



Long Term Effects of Concussion

**FCCSC and Indiana Athlete Concussion
Alliance**

Concussion

Management Project

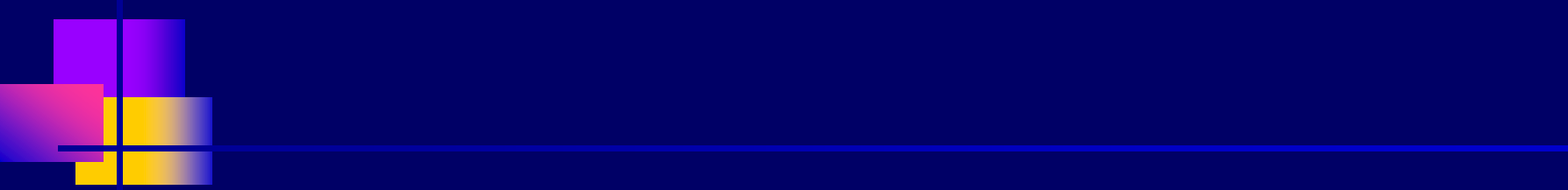
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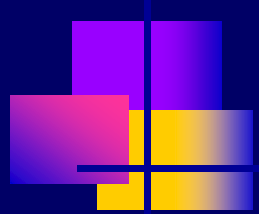


Possible Long Term Effects of Concussion

**NYSPHSAA and NYSAAA
Concussion
Management Project**



But how did I get involved in
better understanding the long term
effects of concussions?
(Mild Traumatic ***Brain injury***)
[MTBI])



And NO, I am NOT an expert;
just a very interested party, trying to get the word out.

FCCSC Mission Statement



- The Franklin County School Corporation, Administrators and the Indiana High School Athletic Association have partnered to educate interscholastic athletic personnel, secondary school athletes, parents of the athletes, school physicians and school nurses in current concussion management policies and procedures.



FCCSC Mission Statement

Recognizing the concussed athlete, applying the guidelines for appropriate reactions, understanding the dangers of inappropriate actions and following correct protocols for return to school and athletic play will be outcomes of this educational process. As a result, the number of Franklin county scholastic athletes suffering from “post concussion syndrome” or “secondary concussion syndrome” will significantly decrease.



What is a concussion (MTBI)?

- A disruption in normal brain function due to a blow or jolt to the head
 - *Centers for Disease Control*
- A trauma induced alteration in mental status that may or may not involve loss of consciousness
 - *American Academy of Neurology*
- Concussion = Mild traumatic brain injury (MTBI)

A concussion is a brain injury!!!



What is a concussion (MTBI)?

Rapid onset but (usually) a short lived
impairment

- Can be caused by a direct blow *or* jolt to the head
But one does not have to be hit their head!
- Different symptoms in each case
- Usually improves in 7-10 days – but timing different for each patient.

What should we do with regard to "Return to Play" Protocol

- **No RTP on the same day of injury!**
- **No RTP without Physician clearance!**
- **No Exceptions!**





What should we do with regard to "Return to Play" Protocol

- **Wednesday, 12/9/09 – USA Today: Steelers QB Ben Roethlisberger told the AP why a concussion kept him on the bench: *"You can get a knee replacement or a rotator-cuff operation, but you can't get a new brain"***



Concussion – Epidemiology

The Numbers

- **1.5 million brain injuries per year in the US ranging from mild to severe**
- **More than 1 million seek care in ED's**
- **90% of all injuries are mild (MTBI)**
- **650,000 children and adolescents each year with MTBI**
 - **90% with seemingly mild injuries**
 - **325,000 will have a CT scan**
 - **90% of these will have a negative CT**

Concussion – Epidemiology

The Numbers in Sports



- 20% (300,000) injuries sports related (may be much higher); 80% *not* sports related!!! (Car Accidents #1)
- Football, soccer, equestrian, baseball, and skiing most common sports in US.
- 25% high school football players sustain a head injury *each year*, 20% at some point *in their career*, 40% of college players
- Ice hockey (Canada) - 7% of hockey players will sustain a concussion in a single season of play

What should we do with regard to "Return to Play" Protocol

- 1. Physical/Mental Rest until asymptomatic; then a gradual (6 day) RTP.**
- 2. Light Aerobic Exercise (IE – stationary bike)**
- 3. Sport Specific Exercise**
- 4. Non-Contact Training Drills (IE – light resistance training)**
- 5. Full Contact Training after Receipt of Physician Clearance (MD trained in concussions)**
- 6. Return to Play**





When to Seek Medical Attention

- ***Anyone who has had a concussion (Brain injury [MTBI]) should see a trained physician and have a neurologic examination before they are allowed to return to play, resume work, drive, etc.***
- ***Anyone with a loss of consciousness should be seen that day.***

When to Seek Medical Attention



- **Anyone with an altered level of consciousness or focal exam (weakness, tingling, etc.) should be transported with full spinal immobilization.**
- **Anyone who has had a seizure should be transported by ambulance.**
- **Anyone with more than a brief LOC should be transported by ambulance.**

Initial Evaluation: Symptoms

Note severity or absence of...

- Headache
- Neck Pain
- Nausea
- Vision/hearing problems, feeling
- Difficulty concentrating/recalling
- Confused or dazed
- Drowsiness



Initial Evaluation: Memory

Ask 'leading' questions:

- How long were you unconscious?
- How bad does your head hurt?
- How nausea are you?
- Which half/quarter is it?
- What team are we playing?
- What venue are we in?
- Did we win the last game we played?

Questions can be modified to be sport specific





Initial Evaluation: Neurological Signs/Symptoms

- Slowed or slurred speech
- Erratic eye movement
- Unequal/ dilated/constricted pupils
- Awkward, uncoordinated gait
- Slow reaction time



Followed by an Evaluation of the Concussion (MTBI) in the ED or Doctor's Office



- **Unconscious or with a confirmed LOC.**
 - **ABC's**
 - **Assume neck injury**
 - **Neurosurgical consultation**
 - **Eye opening**
 - **Motor**
 - **Verbal**
- **Other indicators of mental status.**



What paper work should we do immediately following a 'MTBI'?

- A "Concussion System Checklist"
(Next two Slides)



Using the Section III developed Concussion Check List.

(To be utilized by trainer or coach)

Concussion Symptom Checklist

Name: _____ Age: _____

Grade: _____ Sport: _____

Date of injury: _____ Time of injury: _____

On Site Evaluation:

Description of Injury:

Using the Section III developed Concussion Check List.

Was there a loss of consciousness (LOC)?:	Yes	No	Unclear
Does he/she remember the injury?	Yes	No	Unclear
Does he/she have confusion after the injury?	Yes	No	Unclear

Symptoms observed at the time of injury:

Dizziness	Yes	No	Headache	Yes	No
Ringing in ears	Yes	No	Nausea/Vomiting	Yes	No
Drowsy/Sleepy	Yes	No	Fatigue/Low energy	Yes	No
"Don't feel right"	Yes	No	Feeling "Dazed"	Yes	No
Seizure	Yes	No	Poor balance/coord.	Yes	No
Memory problems	Yes	No	Loss of orientation	Yes	No
Blurred vision	Yes	No	Sensitivity to light	Yes	No
Vacant Stare and/or Glassy eyed				Yes	No

***Please circle yes or no for each system listed above.**

Other findings/comments:

Final action taken: Parents Notified Sent to Hospital Other:
(Developed by personnel in Section III) (*Back side is for physician*)

Second Impact Syndrome Senario

(A long term, very dangerous, problem)



- 16 y.o. player runs into line and is tackled.
- Gets up, returns to huddle; seems wobbly, lines up and collapses.
- Attempts to stand again but can't. Trainer and coach reach him; he is unresponsive.
- In retrospect had been tackled with helmet to helmet hit one week earlier.
- Had returned to play the same day when he reassured the trainer and coaches that he was fine.



Second Impact Syndrome

- This is rare *but* there are *several* cases per year in the U.S.
- Seems to be limited to young males from early teens to early twenties.
- Loss of cerebral autoregulation of vascular control (The brain is no longer able to control blood flow to it).
- Happens when return to play before completely healed and suffers a second, often seemingly mild blow to the head.
- **Prevention is the only treatment!**
(Go to CDC video – Brandon Schultz)

Post – Concussion Syndrome (PCS) (Another long term issue)

- The collection of physical, cognitive, and emotional symptoms that can persist for days, weeks, months, or indefinitely after a mild traumatic brain injury
- Roughly 5 - 15% of adults still have PCS symptoms one year after injury
- Less is known about the prevalence and duration of PCS in youth
- **Go to swimmer's video**



Concussion in Interscholastic Athletics: Summary

- **Second Impact Syndrome is a rare but *real* complication of re – injury if athletes return too soon.**
- **Post – concussion syndrome can have effects on academic as well as athletic performance.**
- **Concussion is an invisible injury and can affect the athlete’s self – esteem and social relationships.**



**“ImPACT”
as a
for Sports Concussion
Management TOOL**

Why Neuropsychological Testing?

- **Computerized tests**
 - **measure reaction time in milliseconds**
 - **can be repeated as often as necessary**
- ***Ideally*, baseline testing done in high risk sports to assist in return to play decisions**
 - **Test is repeated after concussion and results are compared to baseline**
- ***At a minimum*, should be used to assist in management of complex concussions**

What ImPACT Is:



- **it IS a useful concussion screening tool and management program.**
- **it IS validated with multiple published studies.**
- **it IS easy to administer. Sports teams use High School computer labs.**
- **it IS extremely useful in setting a pre-concussion neuro-cognitive baseline.**

What ImPACT Isn't:



- **it IS NOT a substitute for medical evaluation and treatment**
- **it IS NOT a substitute for comprehensive neuropsychological testing when needed**



ImPACT: Post-Concussion Evaluation

- **Demographics**
- **Concussion History Questionnaire**
- **Concussion Symptom Scale**
- **Neurocognitive Measures**
 - ✓ Memory, Working Memory, Attention,
 - ✓ Reaction Time, Mental Speed
- **Detailed Clinical Report**
 - ✓ Automatically Computer Scored

Concussions – Treatment



- **Return to play, school, work, etc.**
 - Not an ED or first day decision.
 - Symptoms may progress; tell patients this.
 - Thorough discharge instructions; insure good follow – up.
 - Clearance before return to play or work.
 - *Enforcement!*
 - If sx's persist > 7 -10 days referral to specialist.



Recovery from Concussion

- Full recovery in 7-10 days. . .in most cases
- Risk factors for slow or incomplete recovery
 - prior brain illness or injury (e.g., concussion)
 - learning disability
 - psychiatric disorder
- Psychological complications
 - depression or anxiety
 - loss of self-confidence
- A '*miserable minority*' will have long-term symptoms



Treatment Strategies

- **As prescribed by Medical Personnel**
- **No activity for 24 hours**
- **Use Medical Clearance RTP Protocol**



Concussion in the Classroom

- **Fatigue - tires easily in class and over the course of the day**
- **Headache and other symptoms worsen with reading or concentration**
- **Trouble doing more than one thing at a time (e.g., listening to the teacher and taking notes)**
- **Frequent visits to the nurse's office**

Concussion in the Classroom

- **Late or incomplete homework**
- **Easily overloaded and 'shuts down'**
- **Takes longer to read and learn**
- **Bothered by bright light in the classroom or noise in the cafeteria**
- **Emotional outbursts**
- **Lack of motivation**
- **(We need to protect them)**





Guidelines for Return to School after Concussion

- **Out of school at first if necessary ('cognitive rest'), and then gradual re-entry as tolerated**
- **Avoid re-injury especially in physical education class and in crowded hallways or stairwells**
- **Provide academic accommodations**
- **Communicate and Educate**
 - **Establish one person in school as liaison with parents and medical team**



Academic Accommodations

- **Rest breaks during school in a quiet location (not always the nurse's office)**
- **Reduced course and work load**
 - **Drop unnecessary classes**
 - **Decrease homework**
- **Avoid over-stimulation, (e.g., cafeteria or noisy hallways)**

'Concussion in the Classroom' brochure available at upstate.edu/concussion



Principles of Concussion Treatment

- **No cure for concussion, but treatment can help the athlete feel better and function better while symptomatic**
- **Early diagnosis and education is critical, especially to avoid re-injury**
- **Rest early (7-10 days?) and then gradually increase activity**

Just knowing what's going on is a big help.



What has been accomplished

- The primary goal was to create an awareness of the current acceptable practices in concussion management through education of athletic administrators, coaches, athletes, athletic trainers, parents, school nurses and school physicians. We feel this is happening but ongoing to sustain.



What has been accomplished

- Another goal was to affect an attitudinal change in our athletic communities relative to the seriousness of concussions and the dangers of returning to participation (post concussion syndrome/secondary concussion syndrome) as well as appropriate protocols for return to the classroom environment.



What has been accomplished

- We introduced ImPACT, to schools and encourage its use by establishing baseline test scores for student and athletes which can be compared to post head injury scores as a “**tool**” to help a school medical team assess the seriousness of a possible brain injury and aid in return to play decisions; or, recommendations for further professional neurological testing.



Thoughts to Take with You

- **Athletes with a head injury should not be left alone for the first 24 hours**
- **Regular monitoring for any changes or deteriorations over the first few hours is crucial**



Concussion in Interscholastic Athletics: Summary

- Concussion = MTBI
- *A concussion is a mild traumatic brain injury! (MTBI)*
- It doesn't require a direct blow to the head
- You can have a concussion without being knocked out
- There is *no* return to play on the same day of injury, even if you just “got your bell rung”

Concussion in Interscholastic Athletics: Summary

- The mainstay of concussion therapy early on is REST!
- Neurocognitive testing (e.g., ImPACT) can greatly aid these decisions

Thanks



Remember to wear your helmet !