

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) (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

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/. 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

Index Value	Descriptor	Color	1 hr. Ozone ppb
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 weigh 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

In 2012 the state of New Hampshire enacted state law pertaining to “Head Injury Policies for Student Sports”, RSA 200:50. The text of the law is provided below:

Head Injury Policies for Student Sports

Section 200:50

200:50 Removal of Student-Athlete. –

- I. A school employee coach, official, licensed athletic trainer, or health care provider who suspects that a student-athlete has sustained a concussion or head injury in a practice or game shall remove the student-athlete from play immediately.
- II. A student-athlete who has been removed from play shall not return to play on the same day or until he or she is evaluated by a health care provider and receives medical clearance and written authorization from that health care provider to return to play. The student-athlete shall also present written permission from a parent or guardian to return to play.
- III. No person who authorizes a student-athlete to return to play shall be liable for civil damages resulting from any act or omission in the rendering of such care, other than acts or omissions constituting gross negligence or willful or wanton misconduct.

Source. 2012, 234:2, eff. Aug. 17, 2012.

In an effort to assist schools in the management of concussions the NHIAA adopted the NFHS Guidelines for Management of Concussions in Sports. This document has been modified from its original form to reflect mandates enacted through RSA 200:50. Such modifications are highlighted and annotated.

SUGGESTED GUIDELINES FOR MANAGEMENT OF CONCUSSION IN SPORTS

National Federation of State High School Associations (NFHS)
Sports Medicine Advisory Committee (SMAC)

Introduction

A concussion is a type of traumatic brain injury that impairs the function of the brain. It occurs when the brain moves within 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 or other serious brain injury.

The understanding of sports-related concussion continues to evolve. We now know that young athletes are particularly vulnerable to the effects of a concussion. Once considered a “ding” to the head, it is now understood that a concussion has the potential to result in a variety of short- or long-term changes in brain function and, rarely, death.

What is a concussion?

A concussion is a traumatic brain injury that interferes with the normal function of the brain. Simply stated – a concussion results from an injury to the brain, and there is no such thing as a minor brain injury!

Concussions should never be referred to as a “ding” or a “bell-ringer.” Any suspected concussion must be taken very seriously.

An athlete does not need to lose consciousness (be “knocked-out”) to suffer a concussion. In fact, less than 5% of concussed athletes suffer a loss of consciousness.

What happens to the brain during a concussion is not completely understood. It is a complex process, primarily affecting the 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 increase in stress, such as another head injury, until it fully recovers.

Common sports injuries such as torn ligaments and broken bones are structural injuries that can be seen on x-rays or MRI. A concussion, however, is an injury that interferes with how the brain works and cannot be seen on MRI or CT scans. Therefore, even though the brain is injured, the brain looks normal on these tests.

Recognition and Management

If an athlete exhibits any signs, symptoms, or behaviors that make you suspicious of a concussion, the athlete must be removed from play and not be allowed to return to play until they are evaluated and cleared by a health-care professional. Failure to remove the athlete from activity puts them at risk for sustaining another head injury while concussed, which can lead to worsening concussion symptoms, increased risk for further injury, and, sometimes even death.

Parents/guardians and coaches are not expected to “diagnose” a concussion. However, everyone involved in athletics must be aware of the signs, symptoms and behaviors associated with a concussion. If you suspect that an athlete may have a concussion, then the athlete must be immediately removed from all physical activity.

Signs Observed by Coaching Staff

- Dazed or stunned appearance.
- Confusion about assignment or position.
- Forgetfulness.
- Uncertainty of game, score, or opponent.
- Clumsy movements.
- Slow response to questions.
- Mood, behavior or personality changes.
- Can't recall events prior to or after hit or fall.

Symptoms Reported by Athlete

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

When in doubt sit them out!

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

1. Remove the athlete from play.
2. Ensure the athlete is evaluated by an appropriate health-care professional.
3. Inform the athlete’s parents/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 has given written clearance that the athlete is symptom-free and may return to activity. NH RSA 200:50 mandates that the student-athlete shall also present written permission from a parent or guardian to return to play.

The signs and symptoms associated with a concussion are not always apparent immediately after a bump, blow, or jolt to the head or body and may develop up to 36 hours afterwards. However, until an athlete is evaluated by an appropriate health-care professional, they should be closely watched following a suspected concussion and should not be left alone.

Athletes should never try to “tough out” a concussion. Teammates, parents/guardians, and coaches should never encourage an athlete to “play through” the symptoms of a concussion. This can worsen concussion symptoms and prolong recovery. In addition, there should never be an attribution of bravery or courage to athletes who play despite having concussion signs and/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, their reaction time and reflexes may be compromised, placing the athlete at greater risk for sustaining another head injury. A second injury that occurs before the brain has a chance to recover from the initial concussion will delay recovery and increase the chance for long-term problems. In rare cases, a repeat head injury can result in severe swelling and bleeding in the brain, known as Second Impact Syndrome which can be fatal.

What Are Some Danger Signs to Look Out For?

In rare cases, a dangerous collection of blood (hematoma) may form between the brain and skull after a bump, blow, or jolt to the head or body. The pressure from this blood can squeeze the brain within the skull. Call 9-1-1 for any athlete that demonstrates any of the following signs or symptoms after a bump, blow, or jolt to the head or body for transport to the emergency department:

- One pupil larger than the other.
- Drowsiness or inability to wake up.
- A headache that gets worse and does not go away.
- Slurred speech, weakness, numbness, or decreased coordination.
- Repeated vomiting or nausea
- Convulsions or seizures (shaking or twitching).
- Unusual behavior, increased confusion, restlessness, or agitation.
- Loss of consciousness (passed out/knocked out). Even a brief loss of consciousness should be taken seriously.

Management Until Recovery

Rest

The first step in recovering from a concussion is rest. Rest is essential to help the brain heal. Athletes 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. Athletes typically require 24-48 hours of rest, though some may require a longer period of time.

Activity

Research has shown that getting lightly active can help increase blood flow to the brain and decrease recovery time from a concussion. After the initial period of rest for 24 – 48 hours, athletes may engage in light to moderate cardiovascular activities, such as 30-45 minutes of walking or jogging at an easy pace. At light to moderate cardiovascular exertion level, athletes are still able to speak full sentences. They may continue this as long as symptoms do not worsen following physical activity.

Return to Learn

Following a concussion, many athletes will have difficulty in school. These problems may last from days to weeks 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 during the short period of rest (typically no more than 1-2 days) followed by a lighter school schedule for a few days, or longer, if necessary. Decreasing the stress to the brain in the early phase after a concussion may lessen symptoms and shorten the recovery time. Additional academic adjustments may include decreasing homework, allowing extra time for assignments/tests, and taking breaks during class. Such academic adjustments are best made using a team approach collaborating with teachers, counselors, and school nurses.

Return to Play

After suffering a concussion, no athlete should return to play or practice on that same day. An athlete should never be allowed to resume play following a concussion until symptom free and given the approval to resume physical activity by an appropriate health-care professional. Once an athlete no longer has signs or symptoms of a concussion and is cleared to return to activity by an appropriate health-care professional, they should proceed in a step-wise fashion to allow the brain to re-adjust to exercise. In most cases, the athlete should progress no more than one step each day, and at times each step may take more than one day. Below is an example of a return to physical activity program:

Progressive Return to Play Protocol

Step 1: Back to Regular Activities (such as school)

To enter into the stepwise return to play protocol the athlete should first be back to regular activities (such as School, taking tests and quizzes without worsening symptoms) and has been cleared by their appropriate health-care professional to begin the return to play process. In most all cases, the athlete should have all concussion-related academic adjustments removed prior to beginning the Return to Sports Activity Program

Step 2: Light Aerobic Activity

Begin with light aerobic exercise only to increase heart rate. This means about 5 to 10 minutes on an exercise bike, brisk walking, or light jogging. No anaerobic activity such as weight lifting should be done at this stage.

Step 3: Moderate Activity

Continue with activities that increase an athlete's heart rate while adding movement. This includes running and skating drills.

Step 4: Non-Contact Training Activity

Add sports specific, more intense, non-contact physical activity, such as passing in hockey, dribbling in basketball or soccer, high-intensity stationary biking, regular weightlifting routine.

Step 5: Practice and Full Contact

The athlete may return to practice and full contact (if appropriate for the sport) in a controlled practice setting where the skills can be assessed by the coaches.

Step 6: Competition

The athlete may return to competition.

If symptoms of a concussion recur, or if concussion signs and/or behaviors are observed at any time during the return-to-play program, the athlete must discontinue all activity immediately. The athlete may need to be re-evaluated by the appropriate health-care professional or may have to return to the previous step of the return-to-activity program, as pre-determined by the appropriate health-care professional.

Summary of 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.
3. Any athlete diagnosed with a concussion should have written clearance from an appropriate health-care professional prior to resuming participation in any practice or competition. NH RSA 200:50 mandates that the student-athlete shall also present written permission from a parent or guardian to return to play.
4. After medical clearance, RTP should follow a step-wise protocol as outlined above with provisions for delayed RTP based upon return of any signs or symptoms.

References:

- Halstead ME, Walter KD, Moffatt K; COUNCIL ON SPORTS MEDICINE AND FITNESS. Sport-Related Concussion in Children and Adolescents. *Pediatrics*. 2018 Dec;142(6). pii: e20183074. doi:10.1542/peds.2018-3074. Epub 2018 Nov 12.
- McCrory P, Meeuwisse W, Dvořák J, Aubry M, Bailes J, Broglio S, Cantu RC, Cassidy D, Echemendia RJ, Castellani RJ, Davis GA, Ellenbogen R, Emery C, Engebretsen L, Feddermann-Demont N, Giza CC, Guskiewicz KM, Herring S, Iverson GL, Johnston KM, Kissick J, Kutcher J, Leddy JJ, Maddocks D, Makhadmeh M, Manley GT, McCrea M, Meehan WP, Nagahiro S, Patricios J, Putukian M, Schneider KJ, Sills A, Tator CH, Turner M, Vos PE. Consensus statement on concussion in sport-the 5th international conference on concussion in sport held in Berlin, October 2016. *Br J Sports Med*. 2017 Jun;51(11):838-847. doi: 10.1136/bjsports-2017-097699. Epub 2017 Apr 26.

Additional Resources:

- Brain 101 – The Concussion Playbook.
- Concussion in Sports- What you need to know.
- <https://nfhslearn.com/courses/61151/concussion-in-sports>
- Heads Up: Concussion in High School Sports
- http://www.cdc.gov/concussion/headsup/high_school.html
- REAP Concussion Management Program.
- NH RSA 200:50 “Head Injury Policies for Student Sports”

<http://www.rockymountainhospitalforchildren.com/sports-medicine/concussion-management/reap-guidelines.htm>

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January 2011

April 2009

October 2008

October 2005

DISCLAIMER – NFHS Position Statements and Guidelines

The NFHS regularly distributes position statements and guidelines to promote public awareness of certain health and safety-related issues. Such information is neither exhaustive nor necessarily applicable to all circumstances or individuals and is no substitute for consultation with appropriate health-care professionals.

Statutes, codes or environmental conditions may be relevant. NFHS position statements or guidelines should be considered in conjunction with other pertinent materials when taking action or planning care. The NFHS reserves the right to rescind or modify any such document at any time.

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”.**