Sports-Related Concussion/Head Injury Fact Sheet

A concussion is a brain injury that can be caused by a blow to the head or body that disrupts normal functioning of the brain. Concussions are a type of Traumatic Brain Injury (TBI), which can range from mild to severe and can disrupt the way the brain normally functions. Concussions can cause significant and sustained neuropsychological impairment affecting problem solving, planning, memory, attention, concentration, and behavior.

The Centers for Disease Control and Prevention estimates that 300,000 concussions are sustained during sports related activities nationwide, and more than 62,000 concussions are sustained each year in high school contact sports. Second-impact syndrome occurs when a person sustains a second concussion while still experiencing symptoms of a previous concussion. It can lead to severe impairment and even death of the victim.

Legislation (P.L. 2010, Chapter 94) signed on December 7, 2010, mandated measures to be taken in order to ensure the safety of K-12 student-athletes involved in interscholastic sports in New Jersey. It is imperative that athletes, coaches, and parent/guardians are educated about the nature and treatment of sports related concussions and other head injuries. The legislation states that:

- All Coaches, Athletic Trainers, School Nurses, and School/Team Physicians shall complete an Interscholastic Head Injury Safety Training Program by the 2011-2012 school year.
- All school districts, charter, and non-public schools that participate in interscholastic sports will distribute annually this educational fact sheet to all student athletes and obtain a signed acknowledgement from each parent/guardian and student-athlete.
- Each school district, charter, and non-public school shall develop a written policy describing the prevention and treatment of sports-related concussion and other head injuries sustained by interscholastic student-athletes.
- Any student-athlete who participates in an interscholastic sports program and is suspected of sustaining a concussion will be immediately removed from competition or practice. The student-athlete will not be allowed to return to competition or practice until he/she has written clearance from a physician trained in concussion treatment and has completed his/her district's graduated return-to-play protocol.

Quick Facts about Concussions

- Most concussions do not involve loss of consciousness
- You can sustain a concussion even if you do not hit your head
- A blow elsewhere on the body can transmit an "impulsive" force to the brain and cause a concussion

Signs of Concussions (Observed by Coach, Athletic Trainer, Parent or Guardian)

- Appears dazed or stunned
- Forgets plays or demonstrates short term memory difficulties (e.g. unsure of game, opponent)
- Exhibits difficulties with balance, coordination, concentration, and attention
- Answers questions slowly or inaccurately
- Demonstrates behavior or personality changes
- Is unable to recall events prior to or after the hit or fall

Symptoms of Concussion (Reported by Student-Athlete)

- Headache
- Nausea/vomiting
- Balance problems or dizziness
- Double vision or changes in vision
- Sensitivity to light/sound
- Feeling of sluggishness or fogginess
- Difficulty with concentration, short term memory, and/or confusion

What Should a Student-Athlete do if they think they have a concussion?

- **Don't hide it**. Tell your Athletic Trainer, Coach, School Nurse, or Parent/Guardian.
- **Report it**. Don't return to competition or practice with symptoms of a concussion or head injury. The sooner you report it, the sooner you may return-to-play.
- **Take time to recover**. If you have a concussion your brain needs time to heal. While your brain is healing you are much more likely to sustain a second concussion. Repeat concussions can cause permanent brain injury.

What can happen if a student-athlete continues to play with a concussion or returns to play to soon?

- Continuing to play with the signs and symptoms of a concussion leaves the student-athlete vulnerable to second impact syndrome.
- Second impact syndrome is when a student-athlete sustains a second concussion while still having symptoms from a previous concussion or head injury.
- Second impact syndrome can lead to severe impairment and even death in extreme cases.

Should there be any temporary academic accommodations made for Student-Athletes who have suffered a concussion?

- To recover cognitive rest is just as important as physical rest. Reading, texting, testing-even watching movies can slow down a student-athletes recovery.
- Stay home from school with minimal mental and social stimulation until all symptoms have resolved.
- Students may need to take rest breaks, spend fewer hours at school, be given extra time to complete assignments, as well as being offered other instructional strategies and classroom accommodations.

Student-Athletes who have sustained a concussion should complete a graduated return-to-play before they may resume competition or practice, according to the following protocol:

- **Step 1**: Completion of a full day of normal cognitive activities (school day, studying for tests, watching practice, interacting with peers) without reemergence of any signs or symptoms. If no return of symptoms, next day advance.
- **Step 2:** Light Aerobic exercise, which includes walking, swimming, and stationary cycling, keeping the intensity below 70% maximum heart rate. No resistance training. The objective of this step is increased heart rate.
- **Step 3:** Sport-specific exercise including skating, and/or running: no head impact activities. The objective of this step is to add movement.
- **Step 4:** Non-contact training drills (e.g. passing drills). Student-athlete may initiate resistance training.
- **Step 5:** Following medical clearance (consultation between school health care personnel and student-athlete's physician), participation in normal training activities. The objective of this step is to restore confidence and assess functional skills by coaching and medical staff.
- **Step 6:** Return to play involving normal exertion or game activity.

For further information on Sports-Related Concussions and other Head Injuries, please visit:

www.cdc.gov/concussion/sports/index.html www.nfhs.com
www.ncaa.org/health-safety www.bianj.org www.atsnj.org

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NJSIAA STEROID TESTING POLICY

In Executive Order 72, issued December 20, 2005, Governor Richard Codey directed the New Jersey Department of Education to work in conjunction with the New Jersey State Interscholastic Athletic Association (NJSIAA) to develop and implement a program of random testing for steroids, of teams and individuals qualifying for championship games.

Any student-athlete who possesses, distributes, ingests or otherwise uses any of the following banned substances, without written prescription by a fully-licensed physician, as recognized by the American medical Association, to treat a medical condition, violates the NJSIAA's sportsmanship rule, and is subject to NJSIAA penalties, including ineligibility from completion. The NJSIAA will test certain randomly selected individuals and teams that qualify for a state championship tournament or state championship completion for banned substances. The result of all tests shall be considered confidential and shall only be disclosed to the student, his or her parents and his or her school. No student may participate in NJSIAA competition unless the student and the student's parent/guardian consent to random testing.

NJSIAA Banned-Drug Classes

The term "related compounds" comprises substances that are included in the class by their pharmacological action and/or chemical structure. No substance belonging to the prohibited class may be used, regardless of whether it is specifically listed as an example.

Many nutritional/dietary supplements contain NJSIAA banned substances. In addition, the U.S Food and Drug Administration (FDA) does not strictly regulate the supplement industry; therefore purity and safety of nutritional dietary supplements cannot be guaranteed. Impure supplements may lead to a positive NJSIAA drug test. **The use of supplements is at the student-athlete's own risk**. Student-athletes should contact their physician or athletic trainer for further information.

The following is a list of banned-drug classes, with examples of banned substances under each class:

(a) Stimulants

amiphenazole
amphetamine
bemigride
benzphetamine
bromantan
caffeine (guorana)
chlorphentermine
Cocaine
cropropamide
crothetamide
diethylpropion
dimethylamphetmine
doxapram
Ephedrine
(ephedra, ma huang)
Ethamivan
Ethyl amphetamine
Fencamfamine
Meclofenoxate
Methamphetamine
Methylenedioxymethamphetamine
(MDMA, ecstasy)
Methylphenidate
Nikethamide
Pemoline
Pentetrazol
Phendimetrazine
Phenmetrazine
Phentermine
Phenylpropanolamine (ppa)
Picrotoxine
Pipradol
Prolintane
Strychnine

(b) Anabolic Agents

anabolic steroids

androstenediol
androstenedione
boldenone
clostebol
dehydrochlormethyl-testosterone
dehydroepiandro-sterone (DHEA)
dihydrotestosterone (DHT)
dromostanolone
epitrenbolone
fluoxymesterone
gestrinone
mesterolone
methandienone
methenolone
methyl testosterone
nandrolone
norandrostenediol
norandrostenedione
norethandrolone
oxandrolone
oxymesterone
oxymetholone
pregnelone
stanozolol
testosterone
tetrahydrogestrinone (THG)
trenbolone

and related compounds

other anabolic agents

clenbuterol

Synephrine (citrus aurantium, zhi shi, bitter orange)

(c) Diuretics

acetazolamide
bendroflumethiazide
benzhiazide
bumetanide
chlorothiazide
chlorthalidone
ethacrynic acid
flumethiazide
furosemide
hydrochlorothiazide
hydroflumenthiazide
methyclothiazide
metolazone
polythiazide
quinethazone
spironolactone
triamterene
trichlormethizide

and related compounds

(d) Peptide Hormones & Analogues:

corticotrophin (ACTH)
human chorionic gonadotropin (hCG)
luteinizing hormone (LH)
growth hormone (HGH, somatotrophin)
insulin like growth hormone (IGH-1)

All the respective releasing factors of the above-mentioned substances also are banned:

erythropoietin (EPO)
darbypoetin
sermorelin

(e) Definitions of positive depends on the following:

for caffeine- if the concentration in urine exceeds 15 micrograms/ml
for testosterone- if administration of testosterone or use of any other manipulation has the result of increasing the ratio of the total concentration of testosterone to that of epitestosterone in the urine of greater than 6:1, unless there is evidence that this ratio is due to a physiological or pathological condition.

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BASIC FACTS of **SUDDEN CARDIAC DEATH** in YOUNG ATHLETES

Sudden death in young athletes between the ages of 10 and 19 is very rare. What, if anything, can be done to prevent this kind of tragedy?

What is sudden cardiac death in the young athlete?

Sudden cardiac death is the result of an unexpected failure of proper heart function, usually (about 60% of the time) during or immediately after exercise *without trauma*. Since the heart stops pumping adequately, the athlete quickly collapses, loses consciousness, and ultimately dies unless normal heart rhythm is restored using an automated external defibrillator (AED).

How common is sudden death in young athletes?

Sudden cardiac death in young athletes is very rare. About 100 such deaths are reported in the United States per year. The chance of sudden death occurring to any individual high school athlete is about one in 200,000 per year. Sudden cardiac death is more common: in males than in females; in football and basketball than in other sports; and in African-Americans than in other races and ethnic groups.

What are the most common causes?

Research suggests that the main cause is a loss of proper heart rhythm, causing the heart to quiver instead of pumping blood to the brain and body. This is called ***ventricular fibrillation*** (*ven- TRICK-you-lar fib-roo-LAY-shun*). The problem is usually caused by one of several cardiovascular abnormalities and electrical diseases of the heart that go unnoticed in healthy-appearing athletes. The most common cause of sudden death in an athlete is ***hypertrophic cardiomyopathy*** (hi-*per-TRO-fic CARdee- oh-my-OP-a-thee*) also called HCM. HCM is a disease of the heart, with abnormal thickening of the heart muscle, which can cause serious heart rhythm problems and blockages to blood flow. This genetic disease runs in families and usually develops gradually over many years. The second most likely cause is ***congenital*** (*con-JEN-it-al*) (i.e., present from birth) ***abnormalities of the coronary arteries****.* This means that these blood vessels are connected to the main blood vessel of the heart in an abnormal way. This differs from blockages that may occur when people get older (commonly called "coronary artery disease," which may lead to a heart attack). Other diseases of the heart that can lead to sudden death in young people include:

- ***Myocarditis*** (*my-oh-car-DIE-tis*), an acute inflammation of the heart muscle (usually due to a virus).
- ***Dilated cardiomyopathy***, an enlargement of the heart for unknown reasons.
- ***Long QT syndrome*** and other electrical abnormalities of the heart which cause abnormal fast heart rhythms that can also run in families.
- ***Marfan syndrome***, an inherited disorder that affects heart valves, walls of major arteries, eyes and the skeleton. It is generally seen in unusually tall athletes, especially if being tall is not common in other family members.

Are there warning signs to watch for?

In more than a third of these sudden cardiac deaths, there were warning signs that were not reported or taken seriously. Warning signs are:

- Fainting, a seizure or convulsions during physical activity
- Fainting or a seizure from emotional excitement, emotional distress or being startled
- Dizziness or lightheadedness, especially during exertion
- Chest pains, at rest or during exertion
- Palpitations - awareness of the heart beating unusually (skipping, irregular or extra beats) during athletics or during cool down periods after athletic participation
- Fatigue or tiring more quickly than peers
- Being unable to keep up with friends due to shortness of breath

What are the current recommendations for screening young athletes?

New Jersey requires all school athletes to be examined by their primary care physician ("medical home") or school physician at least once per year. The New Jersey Department of Education requires use of the specific Annual Athletic Pre-Participation Physical Examination Form. This process begins with the parents and student-athletes answering questions about *symptoms* during exercise (such as chest pain, dizziness, fainting, palpitations or shortness of breath); and questions about *family health history*. The primary healthcare provider needs to know if any family member died suddenly during physical activity or during a seizure. They also need to know if anyone in the family under the age of 50 had an unexplained sudden death such as drowning or car accidents. This information must be provided annually for each exam because it is so *essential to identify those at risk for sudden cardiac death.* The required physical exam includes measurement of blood pressure and a careful listening examination of the heart, especially for murmurs and rhythm abnormalities. If there are no warning signs reported on the health history and no abnormalities discovered on exam, no further evaluation or testing is recommended.

Are there options privately available to screen for cardiac conditions?

Technology-based screening programs including a 12-lead electrocardiogram (ECG) and echocardiogram (ECHO) are noninvasive and painless options parents may consider in addition to the required PPE. However, these procedures may be expensive and are not currently advised by the American Academy of Pediatrics and the American College of Cardiology unless the PPE reveals and indication for these tests. In addition to the expense, other limitations of technology-based tests include the possibility of "false positives" which leads to unnecessary stress for the student and parent/guardian as well as unnecessary restriction from athletic participation. The United States Dept. of Health and Human Services offers risk assessment options under the Surgeon General's Family History Initiative available at http://www.hhs.gov/familyhistory/index.html.

When should a student athlete see a heart specialist?

If the primary healthcare provider or school physician has concerns, a referral to a child heart specialist, a pediatric cardiologist, is recommended. This specialist will perform a more thorough evaluation, including an electrocardiogram (ECG), which is a graph of the electrical activity of the heart. An echocardiogram, which is an ultrasound test to allow for direct visualization of the heart structure, will likely also be done. The specialist may also order a treadmill exercise test and a monitor to enable a longer recording of the heart rhythm. None of the testing is invasive or uncomfortable.

Can sudden cardiac death be prevented just through proper screening?

A proper evaluation should find most, but not all, conditions that would cause sudden death in the athlete. This is because some diseases are difficult to uncover and may only develop later in life. Others can develop following a normal screening evaluation, such as an infection of the heart muscle from a virus. This is why screening evaluations and a review of the family health history need to be performed on a yearly basis by the athlete's primary healthcare provider. With proper screening and evaluation, most cases can be identified and prevented.

Why have an AED on site during sporting events?

The only effective treatment for ventricular fibrillation is immediate use of an automated external defibrillator (AED). And AED can restore the heart back into a normal rhythm. An AED is also life-saving for ventricular fibrillation caused by a blow to the chest over the heart (commotion cordis). NJSA 18A:40-41a-c, known as "Janet's Law," requires that at any school-sponsored athletic event or team practice in NJ public and nonpublic schools including any of grades K through 12, the following must be available:

- An AED in a unlocked location on school property within a reasonable proximity to the athletic field or gym and
- A team coach, licensed athletic trainer, or other designated staff member if there is no coach or licensed athletic trainer present, certified in cardiopulmonary resuscitation (CPR) & the use of the AED; **or**
- A State-certified emergency services provider or other certified first responder.

The American Academy of Pediatrics recommends the AED should be placed in central location that is accessible and ideally no more than a 1-1.5 minute walk from any location and that a call is made to activate 911 emergency system while the AED is being retrieved.

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BASIC FACTS of **SPORTS-RELATED EYE INJURIES**

Participating in sports and recreational activities is an important part of a healthy, physically active lifestyle for children. Unfortunately, injuries can, and do, occur. Children are at particular risk for sustaining a sports-related eye injury and most of these injuries can be prevented. Every year, more than 30,000 children sustain serious sport-related eye injuries. Every 13 minutes, an emergency room in the United Stated treats a sports-related eye injury. According to the National Eye Institute, the sports with the highest reat of eye injuries are: baseball/softball, ice hockey, racquet sports and basketball, followed by fencing, lacrosse, paintball and boxing.

Thankfully, there are steps that parents can take to ensure their children's safety on the field, the court or wherever they play or participate in sports and recreational activities.

PREVENTION OF SPORTS-RELATED EYE INJURES

Approximately 90% of sports-related eye injuries can be prevented with simple precautions, such as using protective eyewear. **Each sport has a certain type of recommended protective eyewear, as determined by the American Society for Testing and Materials (ASTM). Protective eyewear should sit comfortably on the face. Poorly fitted equipment may be uncomfortable, and may not offer the best eye protection. Protective eyewear for sports includes, among other things, safety goggles and eye guards, and it should be made of polycarbonate lenses, a strong, shatterproof plastic. Polycarbonate lenses are much stronger than regular lenses.**

Health care providers (HCP), including family physicians, ophthalmologists, optometrists, and others, play a critical role in advising students, parents and guardians about the proper use of protective eyewear. To find out what kind of eye protection is recommended and permitted for your child's sport, visit the National Eye Institute at http://www.nei.nih.gov/sports/findingprotection.asp. Prevent Blindness America also offers tips for choosing and buying protective eyewear at http://www.preventblindness.org/tips-buying-sports-eye-protectors, and http://preventblindness.org/recommended-sports-eye-protectors.

It is recommended that all children participating in school sports or recreational spots wear protective eyewear. Parents and coaches need to make sure young athletes protect their eyes, and properly gear up for the game. Protective eyewear should be part of any uniform to help reduce the occurrence of sports-related eye injuries. Since many youth teams do not require eye protection, parents may need to ensure that their children wear safety glasses or goggles whenever they play sports. Parents can set a good example by wear ing protective eyewear when they play sports.

MOST COMMON TYPES OF EYE INJURIES

The most common types of eye injuries that can result from sports injuries are blunt injuries, corneal abrasions and penetrating injuries.

***BLUNT INJURIES:** Blunt injuries occur when the eye is suddenly compressed by impact from an object. Blunt injuries, often caused by tennis balls, racquets, fists or elbows, sometimes cause a black eye or hyphema (bleeding in front of the eye). More serious blunt injuries often break bones near the eye, and may sometimes seriously damage important eye structures and/or lead to vision loss.

***CORNEAL ABRASIONS:** Corneal abrasions are painful scrapes on the outside of the eye, or the cornea. Most corneal abrasions eventually heal on their own, but a doctor can best assess the extent of the abrasion, and may prescribe medication to help control the pain. The most common cause of a sports-related corneal abrasion is being poked in the eye by a finger.

***PENETRATING INJURIES:** Penetrating injuries are caused by a foreign object piercing the eye. Penetrating injuries are very serious, and often result in severe damage to the eye. These injuries often occur when eyeglasses break while they are being worn. Penetrating injuries must be treated quickly in order to preserve vision.

SIGNS OR SYMPTOMS OF AN EYE INJURY

*** Pain with looking up and/or down or difficulty seeing**
*** Tenderness**
*** Sunken eye**
*** Double vision**
*** Severe eyelid and facial swelling**
*** Difficulty tracking/eye movement**
*** The eye has an unusual pupil size or shape**
*** Blood in the clear part of the eye**
*** Numbness of the upper cheek and gum**
*** Severe redness around the white part eye**

WHAT TO DO IF A SPORTS-RELATED EYE INJURY OCCURS

If a child sustains an eye injury, it is recommended that he/she receive immediate treatment from a licensed HCP (e.g., eye doctor) to reduce the risk of serious damage, including blindness. It is also recommended that the child, along with his/her parent or guardian, seek guidance from the HCP regarding the appropriate amount of time to wait before returning to sports competition or practice after sustaining an eye injury. The school nurse and the child's teachers should also be notified when a child sustains an eye injury. A parent or guardian should also provide the school nurse with a physician's note detailing the nature of the eye injury, any diagnosis, medical orders for the return to school, as well as any prescription(s) and /or treatment(s) necessary to promote healing, and the safe resumption of normal activities, including sports and recreational activities.

RETURN TO PLAY AND SPORTS

According to the American Family Physician Journal, there are several guidelines that should be followed when students return to play after sustaining an eye injury. For example, students who have sustained significant ocular injury should not return to play until the period of time recommended by their HCP has elapsed. For more minor eye injuries, the athletic trainer may determine that it is safe for a student to resume play based on the nature of the injury, and how the student feels. No matter what degree of eye injury is sustained, it is recommended that students wear protective eyewear when returning to play and immediately report any concerns with their vision to their coach and/or the athletic trainer.

Additional information on eye safety can be found at http://isee.nei.nih.gov and http://www.nei.nih.gov/sports.

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Parent/Guardian Consent and Acknowledgement Form

CONSENT TO RANDOM DRUG TESTING

By signing below, we consent to random testing in accordance with the NJSIAA steroid testing policy we received by Lindenwold Public Schools. We understand that, if the student or the student's team qualifies for the state championship tournament or state championship competition, the student may be subject to testing for banned substances.

_____	_____	_____
Signature of Student-Athlete	Print Student-Athlete's Name	Date
_____	_____	_____
Signature of Parent/Guardian	Print Parent/Guardian's Name	Date

ACKNOWDLEDGMENT OF RECIEPT & REVIEW OF SUDDEN CARDIAC ARREST, SPORTS-RELATED CONCUSSION/HEAD INJURY and EYE INJURY FACT SHEETS

By signing below, we are acknowledging the receipt of the sudden cardiac arrest, sports-related concussion/head injury and eye injury fact sheets distributed by Lindenwold Public Schools. We have read and understand the information provided regarding sudden cardiac arrest and recognition, treatment and return to play when a student-athlete sustains a concussion or an eye injury along with appropriate protective eyewear recommendations.

_____	_____	_____
Signature of Student-Athlete	Print Student-Athlete's Name	Date
_____	_____	_____
Signature of Parent/Guardian	Print Parent/Guardian's Name	Date