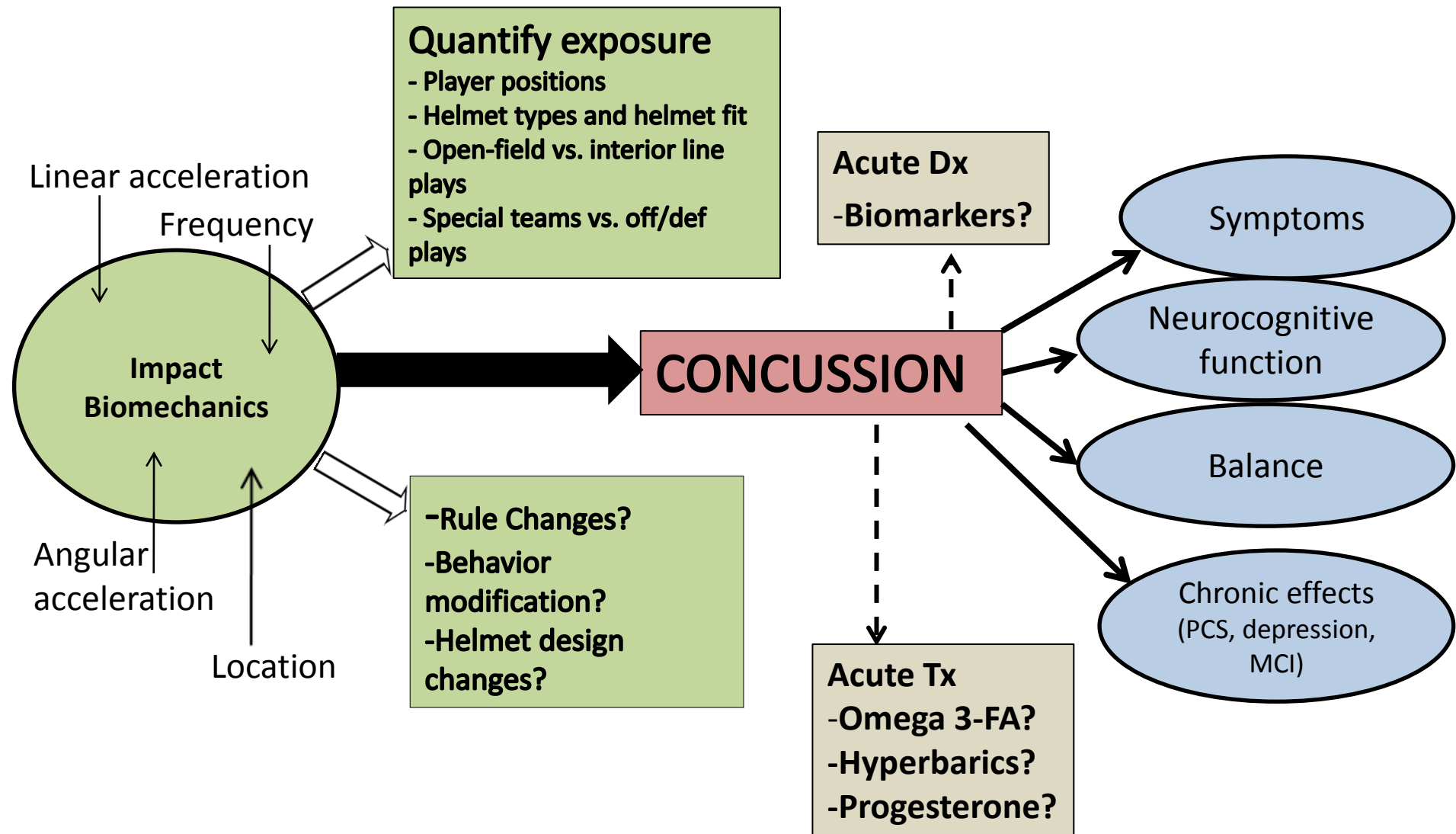
- The *5 steps* do not necessarily require *5 days*.
- No more than 2 steps should be performed on the same day, which allows for monitoring of both acute symptoms (during the activity) and delayed symptoms (within 24 hrs after the activity).
 - In general, If the exertional activities do not produce acute symptoms, the athlete may progress to the next step.
- The athlete may advance to Step 5 and return to full participation once they have remained asymptomatic for 24 hrs following Step 4 of the protocol.
- Always document the process, day by day, step by step!

Impact Biomechanics: Acceleration/ Deceleration

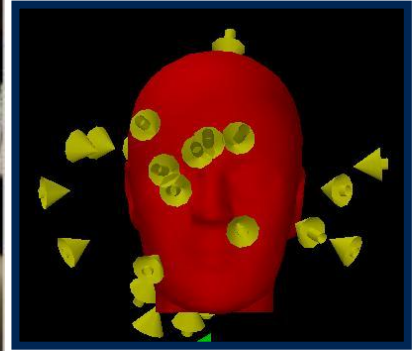


Biggest challenge: How do we manage the energy to prevent both concussion and severe TBI?

The Concussion Equation



Safer Football, Taught From Inside the Helmet



UNC athletic trainer Scott Trulock and Dr. Kevin Guskiewicz talking with Offensive Linemen Alan Pelc.

By ALAN SCHWARZ **Published: November 5, 2010** *New York Times*

CHAPEL HILL, N.C. — Alan Pelc has been taught how to block since his Houston boyhood, how to push and pulverize and punish oncoming defenders on the football field. This was different. He was learning how not to punish himself.

“Right there,” Dr. Kevin Guskiewicz said, pointing at a presentation screen showing more than a dozen arrows pointed straight into the top of a mannequin head. “These are all your recorded hits to the top of your helmet against L.S.U. Every time you drop your head. These are the ones we’re concerned about.”



NFL
NETWORK

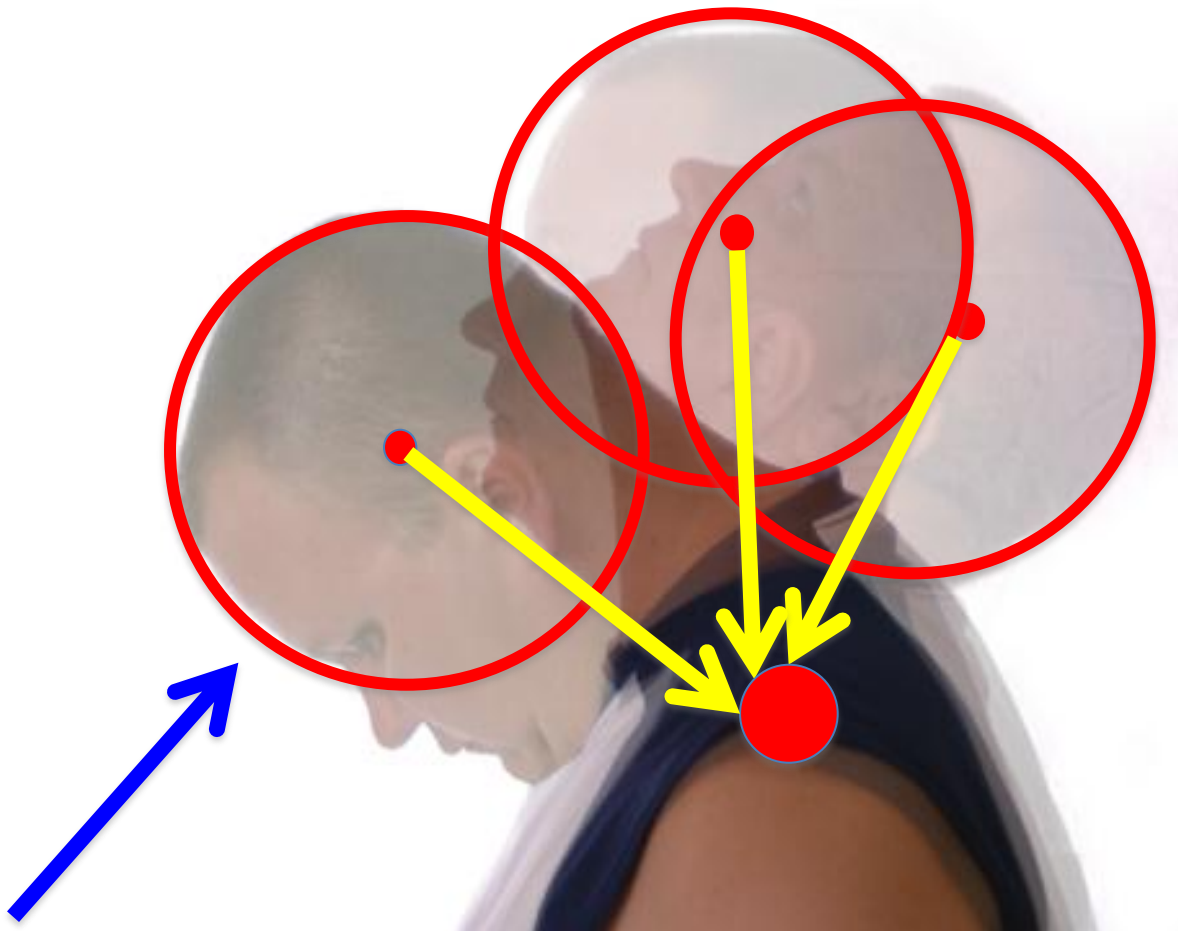
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GIFULMINATION.COM

Role of the cervical muscles?

67% ↑ in effective mass

Vianno, 2007





"All the News
That's Fit to Print"

The New York Times

National Edition

VOL. CLVI . . . No. 54,068

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SATURDAY, SEPTEMBER 15, 2007



TODD HEISLER/THE NEW YORK TIMES

Kelby Jasmon, left, like many high school teammates, said he would not tell his coach if he thought he had a concussion.

High School Players Shrug Off Concussions, Raising Risks

By ALAN SCHWARZ

To Kelby Jasmon, there was only one answer. The question: If he received yet another concussion this football season, while playing offensive and defensive line for his high school in Springfield, Ill., would he tell

thing with the same certainty: They did not quite know what a concussion was, and would never tell their coaches if they believed they had sustained one.

Matt Selvaggio, who plays with Jasmon on both lines, said: "Our coaches would

The National Football League has recently faced questions about its handling of concussions after four former players were found to have significant brain damage as early as their mid-30s. But teenagers are more susceptible to immediate harm from

Fed's Ex-Chief Attacks Bush On Fiscal Role

G.O.P. Lost Principles,
Greenspan Writes

By EDMUND L. ANDREWS
and DAVID E. SANGER

WASHINGTON, Sept. 14 — Alan Greenspan, in a long-awaited memoir that reviews his nearly two decades as chairman of the Federal Reserve, paints a highly critical portrait of how, he says, President Bush, Vice President Dick Cheney and the Republican-controlled Congress abandoned their party's principles on spending and deficits.

In the 500-page book, "The Age of Turbulence: Adventures in a New World," Mr. Greenspan describes the Bush administration as so captive to its own political operation that it paid little attention to fiscal discipline, and he described Mr. Bush's first two Treasury secretaries, Paul H. O'Neill and John W. Snow, as essentially powerless.

Mr. Bush, he writes, was never willing to contain spending or veto bills that drove the country into deeper and deeper deficits, as Congress abandoned rules that required that the cost of tax cuts be offset by savings elsewhere. "The Republicans in Congress lost their way," writes Mr. Greenspan, a self-described "libertarian Republican."

DEMOCRATS PUSH A TACTIC TO SHIFT IRAQ WAR POLICY

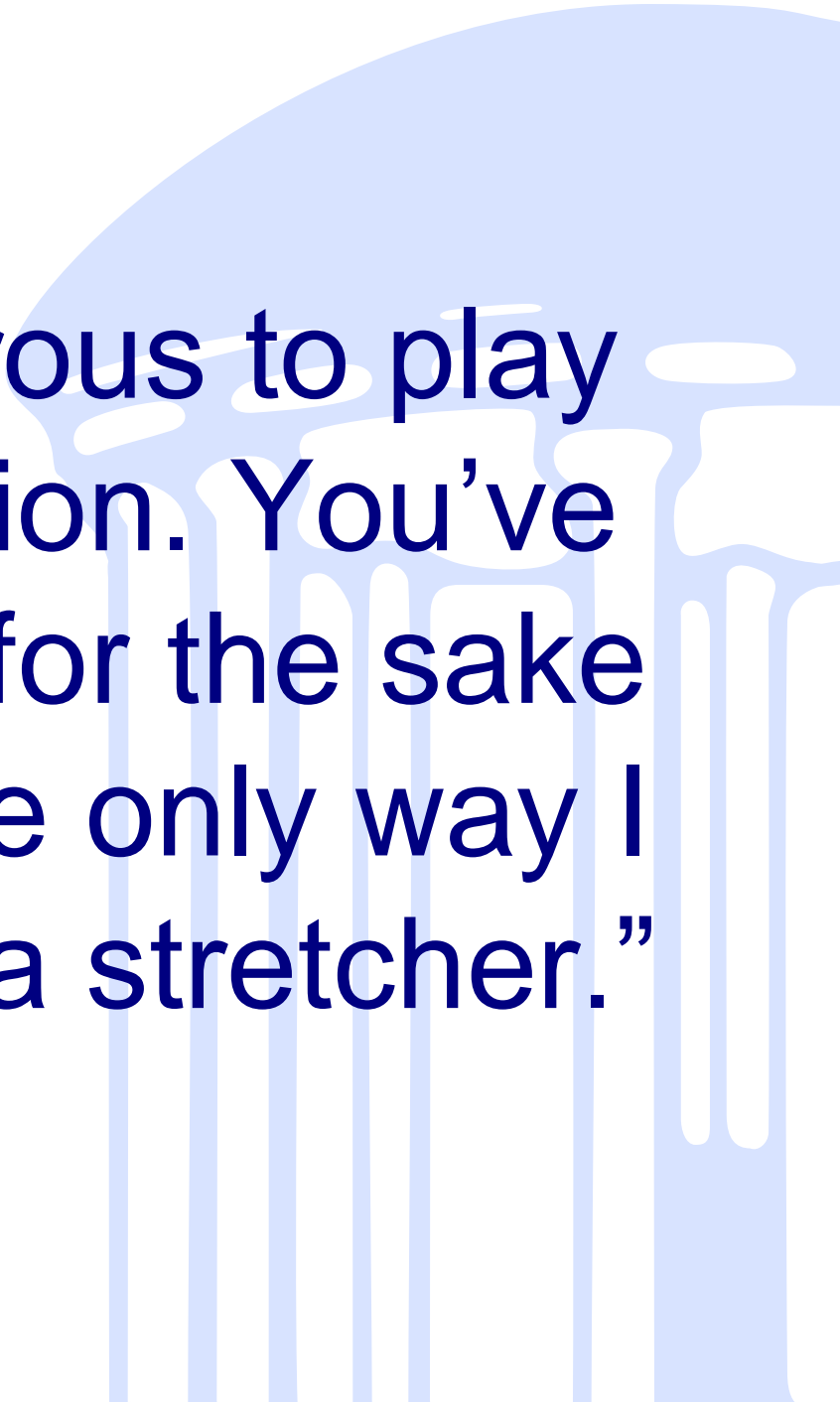
MORE TIME OFF FOR G.I.'S

Senators' Ultimate Goal
Is to Force Faster
Troop Pullout

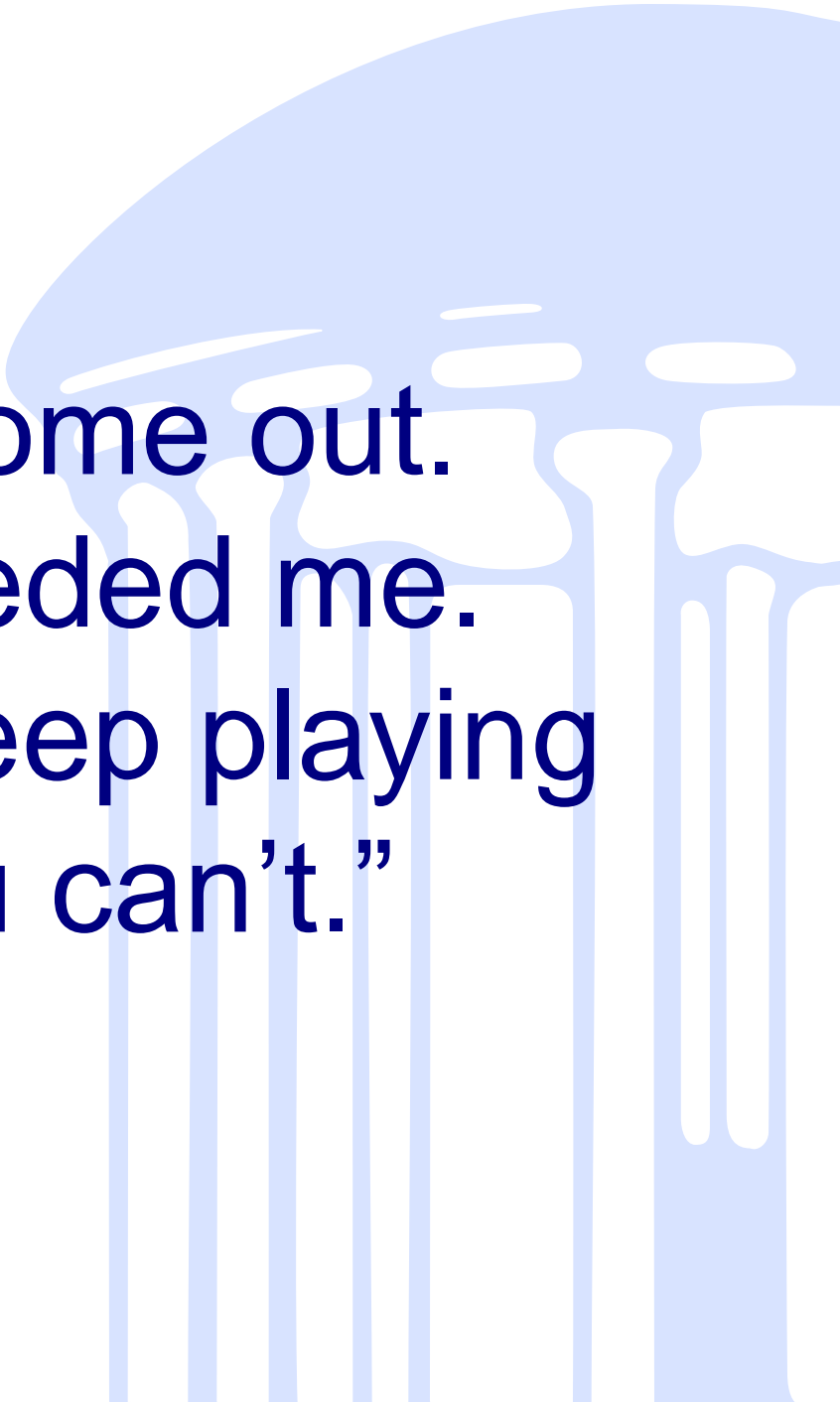
By DAVID M. HERSZENHORN
and DAVID S. CLOUD

WASHINGTON, Sept. 14 — Now that President Bush and Gen. David H. Petraeus have charted their course for the Iraq war, Democrats in the Senate say one of their proposals aimed at shifting the president's strategy is finally close to winning enough Republican support for a real chance at being approved. It would require that troops spend as much time at home as on their most recent tours overseas before being redeployed.

The proposal, by Senator Jim Webb, Democrat of Virginia, has strong support from top Democrats, who say that the practical effect would be to add time between deployments and force General Petraeus to withdraw troops on a substantially swifter timeline than the one he laid out before Congress this week, and that it would protect troops from



“It’s not dangerous to play with a concussion. You’ve got to sacrifice for the sake of the team. The only way I come out is on a stretcher.”



**“I couldn’t come out.
My team needed me.
You have to keep playing
— until you can’t.”**

WHAT CAN HAPPEN?

- Permanent brain injury
- Death (Second Impact Synd.)
- Out of school for months
- Never play sports again

(don't believe it?...)

Youth Sports & Concussion Laws

October 12, 2006

- Zackery Lystedt is 13 years old; middle school football.
- Play #32. Just three plays before halftime.
- No L.O.C.
- Official time-out and Zackery is removed.
- Zackery returned at start of 3rd quarter.
- Zackery plays 3rd and 4th quarters.
- Zackery collapses at end of game on field in dad's arms.

Courtesy of Stanley Herring, M.D.

Youth Sports & Concussion Laws

Why was/is the Zackery Lystedt Law needed?

Assessing education's impact:

- No “stickiness” to education alone.
- Attempts at policy changes are slow and inconsistent.
- Attempts at implementation of standards are slow and inconsistent.
- A + B + C = Patchwork of policies and procedures from one school district/sport organization to the next.

Courtesy of Stanley Herring, M.D.

Youth Sports & Concussion Laws



Sports Concussion Legislation

- Essential components
 - Education (athletes, parents, coaches).
 - Instituting a concussion policy and emergency action plan.
 - Removal from practice or play at the time of suspected concussion.
 - Medical evaluation and return to play clearance by a health care provider with training in concussion management.

States with Legislation Addressing Youth Sports-Related Concussions **March 2009**



NONE!

Football player dies after hit

THE ASSOCIATED PRESS

WINSTON-SALEM — A 15-year-old high school football player died early Sunday from a brain injury he suffered during the season-opening game, officials said.

Matt Gfeller was playing for Reynolds High School in Winston-Salem when he was injured in Friday night's game against Page High School of Greensboro.

The sophomore linebacker had been on life support at Wake Forest University Baptist Medical Center and underwent brain surgery late Friday.

Reynolds coach Mike Propst said Gfeller was taken off life support Saturday night and died about five hours later at 2:15 a.m. Sunday. A hospital spokeswoman said it would provide no additional information.

This was Gfeller's first year at Reynolds.

Assistant coach James Alexander said Gfeller was hit on the first play of the game nearly the same way he was hit on the play in which he was injured.

"It's the type of hit that occurs once or twice a year around the world," Paschal said.

Propst, school administrators and two pastors from local churches met with the 33 varsity players to help deal with Gfeller's death.

High school football player's death ruled accidental

By Tim Candon, HighSchoolOT.com editor

Posted: Today at 12:17 a.m.

Updated: Today at 8:05 a.m.

GREENVILLE, N.C. — state medical examiner in Greenville ruled Tuesday that the death of a Greenville Rose football player was accidental and the result of "second impact syndrome."

In a statement, Dr. M.G.F. Gilliland said Jaquan Waller died because of a "very rare condition which can occur when two relatively minor head injuries occur in a short time interval. It usually occurs in young athletes and is very rapidly fatal."

Waller, a junior running back, left the field after being tackled in Rose's game Friday against Wilmington Hoggard. He then collapsed on the sideline. Waller was taken to Pitt County Memorial Hospital, where he was placed on life support. He died Saturday morning. Waller had been hit in practice two days before the game and suffered a mild concussion.



Jaquan Waller

Related Stories

- N.C. high school football player dies after game

Site Search

Enter keyword(s)

Search

Became law in NC on June 16, 2011



Matthew Gfeller, Age 15

Reynolds High School, Forsyth County, North Carolina

23 Aug 2008 : Single Severe Traumatic Brain Injury
in Secondary School Football Game
Transported to Hospital

24 Aug 2008 : Surgical Repair Unsuccessful
Removed from Life Support

→ *Difficult to Prevent this Fatality*



Jaquan Waller, Age 16

Rose High School, Pitt County, North Carolina

17 Sept 2008 : Concussion in School Football Practice

19 Sept 2008 : Second Impact in School Football Game
Transported to Hospital

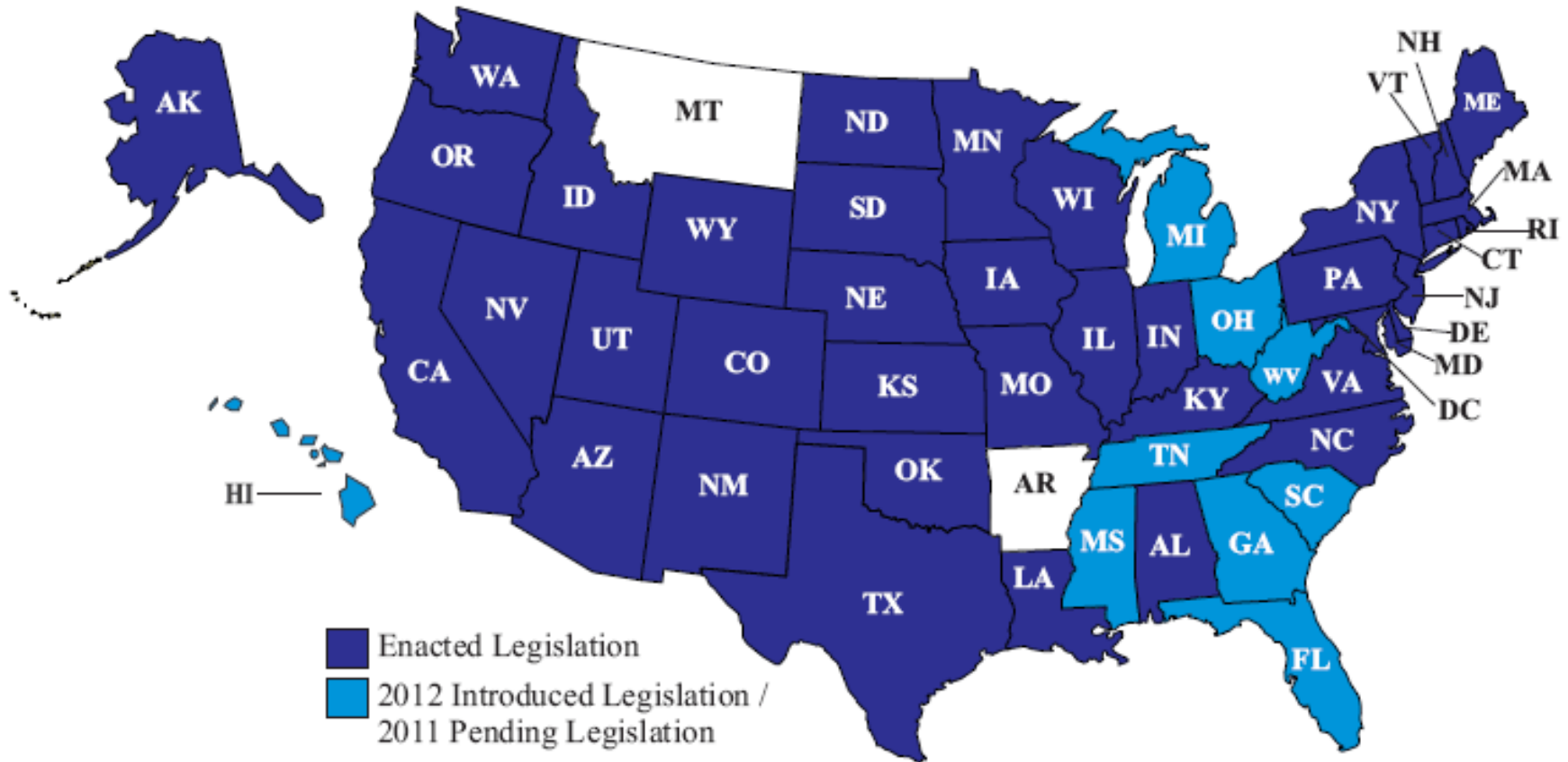
20 Sept 2008 : Died from Severe Swelling of Brain
Second Impact Syndrome – Med. Examiner

→ *Very Preventable Fatality*

→ *Should not have been Playing while Injured*



States with Legislation Addressing Youth Sports-Related Concussions **July 2012**



34 State Laws Passed

14 State Laws Pending

Source: National Conference of State Legislatures (www.ncsl.org)

CONCUSSION

A FACT SHEET FOR STUDENT-ATHLETES

WHAT IS A CONCUSSION?

A concussion is a brain injury that:

- Is caused by a blow to the head or body:
 - From contact with another player, hitting a hard surface such as the ground, ice or floor, or being hit by a piece of equipment such as a bat, lacrosse stick or field hockey ball.
- Can change the way your brain normally works.
- Can range from mild to severe.
- Presents itself differently for each athlete.
- Can occur during practice or competition in ANY sport.
- Can happen even if you do not lose consciousness.

HOW CAN I PREVENT A CONCUSSION?

Basic steps you can take to protect yourself from concussion:

- Do not initiate contact with your head or helmet. You can still get a concussion if you are wearing a helmet.
- Avoid striking an opponent in the head. Undercutting, flying elbows, stepping on a head, checking an unprotected opponent, and sticks to the head all cause concussions.
- Follow your athletics department's rules for safety and the rules of the sport.
- Practice good sportsmanship at all times.
- Practice and perfect the skills of the sport.

WHAT ARE THE SYMPTOMS OF A CONCUSSION?

You can't see a concussion, but you might notice some of the symptoms right away. Other symptoms can show up hours or days after the injury. Concussion symptoms include:

- Amnesia.
- Confusion.
- Headache.
- Loss of consciousness.
- Balance problems or dizziness.
- Double or fuzzy vision.
- Sensitivity to light or noise.
- Nausea (feeling that you might vomit).
- Feeling sluggish, foggy or groggy.
- Feeling unusually irritable.
- Concentration or memory problems (forgetting game plays, facts, meeting times).
- Slowed reaction time.

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

WHAT SHOULD I DO IF I THINK I HAVE A CONCUSSION?

Don't hide it. Tell your athletic trainer and coach. Never ignore a blow to the head. Also, tell your athletic trainer and coach if one of your teammates might have a concussion. Sports have injury timeouts and player substitutions so that you can get checked out.

Report it. Do not return to participation in a game, practice or other activity with symptoms. The sooner you get checked out, the sooner you may be able to return to play.

Get checked out. Your team physician, athletic trainer, or health care professional can tell you if you have had a concussion and when you are cleared to return to play. A concussion can affect your ability to perform everyday activities, your reaction time, balance, sleep and classroom performance.

Take time to recover. If you have had a concussion, your brain needs time to heal. While your brain is still healing, you are much more likely to have a repeat concussion. In rare cases, repeat concussions can cause permanent brain damage, and even death. Severe brain injury can change your whole life.



IT'S BETTER TO MISS ONE GAME THAN THE WHOLE SEASON. WHEN IN DOUBT, GET CHECKED OUT.

For more information and resources, visit www.NCAA.org/health-safety and www.CDC.gov/Concussion.



Reference to any commercial entity or product or service on this page should not be construed as an endorsement by the Government of the company or its products or services.



CONCUSSION

A Must Read for NFL Players
Let's take Head Injuries Out of Play



What is a Concussion?

A *brain injury* that can occur in any sport and alters the way your brain functions.

Can occur after a blow to the head/body following

- contact with another player, including helmet to helmet contact
- contact with the ground or another object

Most concussions occur without being knocked out (loss of consciousness)

Severity of injury depends on many factors and may not be known until symptoms resolve and brain function is back to normal

Concussions are not created equal; each player is different, each injury is different and all injuries should be evaluated by your team medical staff

What Symptoms Occur in Concussion?

Different symptoms can occur and may not show up for several hours. Common symptoms include:

- | | |
|--|-------------------------------------|
| - Confusion | - Nausea |
| - Headache | - Feeling sluggish, foggy or groggy |
| - Amnesia / Difficulty remembering (forget plays, assignments) | - Sensitivity to noise/light |
| - Balance problems | - Double / fuzzy vision |
| - Irritability | - Slowed reaction time |
| - Dizziness | - Feeling more emotional |
| - Difficulty concentrating | - Loss of consciousness |

Symptoms may worsen with physical or cognitive exertion (e.g. lifting, computer use, reading)

Why Should I Report My Symptoms?

- Playing while still experiencing symptoms can prolong the time needed for recovery and return to play.
- Unlike other injuries, there may be significant consequences to "playing through" brain injury: Repetitive brain injury not treated promptly or properly may cause a permanent injury to your brain

What Should I Do If I Think I've Had a Concussion?

Report it. Never ignore symptoms even if they appear mild. Look out for your teammates as well. Tell your athletic trainer or team physician if you think you or a teammate has suffered a concussion.

Get Checked Out. Your team medical staff can determine if you've had a concussion and when it's safe to return to play. As players, you must trust your team medical staff to manage your injuries.

Take Care of Your Brain; It is Vital. Repetitive brain injury, especially when there is inadequate time to recover, may cause long-lasting damage including memory problems and even dementia, which can change your life and your family's life forever. **"Work Smart, Use your Head, Don't Lead with it"**

Be smart. Other athletes are watching...





GFELLER-WALLER LAW

EDUCATIONAL COMPONENTS

EAP & POSTCONCUSSION COMPONENTS

MEDICAL PROFESSIONALS

STAKEHOLDER ORGANIZATIONS

Gfeller-Waller Concussion Awareness Act

Implications and Considerations for Schools

Overview

The Gfeller-Waller Concussion Awareness Act was drafted and implemented to protect the safety of student-athletes in North Carolina and was signed into law on June 16, 2011 by Governor Beverly Purdue. There are three major areas of focus in the law and these include: education, emergency action and postconcussion protocol implementation, and clearance/return to play or practice following concussion. A copy of the Gfeller-Waller Concussion Awareness Act is available here ([PDF - 74 kb](#)). Each school should maintain documentation that they are in compliance with the law.

This web site contains information and materials to be used by high schools and middle schools and medical professionals to comply with the law. At the top of the page are links for each major requirement stated in the law. This website includes forms, materials, and examples for schools to enable them to implement these changes into their schools or practices.

The **Gfeller-Waller Concussion Awareness Act Resource Packet** (item 10 below) contains a checklist to help guide your school through the compliance process. You can also read and print each of the individual items of the resource packet by clicking on the links at the top of this page. If you or someone at your school has questions about the Gfeller-Waller Concussion Awareness Act, please email gfellerwaller@unc.edu.

Below is a list of all Gfeller-Waller Concussion Awareness Act materials. Direct links to these materials for ease of reading and printing are also provided.

- 1) Gfeller-Waller Law Compliance Information and Checklist [PDF - 87 kb](#)
- 2) Student-Athlete & Parent/Legal Custodian Education & Statement Form [PDF - 160kb](#)
- 3) School Representative (parent/coach/volunteer/school nurse/first responder) Education & Statement Form [PDF - 155 kb](#)

Youth Sports Issues: Concussion


Whose Responsibility Is It?

ACSM
SCIENTIFIC
ROUNDTABLE

AMERICAN COLLEGE OF SPORTS MEDICINE CONFERENCE SERIES


**ACSM Roundtable:
Youth Sports Scheduling
– Children at Risk**


APRIL 16-18, 2008 • ATLANTA, GEORGIA
Chair: Michael Bergeron, Ph.D., FACSM




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- Athletes
- Parents
- Physicians
- Athletic Trainers
- Coaches
- Researchers
- Tournament/Event
Directors/Administrators
- Sport Governing Bodies
- State/Federal Policy

WHEN IN DOUBT - SIT THEM OUT!

No same day RTP

- Youth sports
- HS sports (NFSHSAA)
- College sports (NCAA)
- Pro sports (NFL, NHL)
- Elite/Olympic sports (Zurich Consensus/IOC)



Conclusions

A culture shift has been set in motion... but we have a long way to go.

- Concussion education is key.
- Establish an objective evaluation & standardized RTP protocol (graduated exertional exercises).
- Know “red flags” for a situation turning catastrophic and have an EAP.
- Think beyond the acute trauma
- Equipment safety & behavior modification
- State laws will make a difference!



play it safe

Matthew Gfeller
Sport-Related TBI Research Center

The University of North Carolina at Chapel Hill

Thank You

gus@email.unc.edu