

## BY-LAW ARTICLE III Sports Medicine

### **Sect. 1: Medical Coverage at Athletic Events**

The importance of the long-range safety of high school athletes cannot be overstated. Consequently, the NHIAA and its member schools will favor medical safety over any other countervailing concerns including competitive advantage. Every high school in New Hampshire must make provisions for **licensed** medical personnel at all practices and contests. The types of provisions that are acceptable are (the provisions are in alphabetical order, not preferential order):

1. Athletic Trainer
2. Board Certified Sports Physical Therapist
3. Emergency Medical Technician
4. Nurse
5. Nurse Practitioner
6. Physician
7. Physician Assistant
8. Systems developed to call medical personnel to the site of the athletic event

At the athletic competitions where medical coverage is either provided or mandated by the NHIAA, injuries sustained by athletes will be evaluated by the designated medical personnel. The clearance to re-enter competition after an injury will be made by the designated medical personnel only. Absent unanimous agreement between the designated medical personnel to allow continued participation, an injured player will not be allowed to return to the game. Their decision is final and cannot be overturned by the coach, coaching staff, parents/guardians, or any non-designated personnel.

When the NHIAA provides qualified medical personnel and member schools also provide qualified medical personnel, it is expressly understood that the NHIAA provider shall defer to the school designated qualified medical personnel if requested. If the member school does not provide qualified medical personnel or if no deferral is requested, the NHIAA provider will act as the designated medical personnel. In choosing who should act as the designated medical personnel, all medical personnel are expected to act in the best interests of the student athletes and participate to the extent that his or her expertise will increase the quality of the care delivered. Prior to the start of the event the NHIAA assigned medical personnel, in conjunction with the designated site manager, should review this requirement and determine the procedures/chain of command to be identified during the event to ensure compliance with the provisions stated in this By-Law. Note: Student trainers, high school or college, cannot be used to meet the provisions of this By-Law.

### **Sect. 2: Medical Statement**

- A. Students shall be ineligible to participate in interscholastic athletics (practices or games) unless there is on file in the school a *medical statement* provided by a physician, nurse practitioner, or physician's assistant (within the meaning of NH RSA 329) certifying the student athlete has passed a pre-participation physical examination prior to the beginning of the student athlete's high school athletic career. In every subsequent year, athletes shall have an updated medical history. A physical examination pertinent to their needs shall be performed, if deemed necessary. Any student athlete significantly ill or injured since the last review shall be re-examined by a physician, nurse practitioner, or physician's assistant in order to be eligible to participate in interscholastic athletics.
- B. A medical statement must be completed by a physician, ARNP or by a qualified non-physician health practitioner under the direct supervision of a physician (within the meaning of NH RSA 329).
- C. A family may apply to the NHIAA Executive Director through the school administration for a waiver of this By-Law based on religious reasons. Prior to approving such requests, the parent and/or legal guardian must sign the NHIAA waiver form which holds the NHIAA harmless for any medical problems that arise.
- D. Local school districts may impose requirements that exceed the provisions of this By-Law.

### **Sect. 3: Absence of or Disease of One Paired Organ**

No student athlete with the absence of one paired organ shall participate in inter-scholastic athletics unless the student athlete provides his/her principal with completion of a medical release completed by a physician, ARNP or by a qualified non-physician health practitioner. The student athlete is required to wear the protective equipment recommended by the medical specialist for all practices and games. It is required that copies of all materials be filed with the NHIAA.

### **Sect. 4: Use of Artificial Limbs**

The NHIAA authorizes the use of artificial limbs which in its opinion are no more dangerous to players than the corresponding human limb and do not place an opponent at a disadvantage. The authority to determine such rule lies with the Executive Director and the National Federation Rules Interpreter for that sport. All requests for rulings must be submitted in writing by the principal of the member school.

### **Sect. 5: Prohibited Use of Tobacco Products**

No coach, game official, athletic team member or player of an NHIAA member school shall use or smoke any tobacco product (smokeless or otherwise) at any NHIAA sponsored or sanctioned event in which the coach, game official, team member or player is involved.

### **Sect. 6: Resolution: Model To Set Standards For Alcohol Or Mood-Altering Chemicals**

#### **Statement of Philosophy**

It is the philosophy of the NHIAA and its member schools that students should be encouraged and supported in their efforts to develop and maintain a chemical-free lifestyle.

The NHIAA and its member schools recognize the use of alcohol or mood-altering chemicals as a significant health problem for many students, resulting in negative effects on behavior, learning and the total development of each individual.

The NHIAA and its member schools believe the close contact of coaches, advisors and students in the classroom or activities provides a unique opportunity to observe, confront and assist one another.

#### **Statement of Purpose:**

1. Emphasize concerns for the health of students in areas of safety while participating in activities and the long-term physical and emotional effects of chemical use on their health.
2. Promote a sense of order and discipline among students.
3. Confirm and support existing state laws, which restrict the use of alcohol or such mood-altering chemicals.
4. Establish standards of conduct for those students who are leaders and standard-bearers among their peers.
5. Assist students who desire to resist peer pressure, which directs them toward the use of alcohol or mood-altering chemicals.
6. Assist students who should be referred for assistance or evaluation regarding their use of alcohol or mood-altering chemicals.

**A Code of Conduct:** Recognizing the diversity of its member schools, the NHIAA recommends that a Code of Conduct incorporate the following:

1. **Philosophy:** Specify the philosophy and basis for recommending a code of conduct.
2. **Purpose for Establishing Rules:** State the reasons for setting standards and the educational rationale for assisting students through such standards.
3. **Defining the Rule:** Incorporate alcohol or the mood-altering chemicals to be included; the time during which the students are responsible for the rules.
4. **Specifying the Consequences for Violations of the Rule:** Define the activities for which the student is ineligible, the length of time and events, which apply to each violation and the responsibilities of the student during those periods.
5. **Develop the Procedures for Due Process:** Specify the procedures by which the school officials will investigate reported violations of the rules and apply the consequences for confirmed violations.
6. A Code of Conduct would define the time during which the rule is in effect, include the parameters of use, possession, intent to buy or sell, transmit, etc., and the consequences of a violation.

**Sample Rule for a Model Code of Conduct:** A sample of a rule, which incorporates the standards, cited above could read:

“Regardless of the quantity, a student shall not: 1) use a beverage containing alcohol, 2) use tobacco; or 3) use or consume, have in possession, buy, sell or give away any other controlled substance.”

**Sample of Consequences for Violations of the Rule:** Consequences for rule violations should incorporate the following standards:

1. **A Standard of Certainty:** An expectation by those to be affected by the rule that it will be applied with a measure of consistency and uniformity to all involved.
2. **A Standard of Severity:** An expectation that the consequences for the violation are fair for the act committed and that those affected will be encouraged to follow through with the consequences, including coaches, students, and parents.
3. **A Standard of Promptness:** An expectation that the due process will promptly be applied following an alleged violation.

## **Sect. 7: Medical Appliances**

When it is necessary for an athlete to wear a medical appliance (such as an insulin pump) during athletic competitions, the device shall be padded and securely attached to the player’s body underneath the uniform. Devices attached to the head (such as hearing aids and cochlear implants) do not need to be padded, but firmly secured to the body. No medical appliance should pose a risk of injury to others. It is recommended that the athlete notify the official of the presence of the medical appliance prior to a contest.

## **Sect. 8: Mouth Guards (CM 5.2021):**

- The NFHS/NHIAA mandates the use of mouthguards in football, field hockey, ice hockey, lacrosse and wrestling (for wrestlers wearing braces). While not mandated, the NHIAA also highly recommends the use of mouthguards in soccer and basketball. Multiple studies by the American Dental Association, the American Academy of Pediatric Dentistry, and the American Academy for Sports Dentistry have shown a significant reduction of orofacial injuries with the use of a properly fitted mouthguard.
- A properly fitted mouthguard should separate the biting surfaces of the teeth, protect the lips, gums and teeth, and fully cover all of the upper teeth. Mouthguards which cover the lower, rather than the upper, teeth are preferred if the lower row of teeth protrudes farther out (are the leading edge) than the upper teeth. It is strongly recommended that mouthguards be properly fitted and not be altered in any manner which decreases the effective protection. Proper fit is insured by: (1) being constructed from a model made from an impression of the individual’s teeth or (2) being constructed and fitted to the individual by impressing the teeth into the mouthguard itself.
- A properly fitted and unaltered mouthguard has been shown to not impede communication, breathing, or create any hazards to the airway or oral cavity
- Research currently does not support the theory that the use of a mouthguard minimizes the risk or severity of a concussion.

## **Sect. 9: Eye Protection**

Eye protection must follow individual sport specific guidance per the NFHS. Eye protection may be deemed medically necessary in other sports by a physician. Any adaptation to equipment must be commercially made and approved by the manufacture of the basic equipment i.e. an eye guard may be required or used on a football helmet as long as it is made and approved for that specific helmet. Helmet eye shields must be non-reflective and clear only. (CM 5.2021)

## **Sect. 10: Outdoor Environmental Safety**

**Lightning/Thunder:** Lightning is the most consistent and significant weather hazard that may affect outdoor athletics. Within the United States, the National Severe Storm Laboratory (NSSL) estimates that 100 fatalities and 400-500 injuries requiring medical treatment occur from lightning strikes every year. The existence of blue sky and the absence of rain are not protection from lightning. Lightning can, and does, strike as far as ten (10) miles away from the rain shaft. It does not have to be raining for lightning to strike. Additionally, thunder always accompanies lightning, even though its audible range can be diminished due to background noise in the immediate environment, and its distance from the observer.

The following guidelines are mandated:

- A. All athletic staff and game personnel are to monitor threatening weather. The decision to remove a team or individual from athletic sites or events will include athletic/site/event director, game officials/umpires, and sports medicine staff. An emergency plan should include planned instructions for participants as well as spectators. (CM 5/2019)
- B. Be aware of potential thunderstorms that may form during scheduled athletic events or practices. Included here should include National Weather Service – issued (NWS) thunderstorm “watches” and “warnings” as well as signs of thunderstorms developing nearby. A “watch” means conditions are favorable for severe weather to develop in an area; a “warning” means that severe weather has been reported in an area and for everyone to take proper precautions.
- C. Know where the closest “safe structure or location” is to the field or playing area, and know how long it takes to get to that safe structure or location.

### **Safe structure or location is defined as:**

- Any building normally occupied or frequently used by people, i.e., a building with plumbing and /or electrical wiring that acts to electrically ground the structure. Avoid using shower facilities for safe shelter and do not use the showers or plumbing facilities during a thunderstorm.
  - In the absence of a sturdy, frequently inhabited building, any vehicle with a hard metal roof (not a convertible or golf cart) and rolled up windows can provide a measure of safety. A vehicle is certainly better than remaining outdoors. It is not the rubber tires that make a vehicle safe shelter, but the hard metal roof, which dissipates the lightning strike around the vehicle. Do not touch the sides of the vehicle!
- D. When you first hear thunder or see lighting, suspend activities and go to a safe shelter or location. “If you can see it (lightning), flee it (take shelter). If you can hear it (thunder) clear it (suspend activities).” Wait until 30 minutes after the last observed lightning or thunder before resuming activities.
  - E. If no safe structure or location is within a reasonable distance, find a thick grove of small trees surrounded by taller trees or a dry ditch. Assume a crouched position on the ground with only the balls of the feet touching the ground, wrap your arms around your knees and lower your head. Minimize contact with the ground, because lightning current often enters a victim through the ground rather than by a direct overhead strike. Minimize your body’s surface area, and minimize contact with the ground! Do not lie flat! Stay away from the tallest trees or objects (such as light poles or flag poles), metal objects (such as bleachers or fences), individual trees, standing pools of water, and open fields. Avoid being the highest object in a field. Do not take shelter under a single, tall tree.

## **Sect. 11: Guidelines on Ozone Pollution and Physical Activity**

School Administrators and coaches as well as other appropriate staff are to use this document in making decisions regarding indoor and outdoor activities during periods of high ozone pollution.

**Contact Information:** Air Quality Action Day Contact person is Kathy Brockett ([kathleen.brockett@des.nh.gov](mailto:kathleen.brockett@des.nh.gov)) (603) 271-6284. The following website provides air quality data by county in NH; [http://www2.des.state.nh.us/airdata/air\\_quality\\_forecast.asp](http://www2.des.state.nh.us/airdata/air_quality_forecast.asp)

Email alert for Air Quality Action days are available through the **EnviroFlash** system, a service provided jointly by EPA and DES. EnviroFlash is a notification system that sends e-mail, text, or pager messages with air quality information such as forecasts and Air Quality Action Day announcements.

EnviroFlash is available statewide in New Hampshire. It is a quick, simple way to stay informed about air quality conditions in your region. This service is especially helpful for people who are at greater risk from air pollution, including children, older adults, and people with heart or lung diseases. To sign up for EnviroFlash, visit [www.enviroflash.info/](http://www.enviroflash.info/). You can sign up to receive just **Air Quality Action Day messages** or to receive forecasts at various air quality levels based on your location.

### Charting Air Quality

Local officials use a simple scale to forecast and report on smog levels and other air pollution. Depending on where you live, it might be called Air Quality Index (AQI) or Pollutant Standards Index (PSI).

Current air quality is reported as a percentage of the federal health standard for a pollutant. If the current index is above 100, air pollution exceeds the level considered safe.

At Ozone smog levels above 100, children, asthmatics and other sensitive groups should limit strenuous exercise. Even otherwise healthy people should consider limiting vigorous exercise when ozone levels are at or above the health standard.

If the index is above 200, corresponding to an ozone pollution level of .20 parts per million (ppm), the pollution level is judged unhealthy for everyone. At this level, air pollution is a serious health concern. Everyone should avoid strenuous outdoor activity, as respiratory tract irritation can occur.

### U.S. EPA Air Quality Index

<b>Index Value</b>	<b>Descriptor</b>	<b>Color</b>	<b>1 hr. Ozone ppb</b>
0 – 50	Good	Green	---
51 – 100	Moderate	Yellow	---
101 – 150	Unhealthy for Sensitive Groups	Orange	125 – 164
151 – 200	Unhealthy	Red	165 – 204
201 – 300	Very Unhealthy	Purple	205 – 404
301 – 500	Hazardous	Maroon	405 – 604

### Observing Air Quality

- A. **Watch the Calendar:** Ozone smog tends to be worst during the May - September “smog season.” Be especially conscious of smog levels during warm weather. In warm areas, smog can be a problem at any time of the year. Carbon monoxide pollution levels also are related to the weather, as well as to altitude. In the western U.S., the highest carbon monoxide levels are found in the winter months.
- B. **Watch the Clock:** Since sunlight and time are necessary for ozone smog formation, the highest levels of ozone typically occur during the afternoon. Since carbon monoxide is produced primarily by motor vehicles, the highest carbon monoxide levels usually occur during rush hour or during other traffic congestion situations.
- C. **Watch the News**

### Guidelines for Participation

- A. Observe appropriate physical activity restrictions represented above.

- B. If an ozone exceedance is expected, but has not yet occurred at the time an interscholastic practice or contest is scheduled to begin, that event may begin as scheduled.
- C. If an interscholastic practice or contest is scheduled to begin and an E.P.A. warning is in effect (PSI 201 or higher), the event shall be cancelled, delayed or rescheduled.

When ozone levels reach a national PSI level of 201 (.201 parts per million), exercising indoors or outdoors may cause significant respiratory tract irritation and a decline in lung function. Therefore, strenuous exercise indoors and outdoors is to cease.

### **Recommended Restriction of Physical Activity**

The following limits on activity for each type of episode are as follows:

- **Level Orange, PSI 101-150 (Unhealthy for Sensitive Groups)**
  1. Active children and adults and people with heart or respiratory disease, such as asthma or allergies, should limit prolonged outdoor exertion.
  2. Healthy individuals with noticeable health effects associated with existing conditions should minimize outdoor activity.
- **Level Red, PSI 151-200 (Unhealthy)**
  1. All athletes should discontinue prolonged, vigorous exercise indoors and outdoors.
  2. Sensitive individuals, primarily children who are active outdoors and people with heart or respiratory disease such as asthma or allergies, should avoid indoor and outdoor activity.
  3. Indoor and outdoor activities that should be avoided include, but are not limited to, calisthenics, basketball, baseball, running, field hockey, soccer, football, tennis, swimming and diving.
  4. Required restriction of physical activity.
- **Level Purple, PSI 201-300 (Very Unhealthy)**
  1. All athletes shall discontinue vigorous indoor and outdoor activities, regardless of duration.
  2. All indoor and outdoor physical education classes, sports practices and athletic competitions shall be rescheduled.

Note: Indoor practices may be held if an air-conditioned facility is available.

### **Sect. 12: Heat Stress and Athletic Participation**

Early fall football, cross country, soccer and field hockey practices are conducted in very hot and humid weather in many parts of the United States. Due to the equipment and uniform needed in football, most of the heat problems have been associated with football. During the 1998 season, there were four heat stroke deaths in football. There are no excuses for deaths if the proper precautions are taken. During hot weather, the athlete is subject to the following:

**HEAT CRAMPS** - Painful cramps involving abdominal muscles and extremities caused by intense, prolonged exercise in the heat and depletion of salt and water due to profuse sweating.

**HEAT SYNCOPE** - Weakness, fatigue, and fainting due to loss of salt and water in sweat and exercise in the heat. Predisposes to heat stroke.

**HEAT EXHAUSTION (WATER DEPLETION)** - Excessive weight loss, reduced sweating, elevated skin and core body temperature, excessive thirst, weakness, headaches and sometimes unconsciousness.

**HEAT STROKE** - An acute medical emergency related to thermoregulatory failure. Associated with nausea, seizures, disorientation, and possible unconsciousness or coma. It may occur suddenly without being preceded by any other clinical signs. The individual is usually unconscious with a high body temperature and a hot dry skin (heat stroke victims, contrary to popular belief, may sweat profusely).

It is believed that the above-mentioned heat stress problems can be controlled provided certain precautions are taken. According to the American Academy of Pediatrics Committee on Sports Medicine, heat related illnesses are all preventable. (Sports Medicine: Health Care for Young Athletes, American Academy of Pediatrics, 1991). **The following practices and precautions are recommended:**

1. Each athlete should have a physical exam with a medical history when first entering a program and an annual health history update. History of previous heat illness and type of training activities before organized practice begins should be included. State high school association's recommendations should be followed. (By-Law Article III; Sect. 2A)
2. It is clear that top physical performance can only be achieved by an athlete who is in top physical condition. Lack of physical fitness impairs the performance of an athlete who participates in high temperatures. Coaches should know the PHYSICAL CONDITION of their athletes and set practice schedules accordingly
3. Along with physical conditioning, the factor of acclimatizing to heat is important. Acclimatization is the process of becoming adjusted to the heat and it is essential to provide for GRADUAL ACCLIMATIZATION TO HOT WEATHER. It is necessary for an athlete to exercise in the heat if he/she is to become acclimatized to it. It is suggested that a graduated physical conditioning program be used and that 80 percent acclimatization can be expected to occur after the first seven (7) to ten (10) days. Final states of acclimatization can be expected to occur after the first seven (7) to ten (10) days. Final stages of acclimatization to heat are marked by increased sweating and reduced salt concentration in the sweat.
4. The old idea that water should be withheld from athletes during workouts has NO SCIENTIFIC FOUNDATION. The most important safeguard to the health of an athlete is the replacement of water. Water must be on the field and readily available to athletes at all times. It is recommended that a minimum of 10 minutes be scheduled for a water break every half hour of heavy exercise in the heat. WATER SHOULD BE AVAILABLE IN UNLIMITED QUANTITIES. Check and be sure athletes are drinking the water. Cold water is preferable. Drinking ample water before practices and games has also been found to aid performance in the heat.
5. Salt should be replaced daily. Modest salting of foods after practice or games will accomplish this purpose. Salt tablets are not recommended. ATTENTION MUST BE DIRECTED TO REPLACING WATER—FLUID REPLACEMENT IS ESSENTIAL.
6. Know both the TEMPERATURE and the HUMIDITY. The greater the humidity, the more difficult it is for the body to cool itself. Test the air prior to practice or game using a wet bulb, globe, relative humidity index (WBGT Index) which is based on the combined effects of air temperature, relative humidity, radiant heat and air movement. The following precautions are recommended when using the WBGT Index (ACSM's Guidelines for the Team Physician, 1991):
  - Below 64...unlimited activity
  - 65-72.... moderate risk
  - 74-82.... high risk
  - 82+...very high risk

There is also a weather guide for activities that last for 30 minutes or more (Fox Matthews, 1981) which involves knowing the relative humidity and air temperature.

AIR TEMP	DANGER ZONE	CRITICAL ZONE
70 F	80% RH	100% RH
75 F	70% RH	100% RH
80 F	50% RH	80% RH
85 F	40% RH	68% RH
90 F	30% RH	55% RH
95 F	20% RH	40% RH
100 F	10% RH	30% RH

RH = Relative Humidity

One other method of measuring the relative humidity is the use of a sling psychrometer which measures the bulb temperature. The wet bulb temperature should be measured prior to practice and the intensity and duration of practice adjusted accordingly. Recommendations are as follows:

Under 60 F...safe but always observe athletes

61-65 F.....observe players carefully

66-70 F.....caution

71-71 F.....shorter practice sessions and more frequent water and rest breaks

75 + F.....danger level and extreme caution

7. Cooling by evaporation is proportional to the area of the skin exposed. In extremely hot and humid weather, reduce the amount of clothing covering the body as much as possible. NEVER USE RUBBERIZED CLOTHING.
8. Athletes should weight in each day before and after practice and WEIGHT CHARTS CHECKED. Generally, a 3% weight loss through sweating is safe and over a 3% weight loss is in the danger zone. Over a 3% weight loss that athlete should not be allowed to practice in hot and humid conditions. Observe the athletes closely under all conditions. Do not allow athletes to practice until they have adequately replaced their weight.
9. Observe athletes carefully for signs of trouble; particularly athletes who lose significant weight and the eager athlete who constantly competes are his/her capacity. Some trouble signs are nausea, incoherence, fatigue, vomiting, cramps, weak rapid pulse, visual disturbance and unsteadiness.
10. Teams that encounter hot weather during the season through travel or following and unseasonably cool period should be physically fit but will not be environmentally fit. Coaches in this situation should follow the above recommendations and substitute more frequently during games.
11. Know what to do in case of an emergency and have your emergency plans written with copies to all of your staff. Be familiar with immediate first aid practice and prearranged procedures for obtaining medical care, including ambulance service.

### **HEAT STROKE – *This is a medical emergency- DELAY COULD BE FATAL.***

Immediately cool the body while waiting for transfer to the hospital. Remove clothing and place ice bags on the neck in the axilla (armpit) and on the groin area. An increasing number of medical personnel are now using a treatment for heat illness that involves applying either alcohol or cool water to the victim's skin and vigorously fanning the body. The fanning causes evaporation and cooling. (Source, The First Aider – September 1987).

**HEAT EXHAUSTION – *OBTAIN MEDICAL CARE AT ONCE.*** Cool the body as you would for heat stroke while waiting for transfer to the hospital. Give fluids if athlete is able to swallow and is conscious.

**SUMMARY –** The main problem associated with exercising in the hot weather is water loss through sweating. Water loss is best replaced by allowing the athlete unrestricted access to water. Water breaks two or three times per hour is better than one break an hour. Probably the best method is to have water available at all times and allow athletes to drink water whenever he/she needs it. Never restrict the amount of water an athlete drinks, and be sure the athletes are drinking the water. The small amount of salt lost in sweat is adequately replaced by salting foods at meals. Talk to your medical personnel concerning emergency treatment plans. (Reprinted with permission from NFHS)

### **HEAT ACCLIMATIZATION -**

- A minimum of three (3) practice days before interscholastic scrimmaging
- A minimum length of time between practices (3 hours)

## **Sect. 13: Concussions**

### **NHIAA Adopts the NFHS Guidelines For Management Of Concussions In Sports**

At the November 2012 Meeting of the NHIAA Sport Medicine Committee and subsequently confirmed by the NHIAA Council in December 2012 the guidelines regarding concussion management as published by the National Federation of State High School Associations in 2011, were adopted as **mandatory minimum standards** to be utilized by all NHIAA member schools. Schools may adopt more restrictive guidelines or protocols but under no circumstances can the NHIAA guidelines be diluted especially where specific actions are mandated. Specifically, schools must minimally follow items 1 and 2 under “Sideline Decision Making” found in the “Management of Concussions and Return to Play” section of this document. All individuals involved in interscholastic athletics are encouraged to carefully study and make themselves aware of these guidelines.

The NHIAA website also has more in depth information on this topic (NH Advisory Council on Sport-Related Concussion issues a “Consensus Statement”). Bottom line, new research has made the medical community much more aware of the significant dangers related to sports related head injuries. The days of getting a “ding” or “Having your bell rung” and then returning to play are long gone.

### **NFHS Suggested Guidelines for Management of Concussion In Sports**

National Federation of State High School Associations

PO Box 690, Indianapolis, IN 46206

#### **Introduction**

A concussion is type of traumatic brain injury that interferes with normal function of the brain. It occurs when the brain is rocked back and forth or twisted inside the skull as a result of a blow to the head or body. What may appear to be only a mild jolt or blow to the head or body can result in a concussion.

The understanding of sports-related concussion has evolved dramatically in recent years. We now know that young athletes are particularly vulnerable to the effects of a concussion. Once considered little more than a “ding” on the head, it is now understood that a concussion has the potential to result in short or long-term changes in brain function, or in some cases, death.

#### **What is a concussion?**

You’ve probably heard the terms “ding” and “bell-ringer.” These terms were once used to refer to minor head injuries and thought to be a normal part of sports. There is no such thing as a minor brain injury. Any suspected concussion must be taken seriously. A concussion is caused by a bump, blow, or jolt to the head or body. Basically, any force that is transmitted to the head causes the brain to literally bounce around or twist within the skull, potentially resulting in a concussion.

What exactly happens to the brain during a concussion is not entirely understood. It appears to be a very complex injury affecting both the structure and function of the brain. The sudden movement of the brain causes stretching and tearing of brain cells, damaging the cells and creating chemical changes in the brain. Once this injury occurs, the brain is vulnerable to further injury and very sensitive to any increased stress until it fully recovers.

Common sports injuries such as torn ligaments and broken bones are structural injuries that can be seen on MRIs or x-rays, or detected during an examination. A concussion, however, is primarily an injury that interferes with how the brain works. While there is damage to brain cells, the damage is at a microscopic level and cannot be seen on MRI or CT scans. Therefore, the brain looks normal on these tests, even though it has been seriously injured.

#### **Recognition and Management**

If an athlete exhibits any signs, symptoms, or behaviors that make you suspicious that he or she may have had a concussion, that athlete must be removed from all physical activity, including sports and recreation.

Continuing to participate in physical activity after a concussion can lead to worsening concussion symptoms, increased risk for further injury, and even death.

**SYMPTOMS REPORTED BY ATHLETE**

Headache  
Nausea  
Balance problems or dizziness  
Double or fuzzy vision  
Sensitivity to light or noise  
Feeling sluggish  
Feeling foggy or groggy  
Concentration or memory problems  
Confusion

Parents and coaches are not expected to be able to “diagnose” a concussion. That is the role of an appropriate health-care professional. However, you must be aware of the signs, symptoms and behaviors of a possible concussion, and if you suspect that an athlete may have a concussion, then he or she must be immediately removed from all physical activity.

**SIGNS OBSERVED BY PARENTS, FRIENDS, TEACHERS OR COACHES**

Appears dazed or stunned  
Is confused about what to do  
Forgets plays  
Is unsure of game, score, or opponent  
Moves clumsily  
Answers questions slowly  
Loses consciousness  
Shows behavior or personality changes  
Can’t recall events prior to hit  
Can’t recall events after hit

## When in doubt sit them out!

When you suspect that a player has a concussion, follow the “Heads Up” 4-step Action Plan.

1. Remove the athlete from play.
2. Ensure that the athlete is evaluated by an appropriate health-care professional.
3. Inform the athlete’s parents or guardians about the possible concussion and give them information on concussion.
4. Keep the athlete out of play the day of the injury and until an appropriate health-care professional says he or she is symptom-free and gives the okay to return to activity.

The signs, symptoms, and behaviors of a concussion are not always apparent immediately after a bump, blow, or jolt to the head or body and may develop over a few hours. An athlete should be observed following a suspected concussion and should never be left alone.

Athletes must know that they should never try to “tough out” a suspected concussion. Teammates, parents and coaches should never encourage an athlete to “play through” the symptoms of a concussion. In addition, there should never be an attribution of bravery to athletes who do play despite having concussion signs or symptoms. The risks of such behavior must be emphasized to all members of the team, as well as coaches and parents.

If an athlete returns to activity before being fully healed from an initial concussion, the athlete is at risk for a repeat concussion. A repeat concussion that occurs before the brain has a chance to recover from the first can slow recovery or increase the chance for long-term problems. In rare cases, a repeat concussion can result in severe swelling and bleeding in the brain that can be fatal.

### Cognitive Rest

A concussion can interfere with school, work, sleep and social interactions. Many athletes who have a concussion will have difficulty in school with short- and long-term memory, concentration and organization. These problems typically last no longer than a week or two, but for some these difficulties may last for months. It is best to lessen the student’s class load early on after the injury. Most students with concussion recover fully. However, returning to sports and other regular activities too quickly can prolong the recovery.

The first step in recovering from a concussion is rest. Rest is essential to help the brain heal. Students with a concussion need rest from physical and mental activities that require concentration and attention as these activities may worsen symptoms and delay recovery. Exposure to loud noises, bright lights, computers, video games, television and phones (including texting) all may worsen the symptoms of concussion. As the symptoms lessen, increased use of computers, phone, video games, etc., may be allowed.

### Return to Play

After suffering a concussion, **no athlete should return to play or practice on that same day.** Previously, athletes were allowed to return to play if their symptoms resolved within 15 minutes of the injury. Newer studies have shown us that the young brain does not recover quickly enough for an athlete to return to activity in such a short time.

**An athlete should never be allowed to resume physical activity following a concussion until he or she is symptom free and given the approval to resume physical activity by an appropriate health-care professional.**

Once an athlete no longer has signs, symptoms, or behaviors of a concussion **and is cleared to return to activity by a health-care professional**, he or she should proceed in a step-wise fashion to allow the brain to re-adjust to exercise. In most cases, the athlete will progress one step each day. The return to activity program schedule **may** proceed as below **following medical clearance:**

### ***Progressive Physical Activity Program***

*Step 1:* Light aerobic exercise - 5 to 10 minutes on an exercise bike or light jog; no weight lifting, resistance training, or any other exercises.

*Step 2:* Moderate aerobic exercise - 15 to 20 minutes of running at moderate intensity in the gym or on the field without a helmet or other equipment.

*Step 3:* Non-contact training drills in full uniform. May begin weight lifting, resistance training, and other exercises.

*Step 4:* Full contact practice or training.

*Step 5:* Full game play.

**If symptoms of a concussion re-occur, or if concussion signs and/or behaviors are observed at any time during the return to activity program, the athlete must discontinue all activity and be re-evaluated by their health care provider.**

### **Concussion in the Classroom**

Following a concussion, many athletes will have difficulty in school. These problems may last from days to months and often involve difficulties with short and long-term memory, concentration, and organization. In many cases, it is best to lessen the student's class load early on after the injury. This may include staying home from school for a few days, followed by a lightened schedule for a few days, or longer, if necessary. Decreasing the stress on the brain early on after a concussion may lessen symptoms and shorten the recovery time.

### **What to do in an Emergency**

Although rare, there are some situations where you will need to call 911 and activate the Emergency Medical System (EMS). The following circumstances are medical emergencies:

1. Any time an athlete has a loss of consciousness of any duration. While loss of consciousness is not required for a concussion to occur, it may indicate more serious brain injury.
2. If an athlete exhibits any of the following: decreasing level of consciousness, looks very drowsy or cannot be awakened, if there is difficulty getting his or her attention, irregularity in breathing, severe or worsening headaches, persistent vomiting, or any seizures.

### **Suggested Concussion Management**

1. No athlete should return to play (RTP) or practice on the same day of a concussion.
2. Any athlete suspected of having a concussion should be evaluated by an appropriate health-care professional that day.
3. Any athlete with a concussion should be medically cleared by an appropriate health-care professional prior to resuming participation in any practice or competition.
4. After medical clearance, RTP should follow a step-wise protocol with provisions for delayed RTP based upon return of any signs or symptoms.

### **References**

Guskiewicz KM, et al. National Athletic Trainers' Association position statement: management of sport-related concussion. *Journal of Athletic Training* 2004; 39:280-297.

McCrary P, et al. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *Journal of Athletic Training* 2009; 44:434-48.

### **Additional Resources**

Heads Up: Concussion in High School Sports. [http://www.cdc.gov/concussion/headsup/high\\_school.html](http://www.cdc.gov/concussion/headsup/high_school.html)  
Concussion in Sports- What you need to know.

<http://www.nfhslearn.com/electiveDetail.aspx?courseID=15000>

NFHS Sports Medicine Handbook, 4th Ed, 2011.

**Revised January 2011**

**NOTE:** Schools are reminded that on June 18, 2012 the New Hampshire Legislation (General Court) passed legislation regarding “Head Injury Policies for Student Sports.” RSA 200, Sections: 49-52 was effective on August 17, 2012 and amended 2014. Although the NHIAA By-Law would appear to require a higher standard, schools are urged to review this statute and ensure compliance as it obviously supersedes the NHIAA By-Laws if more restrictive. Schools should note that the State Law requires parental permission in addition to written medical clearance prior to allowing a concussed student athlete to return to play.

**Sect. 14: Jewelry and Body Piercing Rule**

The NHIAA follows the NFHS Rules regarding jewelry. The general rule for all sports is as follows: “No jewelry, which includes body-piercing objects, shall be worn. Religious or medical alert medals must be properly secured under the uniform. Dermal Piercings - These piercings are inserted into the skin and require a medical procedure to remove them. The decorative part screws onto the pin or screw that protrudes from the skin. Even with a bandage over it would seem to pose a potential hazard.” **Each sport shall review their sport rulebook for “additional restrictions”.**