

## Concussion in the Student-Athlete: What's New in 2011?


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## Objectives

Regarding concussions in the athlete the learner will know the current:


- Diagnosis, treatment and return to play standards
- How to create a management plan to help the student-athlete return to school activities
- Reasoning behind intervention (SIS/ PCS/ CTE)
- Virginia law protecting student-athletes



## Sports Concussion

The ritual begins in the sweltering heat of August with grueling, twice-a-day workouts and the sound of full-force collisions between pads and helmets echoing across the practice field. As the leaves begin to change, the annual rite of passage that is high school football takes center stage in communities across Virginia. For the fans, who faithfully gather every Friday night or Saturday afternoon, the bone-jarring hits generate unbridled excitement. But for the warriors, these high-speed, sledgehammer tackles carry the potential for a concussion, an injury that occurs when the brain is violently rocked back and forth inside the skull cavity.

-Anonymous





## What is a concussion?





## Concussion

- Complex pathophysiologic process affecting the brain, induced by traumatic biomechanical forces secondary to direct or indirect forces to the head that disrupts the function of the brain. (CDC 2007)
- Doesn't have to be a "hard" hit
- "Bell rung" or "A Ding"
- **BRAIN INJURY**

## Epidemiology of Sports-Related Concussion in the United States

- Approximately 3.8 million sports-related concussions occur each year
- Studies show concussion resulting in LOC account for only 10% of injuries





**CDC** **Concussion in Sports**

This palm card provides information and tools to help medical staff with the on-field recognition and management of concussion.

**Concussion Signs and Symptoms**

Signs Observed by Medical Staff	Symptoms Reported by Athlete
Appears dazed or stunned	Headache or "pressure" in head
Is confused about assignment	Nausea
Forgets sports plays	Balance problems or "dizziness"
Is unsure of game, score, opponent	Double or fuzzy vision
Moves clumsily	Sensitivity to light
Answers questions slowly	Sensitivity to noise
Loses consciousness (even briefly)	Feeling sluggish or slowed down
Shows behavior or personality changes	Feeling foggy or groggy
Can't recall events prior to hit or fall (retrograde amnesia)	Does not "feel right"
Can't recall events after hit or fall (anterograde amnesia)	

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**Tip #1**

- Don't assume that if an athlete did not lose consciousness they do not have a concussion

**"IF IN DOUBT, SIT THEM OUT"**

**Consensus Statement on Concussion in Sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008**

*W. Mecklenburg, F. E. Johnson, P. M. Banks, M. Aubry, M. Meehan, P. Clark*

**PEDIATRICS**  
OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

**Sport-Related Concussions in Children and Adolescents**  
Mark E. Halstead, Kevin D. Walter and The Council on Sports Medicine and Fitness  
Pediatrics 2010;126:997-1015, originally published online Aug 30, 2010; DOI: 10.1542/peds.2010-2009

The online version of this article, along with updated information and services, is located on the World Wide Web at: <http://www.pediatrics.org/cgi/content/full/126/5/997>

Grading Scales of Concussions

**NO MORE GRADES**

10. Ommaya & ...  
11. Ommaya & ...  
12. Torg  
13. Gersoff

## Follow-Up Evaluation

Evaluation should occur during acute period of injury

- Clinical Interview (signs and symptoms)
- Neurologic exam
- Balance
- Neuropsychologic exam (i.e. ImPACT)

## What do we see on X-ray, CT, MRI with concussion?

## Neuropsychological Testing: What is it?

One tool in a toolbox

## Neuropsychologic Findings

- Disturbances of :
  - new learning
  - memory
  - attention
  - information processing speed
  - reaction time


## What is it not?

An instrument to be used by anyone not trained in its interpretation OR without any other evaluation



## The Team

- Athletic Trainer
- Physician (PCP and ED)
- Athlete and Parent
- School Personnel
- Sports Medicine Physician
- Neuropsychologist
- Neurologist
- Neurosurgeon



ORIGINAL RESEARCH

### A Preliminary Study of Subsymptom Threshold Exercise Training for Refractory Post-Concussion Syndrome

*John J. Laddy, MD,\*† Karl Kuczkowski, PhD,‡ James P. Donnelly, PhD,§ David R. Pendergast, EdD,¶ Leonard H. Epstein, PhD,‡ and Barry Wilke, PhD\*\**

**Objective:** To evaluate the safety and effectiveness of subsymptom threshold exercise training for the treatment of post-concussion syndrome (PCS).

**Design:** Prospective case series.

**Setting:** University Sports Medicine Concussion Clinic.


**Participants:** Twelve refractory patients with PCS (8 athletes and 4 nonathletes).

**Intervention:** Threshold test to symptom exacerbation threshold.

**Conclusions:** Treatment with controlled exercise is a safe program that appears to improve PCS symptoms when compared with a no-treatment baseline. A randomized controlled study is warranted.

**Key Words:** traumatic brain injury, motion, symptoms, physiology, head trauma.

*J Sport Med 2010;21: 275*





He's seeing stars.  
When can he safely return to being a star?

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## Return to Play Criteria

- No signs or symptoms
- Normal neurological exam
- Normal balance
- Neuropsychological exam back to baseline
- **And then...** return to play progression



## Return to Play Progression

No activity

↓

Light aerobic exercise

↓

Sport specific exercise

↓

Non-contact training drills

↓

Full-contact practice

↓


Return to Play (Game)

\*24 hr minimum at each stage



## Tip #2

- Do not clear an athlete to return to play until they are back to “baseline” in your office



### What are we trying to prevent?

- Post-Concussion Syndrome
- Second Impact Syndrome
- Chronic Traumatic Encephalopathy


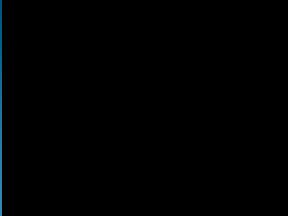


Healthy Brain




Damaged Brain  
(18 yr old)

### “Keeping Quiet Can Keep You Out of the Game”

### VA Senate Bill 652

- Sponsored by Senator R. Northam (M.D.)
- Testified February 2010
- Passed House and Senate March 2010
- Approved by Governor April 11, 2010 as Section 22.1-271.5 in Code of VA



### Code of Virginia Section 22.1-271.5 “Policies on concussions in student-athletes”

- Education of parent, athlete and coaches
  - Proof of education
- Discontinue play if suspect concussion
- Written clearance by license health care provider determined by BOE
- Licensed HCP may be a volunteer

Effective July 1, 2011

### Education

- BOE along with VHSL, DOH, CHKD, AAP, VATA develop and distribute to local school divisions guidelines on policies

### Policies to be developed by local school divisions

- Address academic needs and gradual reintroduction of cognitive demands


## Non-school sponsored athletics

- School divisions provide guidelines to organizations using school property
- NOT required to enforce compliance with policies



## Federal Bills

- ConTACT Act of 2009: Congressman Pascrell  
Require the Secretary of Health and Human Services to establish concussion management guidelines, including return to play standards.
- Protecting Student Athletes from Concussions Act (2010 and 2011): Congressmen Miller and Bishop



[www.CHKD.ORG/CONCUSSION](http://www.CHKD.ORG/CONCUSSION)



**CHKD Sports Concussion Program**

The CHKD Sports Concussion Program is the only comprehensive, multi-disciplinary sports concussion program in the region specifically for children, adolescents and young adults. The program is directed by pediatric and adolescent sports medicine physicians, has a regular season sports medicine physician, and a regular season sports medicine physician who works closely with local schools, high schools and colleges. In addition, we have applied all the national and state rules to help protect young athletes through proper education.

**The Regard's Practice Team:**  
The comprehensive, multi-disciplinary team includes pediatric and adolescent sports medicine physicians, pediatric neurologists, pediatric neuropsychologists, certified athletic trainers, sports generalists, neurophysiologists and pediatric ophthalmologists. Our providers collaborate with the specialists for example in sports concussions and brain injuries. They are able to handle both normal single sports injuries. Having a sports athlete suffer a sports concussion can be stressful. Because of our multidisciplinary team, we are able to evaluate, diagnose and manage all sports concussions in a unified team to help make the process easier for you.

**How will the CHKD Sports Concussion Program help me?**  
Using the latest medical knowledge, our team will provide an expert evaluation to:

1. Determine if your young athlete has a concussion.
2. Design an individualized treatment plan including collaboration with the school to provide the appropriate academic accommodations to insure recovery.
3. Design an individualized safe return to play plan.

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