Objectives

- Understand concussions and their severity
- Recognize concussion signs and symptoms
- Testing for concussions
- Concussion Treatment
  - Steps for returning to activity after a concussion
    - Sports
    - School
- How to develop concussion management and prevention policies

Disclaimer

- This presentation is NOT a legal interpretation of the Safety in Youth Sports Act of 2011
- It meets the educational component within the Safety in Youth Sports Act of 2011
- Offers general guidelines for concussion management
Concussion Basics

- ALL Concussions are Traumatic Brain Injuries (TBIs) and are serious
- Concussions can occur in ALL sports

Concussion Basics

- Most concussions occur without a loss of consciousness
  - History of concussions increase the risk for a repeat concussion
  - Adolescents are at an increased risk and take longer to recover than adults
  - Females may be more susceptible and take longer to recover
- There are physical, metabolic, and chemical changes that occur to the brain
- Important for early recognition of the signs & symptoms of a concussion
  - Prevents further injury & death

Annual TBI by the Numbers

- 52,000 Deaths
- 275,000 Hospitalizations
- 1,365,000 Emergency Department Visits

Concussion Numbers
- Concussion symptoms like headaches and disorientation may disappear in 15 minutes, but 75% of those tested 36 hours later still had problems with memory and cognition.
- Research estimates reveal that 1.6 million to 3.8 million concussions occur each year.
- Some studies suggest that females are twice as likely to sustain a concussion as males.
- Fewer than 10% of sport related concussions involve a Loss of Consciousness (e.g., blacking out, seeing stars, etc.)
- 5-10% of athletes will experience a concussion in any given sport season. www.momsteam.com/health-safety/concussion-rates-high-school-sports

What is a concussion?
- Traumatic Brain Injury (TBI)
- A blow to the head or body, a fall, or another injury that jars or shakes the brain inside the skull.
- Cannot "see" a concussion
  - Disruption to how the brain works on a cellular level
  - MRIs and CT Scans may show normal result even with a concussion
- Causes of a concussion
  - Hit, bump, blow, jolt to body transmitted to head
  - Even a “ding” or getting “your bell rung” can be a concussion

QUIZ 1
- ALL concussions occur from a direct hit to the head?
  - True or False
- Most athlete’s with concussions have a loss of consciousness?
  - True or False
- In order to diagnose a concussion a MRI or CT Scan must be performed?
  - True or False
Severity of Concussions

- Grading Scales are no longer used to determine the level of severity of a concussion
- Experts now recommend determining concussion severity based on symptoms not on grading scales
  - The more symptoms the more severe the concussion
    - Mild symptoms = Mild concussion
    - Moderate symptoms = Moderate concussion
    - Severe symptoms = Severe concussion

How to Recognize a Concussion

- Monitor any hits to the head or body
  - Evaluate ALL athletes who have experienced a forceful bump, blow, or jolt that may cause a concussion
- Encourage athletes to immediately report any hits to the head or body that causes any concussive signs & symptoms
- Encourage everyone to report concerns of possible concussions immediately

Signs Observed by Coaching Staff

- Appears dazed or stunned
- Is confused about assignment or position
- Forgets an instruction
- Is unsure of game, score, or opponent
- Moves clumsily
- Answers questions slowly
- Loses consciousness (even briefly)
- Shows mood, behavior, or personality changes
- Can’t recall events prior to hit or fall
- Can’t recall events after hit or fall
Symptoms Reported by Athlete

- Headache or pressure in head
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light
- Sensitivity to noise
- Feeling sluggish, hazy, foggy, or groggy
- Concentration or memory problems
- Confusion
- Does not “feel right” or “feeling down”

Treatment of Concussions

- Rest is needed to allow the brain time to recover
  - Both cognitive & physical
  - Limit texting, video games, computer use
- Exertion will decrease recovery
  - Both cognitive and physical exertion can delay recovery
- Ignoring a concussion will make it worse

Baseline Testing

- Pre-season neurocognitive screening
  - Assesses brain function; learning, memory, concentration, and ability to think and solve problems
  - Used to help determine if a concussion has occurred
  - One or more of the following serial screening tools should be used if a baseline test is utilized:
    - ImPACT testing
    - SAC testing
    - BESS testing
    - SCAT 2
- If symptoms persist after 8 weeks then neuropsychological testing is indicated
Ongoing Testing

- Concussions can be challenging to diagnose
  - Concussion signs & symptoms may not occur immediately
    - Assess the athlete periodically for several hours after
    - Inform parents/guardians to watch for worsening signs & symptoms of a concussion
  - Refer to an appropriate medical professional to confirm if a concussion has occurred

“Danger Signs”

- What are “Danger Signs”?
  - Deterioration of any signs or symptoms of a concussion including but not limited to:
    - Drowsiness/Inability to awaken
    - Increasing headache or one that doesn’t resolve
    - Weakness, numbness, or lack of coordination
    - Vomiting or nausea
    - Slurred speech
  - These “Danger Signs” are a medical emergency and warrant immediate referral to the ER

Immediate Referral to ER

- Loss of Consciousness (LOC)
- Convulsions or Seizures
- Spinal Cord Involvement
- Other “Danger Signs”
  - Unable to recognize people or places
  - Amnesia
  - Inability to recall new info
  - Unequal pupil size
  - Slurred speech
  - Cerebral Spinal Fluid from ears or nose
QUIZ 2

- ALL of the following EXCEPT are signs of a severe concussion and require immediate medical attention?
  - A. Loss of consciousness
  - B. Increasing headache or one that doesn’t resolve
  - C. Decreased confusion
  - D. ALL of the above are considered Immediate referral signs

Risks of Playing with a Concussion

- Continuing to play with signs & symptoms can slow brain recovery
- Risk of Second Impact Syndrome (SIS)
  - The effects of a concussion may be additive or cumulative
  - SIS can result in death
- Increased risk of long term neurological & psychological consequences
  - Memory loss
  - Depression
  - Chronic Traumatic Encephalopathy (CTE)
  - Seizures

Suspected Concussions

- Athletes should NOT play with a concussion
  - Remind athletes that it is dangerous to continue to play
  - Report it, Don’t hide it!
  - When in Doubt, Sit them Out!
  - Resting due to a concussion is NOT a sign of weakness
Removal of an Athlete

- When you suspect a possible concussion:
  - Remove athlete from play immediately
  - When in doubt, sit them out!
  - Refer to appropriate medical professional with training & experience in concussion diagnosis & treatment for further evaluation
  - Inform athlete’s parent/guardian
    - Provide take home instructions (CDC Fact Sheet)
  - Keep out of play until cleared in writing by an appropriate medical professional
  - Must complete a gradual return to play program over a minimum of 5 days

Post-Concussion Syndrome

- Is a continued manifestation of concussion symptoms for a prolonged period of time following a concussion
  - Decreased processing speed
  - Short-term memory impairment
  - Concentration Deficits
  - Irritability/Depression
  - Fatigue/Sleep Disturbance
  - General feeling of “fogginess”
  - Academic difficulties

Second Impact Syndrome

- Occurs when an athlete sustains an initial concussion and then sustains a second head injury before symptoms from the first have fully resolved.
- Athletes should not return to participation until ALL symptoms are resolved at rest and during exercise
- Second Impact Syndrome can be life-threatening
  - Preston Plevrete (ESPN E:60)
Chronic Traumatic Encephalopathy

• Is a progressive degenerative disease found in individuals who have been subjected to multiple concussions and other mTBI's.
  ➢ Disease mimics Alzheimer's Disease
• Characterized by a number of neurological and physiological changes in the brain including a build-up of abnormal protein
  ➢ Of the 51 confirmed cases, 90% occurred in athletes
• Any athlete that sustains more than 1 concussive injury may be at risk in the future  

www.sportsmd.com

Determining Return to Play

• Return to Play (RTP) should be under the direction of appropriate medical professionals with training in concussion diagnosis & treatment
  ➢ Should be clearly defined in the school’s concussion policy
• 5 gradual steps that may take days, weeks, or months to complete
  ➢ Have the Athletic Trainer involved
  ➢ Should be asymptomatic at rest
  ➢ Graduated exercise progressions
  ➢ Can typically progress daily (24°)
    ➢ If no exacerbation of S/S are reported

Exercise Progression

5 Step Gradual Return-to-Play (RTP)

• Step 1: Light aerobic exercise to increase Heart Rate
  ➢ Bike, walking, elliptical for 5-10 minutes
  ➢ Static stretching program
  ➢ Low-intensity balance exercise
  ➢ NO weight training, NO jumping or hard running
• Step 2: Increased heart rate and incorporate limited body and head movements
  ➢ Moderate hiking or elliptical
  ➢ Moderate weight lifting
  ➢ Dynamic stretching
  ➢ Balance exercises whiles multi-tasking
Exercise Progression

- Step 3: Integrated non-contact physical activity
  - Interval training on treadmill or running
  - Regular weight training
  - Agilites
  - Hard balancing activities
- Step 4: Reintegration into practice (Non-Contact)
  - Normal practice & meeting environment (films)
  - Plyometric training
  - Elevated interval training
  - Aggressive strength training program
  - Non-contact sports specific drills

Exercise Progression

- Step 5: Practice Day
  - Sports Performance training
  - Initiate contact working up to full contact
  - Completion of a full practice
- Full Return to Participation/Play with no restrictions after successful completion of Step 5

Return to the Classroom

- "Back to School" following a concussion
  - Collaborative approach
    - School officials & staff, medical professionals, parents, and athlete
  - Accommodations may be necessary
    - Rest breaks, fewer hours of work, less reading and writing, more time for tests, schoolwork, less time using computers, etc.
Return to the Classroom Cont’

- Important to recognize that ALL concussions are different and people react to them differently
  - Signs & symptoms may last days, weeks, months or longer

- Newly developing concussion management teams can be used to monitor student progress upon return to the classroom following a concussion

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BrainSTEPS

- Brain Injury School Re-Entry Program
  - Strategies
  - Teaching
  - Educators
  - Parents
  - Students

- How to make a referral to BrainSTEPS
  - Visit www.brainsteps.net
  - Click on “Make a Referral”
  - Find the correct county the student-athlete resides in
  - Call or email BrainSTEPS team leader with your student-athlete referral
  - The team will work with the school and family to assist the student-athlete

- Contact info:
  - Brenda Eagan Brown, M.S.Ed, CBIS, Program Coordinator BrainSTEPS
  - eaganbrown@biapa.org

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Concussion Education

- Athlete will often be frustrated and resist rest
  - Educate the athlete about the concerns of playing with a concussion
  - Inform the athlete about complications from playing with a concussion
    - Post Concussion Syndrome
    - Second Impact Syndrome
    - Chronic Traumatic Encephalopathy
  - Offer support to the athlete through the recovery process for a concussion

- Hold annual meetings on concussion education

ALWAYS BETTER TO MISS ONE GAME THAN THE ENTIRE SEASON!

http://www.youtube.com/watch?v=ylqZDblkJ4o
Develop a Concussion Policy

- Details of who is responsible for identifying & removing an athlete from participation
  - Utilize the team physician, athletic trainer, & EMS
- Include academic accommodations
  - Identify who coordinates with teaching staff, nurse, & guidance counselors
- Have a Return-to-Play (RTP) program for ALL athletes

Summary

- Overall goal is to work together to protect & educate our youth
- ALL concussions are dangerous and must be taken serious
- It is NOT safe to play with a concussion
- Check proper equipment is used & fitted correctly
- Teaching proper techniques & enforcing safety rules will help prevent concussions
- Important to recognize concussions early and manage them appropriately
- It is recommended that each school have policies & procedures for managing concussions, including return to play & school

Summary

- ALL schools must develop a concussion policy (action plan) before the season starts
  - Incorporate physician, athletic trainers, nurses, and other school officials
  - Determine removal from & return to play guidelines
  - Determine academic accommodation guidelines
  - Include concussion education materials for athletes and their parents/guardians to sign prior to season
  - Hold educational meetings for teams, school officials, and parents/guardians on concussions and the school’s concussion policy
Frequently Asked Questions

Q: What school systems fall under the Safety and Youth Sports Act?
A: Both public and non-public school entities.

Q: Do school club sports, such as rugby, fall under the Act?
A: Yes, any schools involved in interscholastic sports, as well as school-sponsored clubs and youth activities, fall under the Act.

Q: How does a school develop a policy for return to play?
A: Schools should collaborate with school administrators, athletic trainer, school nurse, and coaches to develop a policy for return to play. Having a policy will ensure consistency of application. BIAPA has developed a model policy [link](http://www.biapa.org/site/c.iulZJbMMKrH/b.7950367/k.8C7A/SportsRelated_Concussions.htm)

Q: Is it mandatory that each school entity develop a policy for return to play?
A: This is not a mandate in the Pennsylvania Law but having a policy will ensure consistency of application.

Q: Do all coaches need to complete training or just the head coach of a sport?
A: All coaches need to be trained, including assistants & volunteers

Q: Is there a school affiliated professional that would take a student through the step by step return to play progression or does this have to happen in an outpatient setting at a concussion clinic?
A: The Act does not specifically mention the step by step return to play but the language indicates the return to play evaluation and clearance is limited to appropriate medical professionals, such as the athletic trainer. It is always best to provide consistency for return to play.
Frequently Asked Questions

Q: Is the baseline for all athletes required or recommended? Is it for each sport play?
A: Concussion baseline testing is not required under the Act. It is highly suggested to implement baseline testing for all athletes. Follow the recommendation of the neurocognitive test that you implement.

Q: Is there a sample acknowledgement form available?
A: There is a section of the PIAA Comprehensive Initial Pre-Participation Physical Exam (CIPPE) that has a form: http://www.piaa.org/assets/web/documents/Section%20VI%20Forms%20CIPPE_FORM_SECTIONS_1_2_3_4_5_6_AND_7.pdf
Pennsylvania Department of Education has also developed an acknowledgement form and a sample return to play form: www.education.state.pa.us/portal/server.pt/community/safe_schools/7512/traumatic_brain_injury/508661

Q: If a coach takes a concussion course successfully, does that allow them to make Return to Play decisions if there is NO appropriate medical professional present?
A: No, the coach can remove them from play but the law specifically states that the coach shall not return a student to participation until the student is evaluated and cleared for return to participation in writing by an appropriate medical professional.

Q: What is BrainSTEPS?
A: www.brainsteps.net for more information

Frequently Asked Questions

Q: In Pennsylvania, who is considered a licensed physician?
A: The Medical Practice Act defines physician as “a medical doctor or doctor of osteopathy (MD, DO).

Q: Which students and parents/guardians need concussion education and how often?
A: All students participating in or desiring to participate in athletic activity and the student’s parent/guardian shall each school year, prior to participation sign and return an acknowledgement of receipt and review of a concussion and traumatic brain injury information sheet.
Frequently Asked Questions

Q: Who determines if a concussion has occurred?
A: The appropriate medical professional on-site should determine whether a concussion has occurred. This Act gives the official the opportunity to remove an athlete from a game to be examined by an appropriate medical professional to determine if a concussion has occurred. For example, if an official would see an athlete vomiting, unbalanced, confused, or struggling to get back into play he would refer to the appropriate medical professional on-site. At this point, the appropriate medical professional will evaluate the athlete and if they are in distress for any reason other than a concussion they may return to the game when fit to do so. Once the diagnosis of concussion has been determined, an athlete will not return to play. If an appropriate medical professional is not available to determine if a concussion has, or has not, been sustained the athlete should not return to play until evaluated by an appropriate medical professional.

Frequently Asked Questions

Q: Are Athletic Trainers considered appropriate medical professionals?
A: Yes. Athletic Trainers (ATs) are licensed health care professionals who are considered appropriate medical professionals as long as they are designated by a licensed physician trained in the management of concussions. Athletic Trainers should have an established and delineated subsection on concussion included in their written protocol with their physician that discusses criteria on how concussions will be handled from assessment to establishing a safe return to play and school.

PA DOH
Traumatic Brain Injury Link

http://www.portal.state.pa.us/portal/server.pt?open=514&objID=666239&mode=2