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The Concussed Athlete: Educating the Educator



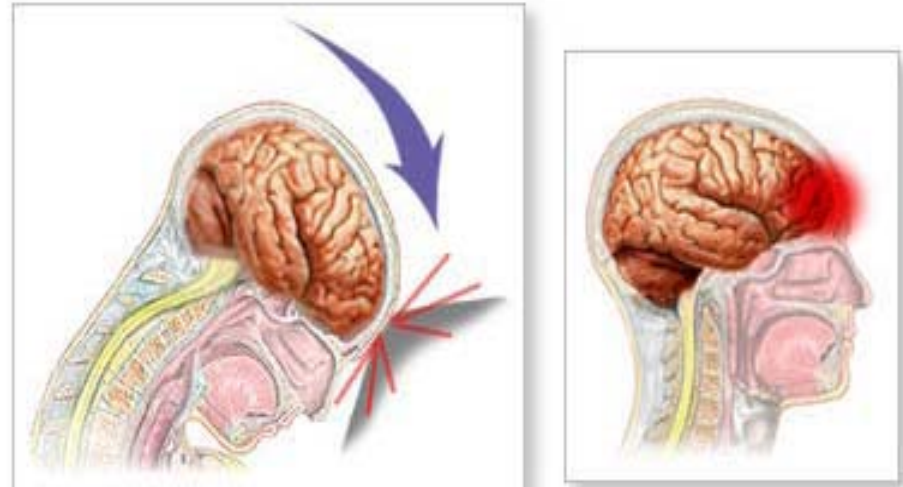
Which Student-Athlete is Concussed?

- Every concussion needs to be dealt with on a case by case basis. Due to the variety of symptoms that can occur with a concussion, treatment needs to be dealt with individually.
- “The goal is to support the recovering student in keeping up with academic demands in a way that does not unduly overstress cognitive functions and cause symptoms to become more extended than they otherwise would be.” - Neil McGrath, Ph.D.

Introduction

- “...a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces.” – 2001 Vienna meeting of the Concussion in Sport Group
- “A concussion is a disturbance in brain function caused by a direct or indirect force to the head. It results in a variety of non-specific symptoms and often does not involve loss of consciousness.” -Sport Concussion Assessment Tool 2

A concussion is a violent jarring or shaking that results in a disturbance of brain function



Definition

- More thorough understanding of what a concussion is and how you can help aid the student in his/her recovery.
- Recommended guidelines for communication within the school district after a student is diagnosed with a concussion.
- The recommended academic accommodations for a student following a concussion and how to implement them.
- To educate athletic trainers, teachers & administrators on how to implement a comprehensive and integrative concussion plan that takes them from initial hit to return to play.

Objectives


Grading Scale (No Longer Used)



Management of Concussion In Sports		
Grades of Concussion:		
Grade 1: 1. Transient confusion (inattention, inability to maintain a coherent stream of thought and carry out goal-directed movements) 2. No loss of consciousness 3. Concussion symptoms or mental status abnormalities on examination resolve in <i>less than 15 minutes</i> .	Grade 2: 1. Transient confusion 2. No loss of consciousness 3. Concussion symptoms or mental status abnormalities (including amnesia) on examination last more than 15 minutes.	Grade 3: 1. Any loss of consciousness a) Brief (seconds) b) Prolonged (minutes)
Management of Athlete:		
Grade 1: 1. Remove from contest 2. Examine immediately and at 5-minute intervals for the development of mental status abnormalities or post-concussive symptoms at rest and with exertion 3. May return to contest if mental status abnormalities or post-concussive symptoms clear within 15 minutes.	Grade 2: 1. Remove from contest and disallow return that day 2. Examine on-site frequently for signs of evolving intracranial pathology 3. A trained person should reexamine the athlete the following day 4. A physician should perform a neurological examination to clear the athlete for return to play after 1 full asymptomatic week at rest and with exertion	Grade 3: 1. Transport the athlete from the field to the nearest emergency department by ambulance if still unconscious or if worrisome signs are detected (with cervical spine immobilization, if indicated) 2. A thorough neurological evaluation should be performed emergently, including appropriate neuroimaging procedures when indicated 3. Hospital admission is indicated if any signs of pathology are detected, or if the mental status of the athlete remains abnormal.
When to Return to Play:		
Grade of Concussion	<i>Return to Play - Only after being asymptomatic with Normal Neurological Assessment at Rest and with Exertion</i>	
Grade 1 Concussion	15 minutes or less	
Multiple Grade 1 concussions	1 week	
Grade 2 Concussion	1 week	
Multiple Grade 2 Concussions	2 weeks	
Grade 3- Brief loss of Consciousness (seconds)	1 week	
Grade 3- Prolonged loss of Consciousness (minutes)	2 weeks	
Multiple Grade 3 Concussions	1 month or longer, based on decision of evaluating physician	

History

- Physical
- Cognitive
- Emotional



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Sports Concussion Program
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Concussion Signs and Symptoms Evaluation

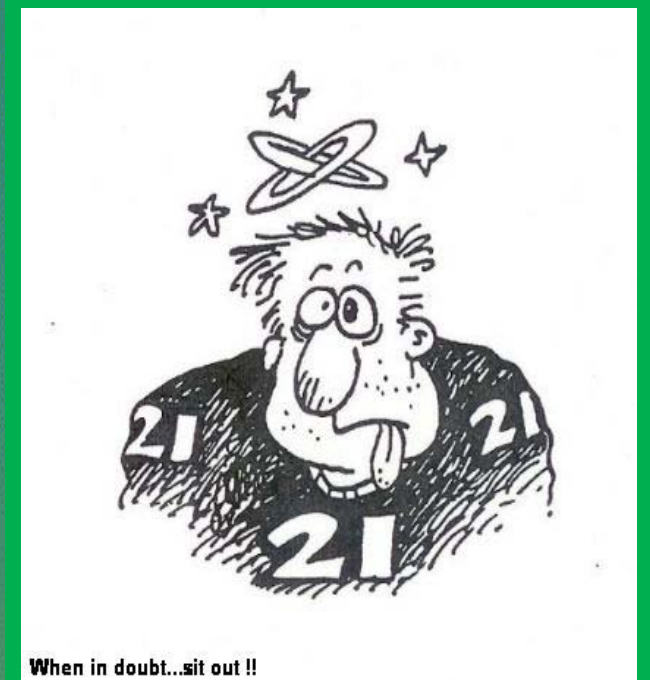
Signs observed by staff	Symptoms reported by athlete
<ul style="list-style-type: none"> • appears to be dazed or stunned • is confused about assignment • forgets plays • is unsure of game, score, or opponent • moves clumsily • answers questions slowly • loses consciousness (<i>even temporarily</i>) • shows behavior or personality change • forgets events prior to hit (<i>retrograde</i>) • forgets events after hit (<i>anterograde</i>) 	<ul style="list-style-type: none"> • headache • nausea • balance problems or dizziness • double or fuzzy vision • sensitivity to light or noise • feeling sluggish • feeling "foggy" • change in sleep pattern • concentration or memory problems

*Symptoms may worsen with exertion.
 Athlete should not return to play until symptom-free.*

For more information
800-533-UPMC (8762)

Signs & Symptoms

- Headache
- Nausea
- Dizziness
- Balance Problems
- Fatigue or Drowsiness
- Oversensitivity to light or noise
- Sleep Difficulties



When in doubt...sit out !!

Physical

- Diminished attention and concentration
- Difficulty with new learning/short term memory
- Word finding problems
- Feeling mentally “foggy”



Cognitive

- Irritability
- Mood Changes
- Nervousness/Anxiety
- Depression
 - Social Isolation



Emotional

- Second Impact Syndrome (SIS)
- Postconcussion Syndrome
- Post-Traumatic Headache (PTHA)



Complications

- Rare but catastrophic event that typically effects the adolescent population
- Those affected are typically symptomatic at the time of re-injury
- With proper care this condition is preventable
- This condition can lead to coma and potentially death

Second Impact Syndrome (SIS)

- Is defined as a continued manifestation of concussion symptoms for greater than 3 weeks following a concussion
- Individuals with a history of concussion may be at greater risk of sustaining subsequent re-injury
- The effects of injury may be additive or cumulative
- May take longer to resolve in adolescents

Post-Concussion Syndrome

- Headache is the most frequently reported symptom following a concussion
- Results in decreased ability to concentrate and also has an impact on memory and thinking processes
- Behavioral and Social issues may develop due to chronic headaches

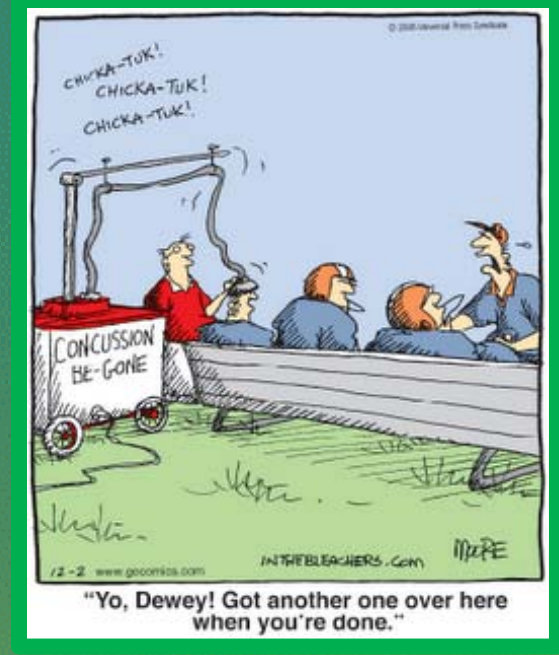
Post-Traumatic Headache (PTHA)

- Most concussions will resolve within a few days to a few weeks.
 - 40% recover in one week, 60% by two weeks, and 80% by three weeks.
- However, some concussions may take several months or longer to resolve
 - One in five athletes with concussion require greater than 3 weeks to resolve. In a small percentage of patients, deficits/symptoms may persist for chronic periods of time.



Recovery Time

- Rest
- Limitations on computer, video games, texting, etc.
- Neuropsychological Testing
- Medications
- Physical Therapy
- Gradual Return to Physical Activity
- Academic Accommodations



Treatment & Management

- Pre-season assessment with computerized cognitive testing such as ImPACT (Immediate Post-Concussion Assessment & Cognitive Testing), or other instruments provide a measurement of each athlete's own usual level of efficiency in cognitive abilities that are expected to be affected by concussion.



Neuropsychological Baseline ImPACT

- Some students will be prescribed medication to assist in their recovery.



- Types of Medications Used:
 - Neurostimulants (e.g. Amantadine, Concerta)
 - Tricyclic Antidepressants (e.g. Amitryptaline)
 - Beta Blockers (e.g. Propanalol)
 - Sleep Medications (Trazodone)
 - Anti Seizure Medications (e.g. Depakote, Topamax)

Medications

- Stages of Exertional Progression
 - Based on Heart Rate
 - Levels of Aerobic Conditioning



Physical Therapy

- 2/2/2/2
 - 2 days symptom free
 - 2 days light activity (non-contact)
 - 2 days moderate activity (controlled contact)
 - 2 days heavy activity (full practice)
 - Return to competition (after medical clearance)
- SCAT 2 Guidelines
 - Rest until asymptomatic
 - Light aerobic exercise
 - Sport-specific exercise
 - Non-contact training drills
 - Full-contact training after medical clearance
 - Return to competition

Gradual Return to Activity Guidelines

- IEP
 - Provides the opportunity for teachers, parents, the student-athlete's physician, the school nurse, and the student-athlete to come together to improve the educational goals for the concussed student-athlete
- 504 Plan –
 - derived from Section 504 of the Rehabilitation Act of 1973.
 - protects the rights of individuals with disabilities in activities and programs that receive federal funds

Individualized Education Program (IEP) & 504 Plans

- Some of the accommodations are similar to those used for students with Attention Deficit Hyperactivity Disorder (ADHD).
- Not every concussed student will require academic accommodations
- Those students who do require academic accommodations may not need all 13

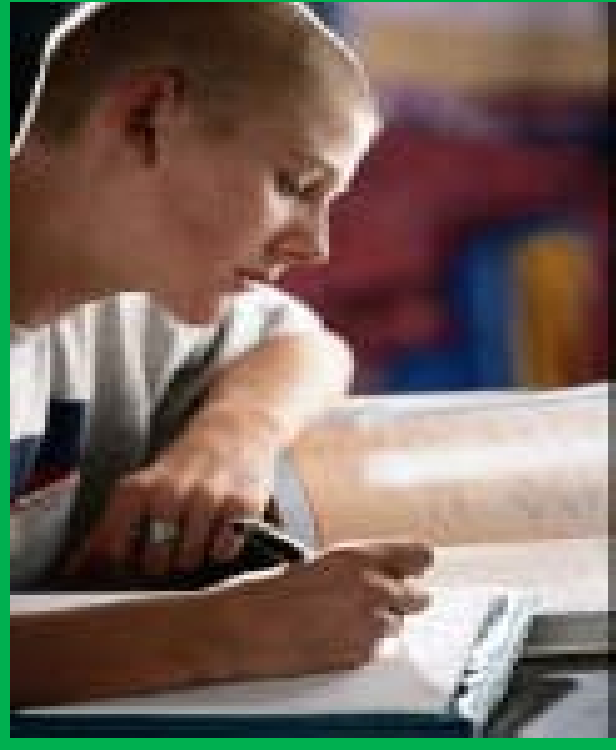
13 Recommended Academic Accommodations

- Complete rest right after injury.
- Partial attendance option includes skipping elective classes and focusing on core classes.
- Arranging to arrive later or leave earlier depending on students schedule and symptoms at different times of the day.

Excused Absence From Classes

- Student can maximize class attendance if they are supported in leaving classes if symptoms flare up.
- Rest in nurse's office or a designated area.
- ½ hour rest makes many students less symptomatic.

Rest Periods During The School Day



- Speed of processing and the ability to handle a full work load are often key limitations.
- Allow extra time for homework and class projects.

Extension Of Assignment Deadlines

- Taking tests while still symptomatic usually places recovering students at a distinct and unfair disadvantage.
- Student is able to do reasonably well on test, may sometime result in exacerbation or prolonging of symptoms.
- Particular care with AP exams, SAT, ACT, or GRE. Some do not allow discarding scores.
- Schedule one final a day.

Postponement Or Staggering Of Tests

- Some students are so symptomatic that postponement or staggering of tests may not provide sufficient accommodations. In such cases, particularly at lower levels of education such as junior high and high school, the most appropriate step may be to excuse students altogether from specific tests in classes in which they have performed well up to the time of their concussion and not push them to go back and make up the work as the school year continues.

Excuse From Certain Tests

- Many students find themselves unable to tolerate normal levels of light or noise while recovering.
- Fluorescent lighting can provoke headaches.
- Noise from cafeteria or assembly halls.

Accommodations To Oversensitivity To Light Or Noise



- In the early days of recovery, avoidance of physical exertion is a priority and any time the student has scheduled for these activities is usually better spent resting or keeping up with class work.

Excuse From Team Sports Practice And Gym Activities

- Since reduced processing speed is one of the most common post concussive symptoms, this is an obvious need for those students who are symptomatic but well enough to attempt to continue with their scheduled exams.

Extended Time On Timed Tests

- Many recovering students find that their symptoms are exacerbated by the visual scanning activity or concentration demands of reading. Having a test tape recorded for the student to listen to at his/her own pace, starting and stopping for each question, or use a reader allows the student to process test questions without the stress of reading.

Use Of Taped Recorded Testing Or A Test Recorder

- Similarly, due to the visual and concentration demands of writing, some students may better convey their answers to essay questions via dictation.

Use Of Dictated Test Answers By Tape Recorder Or Scribe

- During the recovery period, students exhibit some of the characteristics seen in ADHD, including vulnerability to distraction by routine sights and sounds that occur in exam rooms for larger classes.
- Taking test with smaller group or alone may be helpful.

**Use Of Smaller, Quieter Exam Room
To Reduce Stimulation and Distraction**

- Another accommodation typically offered to students with attention deficits who tend to focus better on class and lecture material when seated in front of the classroom or away from doors and windows.

Preferential Classroom Seating To Lessen Distraction

- Students with attention deficiencies may have substantial problems with organization and planning of their studying, papers, test preparation, etc. A short meeting with a guidance counselor or an assigned tutor may help keep the student in touch with his/her priorities.

**Temporary Assistance Of A Tutor To
Assist With Organizing And
Prioritizing Homework Assignments**

- Every school should have a detailed plan in place to:
 - Distribute information to all involved
 - Communicate effectively with all involved
 - Assist the student and parents
 - Provide daily monitoring

Develop School Plan/Policy

Interim Letter Recommending Temporary Accommodations For A Student Following A Concussion

This letter is to inform you that the following student _____ was evaluated on _____ by _____, ATC and it has been determined that he/she has a concussion. We are in the process of arranging an appointment with a physician/neuropsychologist for this student. We are asking that the following recommendations be put in place until the student has been seen by a physician/neuropsychologist.:

- If the student's IMPACT scores are significantly decreased (3 or more "red" scores) or after phone/e-mail consultation with a physician/neuropsychologist, it may be recommended that the athlete stay home from school until he/she can be evaluated further.
- Immediate removal from Physical Education and all physical activity.
- NO TESTING, especially standardized testing, during this time.
- Extra time should be given to student to complete any assignments during this time. *
- Student should be allowed to report to the nurse's office at any time during the school day, if their concussion symptoms regress.
- Students should not be subjected to any loud noises or bright lights during their school day. Ex., cafeteria, shop class, pep rallies, field trips, school concerts, etc...

During the student's appointment with a physician/neuropsychologist, they will be assessed medically and receive any further recommendations and academic accommodations at that time. The student's parents will be informed that **a note from a physician clearing the student will be required for the student to return to PE/Athletics.**

If you have any further questions regarding this student's condition, please feel free to contact Jennifer Wuycik, MS, ATC at _____ or John Geist, ATC at _____.

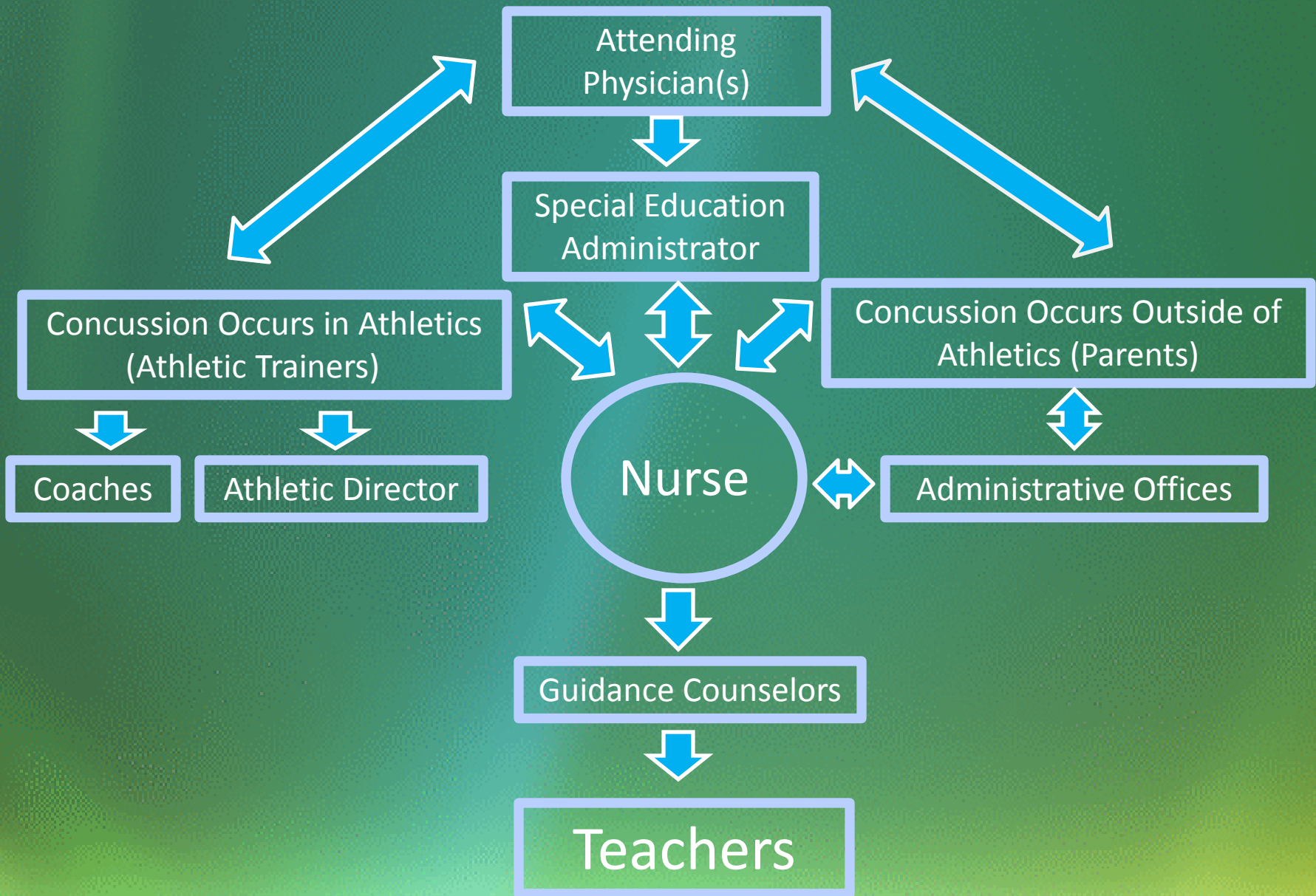
Sincerely,

Jennifer Wuycik, MS, ATC

John Geist, ATC

CC: School Nurse; SBCSD Administration; Athletic Director; Parent

*This letter does not excuse the student from completing their assignments/testing. It is only requesting that extra time be given to complete any assignments/testing, until further evaluation by a physician/neuropsychologist.



Concussion Communication Flowchart

- Who will be baseline tested?
 - Middle School & High School?
 - Athletes Only?
 - Varsity Sports Only? Or Club Sports also?
 - High Risk Sports Only?
- Will the baseline test be mandatory?
- Invalid Baselines?

**Guidelines for Developing School
Policy Regarding Concussions &
Baseline Neuropsych Testing**

- Who can clear the athlete to return?
 - MD, DO, ATC, CRNP,...?
- When will baselines be performed?
 - Prior to school year, prior to every season, in the spring,...?
- How often will athletes need to baseline test?
 - Once in HS career?, every year?, every 2 years? (recommended for ImPACT),...
- Will transfer students have records transferred or will they be baselined at time of transfer?

**Guidelines for Developing School
Policy Regarding Concussions &
Baseline Neuropsych Testing**

- How soon will an athlete be tested following a concussion?
 - 24 to 48 hrs.?, determined on a case by case basis?
- How do you handle concussed athletes regarding school & sports prior to their app't with Dr.?
 - Interim Letter
- Managing concussions for out-of season athletes
- Managing concussions for non-athletes

Guidelines for Developing School Policy Regarding Concussions & Baseline Neuropsych Testing

- Slick, Sherman & Iverson (1999)
 - “Volitional exaggeration or fabrication of cognitive dysfunction for the purpose of obtaining substantial material gain or avoiding/escaping legally obligated formal duty or responsibility.”
- French, Jonathan (2010)
 - “Simply defined – malingering is the attempt of an individual to perform worse than one’s actual ability.”

Malingering - Definition

- “Red Flags”
 - Low ImPACT scores but is not complaining of any difficulties in school.
 - High symptom scores, but ImPACT scores are at baseline or better
 - Reporting significant difficulties, but no mechanism of injury
 - Recovery that does not get better despite significant treatment
 - Athlete reporting no symptoms w/being active, but still claiming to have difficulty in school
 - Athlete reporting significant symptoms with no visible signs observed by ATC/clinician
- Are There External Incentives?
 - Avoiding work, military duty, drugs, money (usually adults only)
 - External pressure to return to sports, psychological reasons, getting out of school (usually kids)

Malingering – When It May Be Suspected

- ImPACT – has built in measures that suggest inadequate effort
- Test of Memory Malingering
- Rey 15 Item Test
- Green's Word Memory Test
- Also embedded measures in other neuropsych tests

Malingering - Testing

- You should now have a better understanding of what a concussion is and how you can help aid the student in his/her recovery.
- You should now understand the recommended guidelines for communication within the school district after a student is diagnosed with a concussion.
- You should now know how to implement the recommended academic accommodations for a student following a concussion.
- You should now know what it takes to implement a comprehensive & integrative concussion plan.

Review Objectives

- **REMEMBER:**

- “The goal is to support the recovering student in keeping up with academic demands in a way that does not unduly overstress cognitive functions and cause symptoms to become more extended than they otherwise would be.”

Neil McGrath, Ph.D.

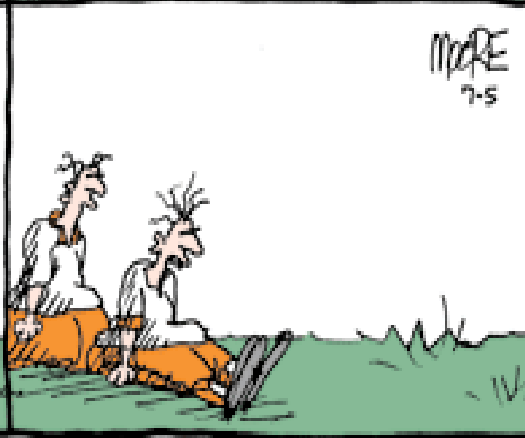
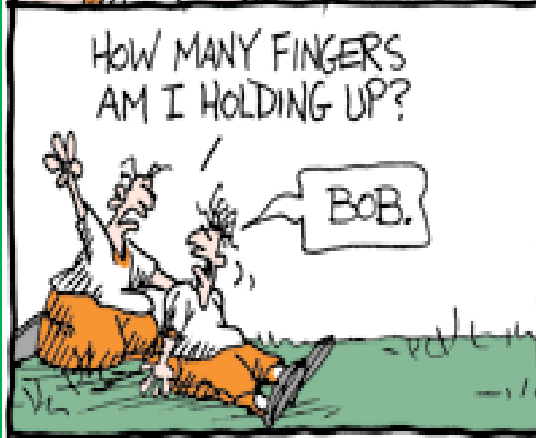
Conclusions

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- McGrath, N. (2009). Supporting the Student Athlete's Return to the Classroom Following a Sports Related Concussion. *Sports Concussion New England*.
- French, Jonathan PsyD. (2010). Evaluating Malingering in Sports Concussions and Mild Traumatic Brain Injury.
- Slick, D. J., Sherman, E. M. S., & Iverson, G. L. (1999). Diagnostic criteria for malingered neurocognitive dysfunction: Proposed standards for clinical practice and research. *The Clinical Neuropsychologist, 13*, 545-561.
- Sport Concussion Assessment Tool 2 (SCAT 2). 3rd International Consensus Meeting on Concussion in Sport, Zurich, Switzerland. Nov. 2008.

References

- Michael Collins, Ph.D.
 - University of Pittsburgh Medical Center
 - Assistant Professor, Department of Orthopaedic Surgery & Department of Neurological Surgery
 - Assistant Director, UPMC Sports Medicine Concussion Program
 - Co-Founder and Chief Clinical Officer, ImPACT Applications

Expert Consultation Provided by:



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THANK YOU!