

ADDENDUMS

Health & Safety

Hydration

Energy Drinks

Sports-Related Skin Infections

Lightning

Appearance / Performance Enhancing Drugs

Dietary Supplements

NOTES

All coaches are mandated to complete the PIAA continuing education courses on CONCUSSIONS – CARDIAC EMERGENCIES – HEAT ILLNESS.



POSITION STATEMENT AND RECOMMENDATIONS **FOR MAINTAINING HYDRATION TO OPTIMIZE PERFORMANCE AND** **MINIMIZE THE RISK FOR EXERTIONAL HEAT ILLNESS**

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

DEHYDRATION – ITS EFFECTS ON PERFORMANCE AND ITS RELATIONSHIP TO EXERTIONAL HEAT ILLNESS RISK:

- Appropriate hydration before, during, and after physical activity is integral to healthy, safe and successful sports participation.
- Weight loss during exercise and other physical activity represents primarily a loss of body water. A loss of just 1 to 2% of body weight (1.5 to 3 pounds for a 150-pound athlete) can negatively impact performance. A loss of 3% or more of body weight during vigorous exercise can also significantly increase the risk for exertional heat-related illness. If an athlete is already dehydrated prior to beginning activity, these effects will occur even sooner.
- Athletes should be weighed (in shorts and T-shirt) before and after warm or hot weather practice sessions and contests to assess their estimated change in hydration status.
- Athletes with high body fat percentages can become significantly dehydrated and over-heat faster than athletes with lower body fat percentages, while working out under the same environmental conditions at the same or similar workload.
- Athletes have different sweating rates and some lose much more water and salt through their sweat than others. “Salty sweaters” will often have noticeable salt stains on their clothing and skin after workouts, and they often have a higher risk of developing exertional muscle cramps.
- Poor heat acclimatization/fitness levels can greatly contribute to an athlete’s heat intolerance and exertional heat illness risk.
- Certain medications or current/recent illness, especially for illnesses involving gastrointestinal distress (e.g., vomiting, diarrhea) and/or fever, can negatively affect an athlete’s hydration status and temperature regulation, increasing the risk for exertional heat illness.
- Environmental temperature and humidity each independently contribute to dehydration and exertional heat illness risk.

- Clothing that is dark or bulky, as well as protective equipment (such as helmets, shoulder pads and other padding and coverings), can increase body temperature, sweat loss and subsequent dehydration and exertional heat illness risk.
- Even naturally dry climates can have high humidity on the field if irrigation systems are run prior to early morning practices start. This temporary increase in humidity will continue until the water completely soaks into the ground or evaporates.
- A heat index chart should be followed to help determine if practices/contests should be modified or canceled. The NOAA National Weather Service's heat index chart can be found at: <http://www.weather.gov/om/heat/index.shtml>
 - On-site wet-bulb temperature is the “gold standard” for assessing heat index and should be measured 10-15 minutes before practices or contests. The results should be used with a heat index to determine if practices or contests should be started, modified, or stopped.
 - In more mild climates, if wet-bulb temperature measurement is not available, the heat index for your approximate location can be determined by entering your postal zip code: <http://www.osaa.org/heatindex/>
 - Best practices may be established for your state and region by your state athletic association. We recommend strict adherence to state or regional guidelines.

The interplay of relative humidity and temperature on sweating and the risk for exertional heat illness:

- A combined relative humidity of 40 percent and a temperature of 95 degrees Fahrenheit are associated with a *likely risk* of incurring significant sweat loss and exertional heat illness during strenuous physical activity. However, even with a *lower air temperature* of only 85 degrees Fahrenheit, for example, the risk for extensive sweating and exertional heat illness would likely be the *same or greater with a higher relative humidity* of 70 percent or more.

WHAT TO DRINK DURING EXERCISE AND OTHER PHYSICAL ACTIVITY:

- For most exercising athletes in most scenarios, water is appropriate and sufficient for pre-hydration and rehydration. Water is quickly absorbed, well-tolerated, an excellent thirst quencher and cost-effective.
- Traditional sports drinks with an appropriate carbohydrate and sodium formulation may provide additional benefit in the following general situations:
 - Prolonged continuous or intermittent activity of greater than 60 minutes
 - Multiple, same-day bouts of intense, continuous or repeated exertion
 - Warm-to-hot and humid conditions
- Traditional sports drinks with an appropriate carbohydrate and sodium formulation may provide additional benefit for the following individual conditions:
 - Poor hydration prior to participation
 - A high sweat rate and/or “salty sweater”
 - Poor caloric intake prior to participation
 - Poor acclimatization to heat and humidity

- A 6 to 8% carbohydrate formulation is the maximum that should be utilized in a sports drink. Any greater concentration will slow stomach emptying and potentially cause the athlete to feel bloated. An appropriate sodium concentration (0.4–1.2 grams per liter) will help with fluid retention and distribution and decrease the risk of exertional muscle cramping.

WHAT NOT TO DRINK DURING EXERCISE AND OTHER PHYSICAL ACTIVITY:

- Fruit juices with greater than 8 percent carbohydrate content and carbonated soda can both result in a bloated feeling and abdominal cramping.
- Athletes should be aware that nutritional supplements are not limited to pills and powders as many “energy” drinks contain high levels of sugar, caffeine, and other sources of caffeine such as guarana and green tea extract.
 - The high levels of sugar and caffeine may result in increased anxiety, jitteriness, nausea, and upset stomach or diarrhea.
 - Many of these drinks are being produced by traditional water, soft drink and sports drink companies which can cause confusion in the sports community. As is true with other forms of supplements, these “power drinks”, “energy drinks”, or “fluid supplements” are not regulated by the FDA. Thus, the purity and accuracy of contents on the label is not guaranteed.
 - Many of these beverages which claim to increase power, energy, and endurance, among other claims, may have additional ingredients that are not listed. Such ingredients may be harmful and may be banned by governing bodies like the NCAA, USOC, or individual state athletic associations.
 - See the **NFHS Position Statement and Recommendations for the use of Energy Drinks by Young Athletes** for further information.

HYDRATION AND FLUID INTAKE TIPS AND GUIDELINES:

- Many athletes do not voluntarily drink enough water to prevent significant dehydration during physical activity.
- Drink regularly throughout all physical activities. An athlete cannot always rely on his or her sense of thirst to sufficiently maintain proper hydration. When athletes begin to feel thirsty, they are already in an early state of dehydration.
- Drink before, during, and after practices and games. For example:
 - Drink 16 ounces of fluid 2 hours before physical activity.
 - Drink another 8 to 16 ounces 15 minutes before physical activity.
 - During physical activity, drink 4 to 8 ounces of fluid every 15 to 20 minutes (some athletes who sweat considerably can safely and comfortably tolerate up to 48 ounces per hour).
 - After physical activity, drink 16 to 20 ounces of fluid for every pound lost during physical activity to achieve normal hydration status before the next practice or competition (if there is sufficient time to do this safely and comfortably). Importantly, excessive fluid intake in a short period of time can be dangerous to one’s health (see below on hyponatremia).
- The volume and color of your urine is an excellent way of determining if you’re well hydrated. Small amounts of dark urine mean that you need to drink more, while a “regular” amount of light-colored or nearly clear urine generally means you are well hydrated. A Urine Color Chart can be accessed at: <http://www.urinecolors.com/themes/uctheme/assets/dehydration-chart.pdf>

- Hyponatremia is a rare, but potentially deadly disorder resulting from the over-consumption of water or other low-sodium fluid (including most sports drinks). It is most commonly seen during endurance events, such as marathons, when participants consume large amounts of water or other beverages over several hours, far exceeding fluid lost through sweating. The opposite of dehydration, hyponatremia is a condition where there is an excessive amount of water in the blood and the sodium content of the blood is consequently diluted to dangerous levels. Affected individuals may exhibit disorientation, altered mental status, headache, lethargy and seizures. A confirmed diagnosis can only be made by testing blood sodium levels. Suspected hyponatremia is a medical emergency and the Emergency Medical System must be activated (or Call 9-1-1). Hyponatremia is treated by administering intravenous fluids containing high levels of sodium.

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POSITION STATEMENT AND RECOMMENDATIONS FOR THE USE OF ENERGY DRINKS BY YOUNG ATHLETES

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

Background: Energy drinks are popular among adolescents and young adults and are the second most popular dietary supplement after multivitamins. The distinction between energy drinks and sports drinks is important. Energy drinks are drinks that contain stimulants and claim to “provide energy” while sports drinks contain electrolytes and sugar meant to rehydrate athletes after a workout. Energy drinks are marketed as a quick and easy way to maximize physical performance and mental alertness.

In addition to the regular-sized energy drinks, energy shots are a concentrated form of the same formulation containing caffeine, sugar and other substances. A notable study found that the number of people who visited an Emergency Room with energy drink-related complications doubled between 2007 and 2011, and that 10 percent required hospitalization. Despite efforts to educate consumers, a survey done in 2018 found that 40% of American teens had consumed an energy drink within the previous three months.

Energy drinks can contain up to 500 mg of caffeine, which is five times as much as a typical cup of coffee and 10 times as much as found in a 12-ounce soda. The effects of this can lead to abnormal heart rhythms and even death. After a period of increased alertness, symptoms of caffeine withdrawal predominate. The drinks also contain large quantities of sugar, which causes a spike in blood sugar levels that may be followed by a “sugar crash” with fatigue, shakiness and anxiety. The marketing of these beverages is targeted toward adolescents and young adults. Despite the decrease in the consumption of soft drinks, the sales of energy drinks continue to rise, increasing 47% from 2016 to 2021.

The NFHS SMAC strongly recommends that:

1. Water and appropriate sports drinks should be used for rehydration as outlined in the NFHS “**Position Statement and Recommendations for Maintaining Hydration to Optimize Performance and Minimize the Risk for Exertional Heat Illness.**”
2. Energy drinks SHOULD NOT be used for hydration prior to, during or after physical activity.
3. Information about the absence of benefit and the presence of potential risk associated with energy drinks should be widely shared among all individuals who interact with young athletes.
4. Energy drinks ARE NOT sports drinks and should not be used by athletes in training or competition.
5. Athletes taking over-the-counter or prescription medications are at increased risk for significant, potentially fatal complications, so they should not consume energy drinks without the approval of their physician.

WARNING: Energy drinks are not classified as dietary supplements or beverages. At this time, all of these drinks are completely unregulated. Therefore, the inclusion of different ingredients, their concentrations and their purity is unregulated. There is a significant risk for negative side effects (see below), potentially harmful interactions with prescription medications [particularly stimulant medications used to treat Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD)], or positive drug tests due to contaminants containing banned substances.

Frequently Asked Questions

What is an energy drink?

- An energy drink is a beverage marketed as a quick and easy means of relieving fatigue and improving performance. All energy drinks contain carbohydrates (sugar) and caffeine as their main ingredients. The carbohydrates provide nutrient energy while the caffeine acts as a stimulant to the central nervous system. These drinks may include a variety of other ingredients such as taurine (an amino acid), B vitamins and herbal extracts.

What are the differences between an energy drink and a sports drink?

- Sports drinks are marketed to replenish electrolytes such as calcium, magnesium, sodium and potassium. These electrolytes are typically eliminated from the body during the process of sweating, leaving athletes dehydrated and susceptible to exertional cramping and heat illness. Sports drinks replace these electrolytes along with water, which rehydrates, and sugars, which are added to make the drinks more palatable. Most sports drinks contain a 6 to 8% carbohydrate solution and a mixture of electrolytes. The carbohydrate and electrolyte concentrations are formulated to allow maximal absorption of the fluid by the gastrointestinal tract. Energy drinks often contain a higher concentration of carbohydrates (usually 8 to 11%) and thus, a greater number of calories than sports drinks. They also contain high amounts of caffeine and, in some cases, other nutritional supplements. Additional ingredients with caffeine-like effects may be present, yet typically their caffeine content is not noted. **Energy drinks are not appropriate for hydrating or re-hydrating athletes during physical activity and should not be used in such circumstances.**

What ingredients are found in energy drinks?

- *Sugars/Carbohydrates*- Energy drinks are typically high in sugar. For example, a Monster Energy Drink has 54 grams of sugar, which is equal to 13.5 teaspoons. Other popular brands contain up to 21 teaspoons of sugar. The consequences of such high levels of sugar include weight gain and obesity, type 2 diabetes, dental decay and erosion, aggression and anxiety. The high carbohydrate concentration can also delay gastric emptying and impede absorption of fluid from the gastrointestinal tract.
- *Caffeine*- Nearly all energy drinks contain some quantity of caffeine. The caffeine concentration may range from the equivalent to an 8-ounce cup of coffee (90 mg) to more than three times that amount. The American Academy of Pediatrics (AAP) offers a guideline of no more than 100 mg of caffeine per day in adolescents; however, many of these drinks far surpass that. For example, a 16-ounce can of Monster Energy contains 160 mg of caffeine, while the Rockstar Energy Drink Original contains 160 mg of caffeine per 16-ounce can, and the Rockstar Punched energy drink contains 240 mg of caffeine per 16-ounce can.

- *Herbs*- Many energy drinks include herbal forms of stimulants such as guarana, yohimbe, bitter orange, kola nuts, green tea extract and Yerba mate leaves, in addition to synthetic caffeine. The “performance-enhancing” effects, safety and health benefits of herbs have not been established by scientific studies and these claims are unfounded.
- *Vitamins*- The top five most common ingredients in energy drinks includes the B vitamins, which play a role in converting sugars, fats and protein into energy. Athletes with balanced diets should be assured that they are at low risk for vitamin deficiency and typically do not need supplementation. Furthermore, there is no evidence to suggest that vitamin supplementation improves athletic performance. However, drinks can contain up to 8,000% of the recommended daily value of the B vitamins and unfortunately, most of it is excreted in the urine.
- *Proteins and amino acids*- Proteins and amino acids (the building blocks of protein), such as taurine, were added to the energy drinks as a way to boost sales. Carbohydrates are utilized as the primary fuel source and only a small amount of protein is used as fuel for exercise. To date, there is no definitive evidence that amino acid or protein supplementation enhances athletic performance, especially in young, healthy athletes.
- *Other ingredients*- With the hundreds of energy drink brands that are available, the potential ingredients which they may contain are virtually unlimited. Possible additions include pyruvate, creatine, carnitine, medium-chain triglycerides and even oxygen.
- An emerging practice among young people is to mix energy drinks with alcoholic beverages. This is specifically concerning for the potential abuse of alcohol and the resultant higher amounts of alcohol consumption. The stimulant effect of the caffeine in energy drinks masks the depressant effects of alcohol offering a false sense of security, keeping drinkers awake so they can consume even more alcohol, and they end up more impaired than they realize. This leads to elevated rates of binge drinking, impaired driving, risky sexual behavior, and an increased risk of alcohol dependence. In the short term, consumption of the combination places people at risk for alcohol poisoning, and drinkers may experience abnormal heart rhythms, hallucinations, seizures and death.

What are the possible negative effects of using energy drinks?

- *Central nervous system*- Caffeine often has the effect of making a person feel “energized.” Studies have shown some performance-enhancing benefits from caffeine at doses of 6 mg/kg of body weight. However, these and higher doses of caffeine may produce light headedness, tremors, impaired sleep, suppression of appetite, and difficulty with fine motor control. These effects become more pronounced at higher doses.
- *Gastrointestinal system*- The high concentrations of carbohydrates often found in energy drinks may delay gastric emptying, resulting in a feeling of being bloated. Abdominal cramping may also occur. Both carbohydrates and caffeine in the high concentrations found in most energy drinks may cause diarrhea.
- *Dehydration*- Energy drinks should not be used for prehydration or rehydration. The high carbohydrate concentration can delay gastric emptying and slow absorption from the gastrointestinal tract, and may cause diarrhea. Caffeine can act as a diuretic and, therefore, may result in increased fluid loss.
- *Positive drug tests*- Like all nutritional supplements, there is little or no regulatory oversight of energy drinks. The purity of the products cannot be ensured, and it is possible that they may contain substances banned by some sports organizations. Furthermore, the structure of some of the ingredients found in energy drinks are similar to banned drugs and can lead to a positive drug test result. Energy drinks can cause positive results for THC (the active ingredient in marijuana), barbiturates and cocaine.

- Consumption of energy drinks by adolescents and young adults has been linked to heart arrhythmia (irregular and/or rapid heart rate), other cardiovascular events such as high blood pressure and heart attacks, and liver problems.
- Sales of certain energy drinks have been banned in Denmark, Turkey, Uruguay, Germany and Austria. Some states in the United States have introduced legislation to restrict sales of energy drinks to adolescents and children. Recently, health-care providers have voiced increasing concerns about the consumption of energy drinks in association with alcohol because of the interaction of the stimulant effects of energy drinks and the depressant effects of alcohol. The American Academy of Pediatrics (AAP) has published a position statement condemning the use of energy drinks by youths.

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Sports-Related Skin Infections **Position Statement and Guidelines**

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

Skin-related infections in both the community setting and the sports environment have increased considerably over the past several years. While the majority of these infections are transmitted through skin-to-skin contact, a significant number are due to shared equipment, towels or poor hygiene in general. The NFHS Sports Medicine Advisory Committee (SMAC) has put forth general guidelines for the prevention of the spread of these infectious diseases (See NFHS General Guidelines for Sports Hygiene, Skin Infections and Communicable Diseases).

The NFHS SMAC recognizes that even with strict adherence to these guidelines, given the nature of certain sports, skin infections will continue to occur. For example, the risk of transmission is much higher in sports with a great deal of direct skin-to-skin contact such as wrestling and football. Therefore, the NFHS SMAC has developed specific guidelines for the skin infections most commonly encountered in sports. The guidelines set forth follow the principles of Universal Precautions and err in favor of protecting participants in situations where skin-to-skin contact may occur. Consideration may be given to the particular sport regarding risk of transmission, but these guidelines must be strictly adhered to in sports where skin-to-skin contact is frequent and unavoidable.

Ringworm, Tinea Corporis

These fungal lesions are due to dermatophytes. As they are easily transmissible, the student should be treated with an oral or topical antifungal medication for a minimum of 72 hours prior to participation. Once the lesion is considered to be no longer contagious, it may be covered with a bio-occlusive dressing. For scalp involvement, the infection is more difficult to treat and requires 14 days of oral antifungal medication before return to practice and competition. With scalp involvement, shedding of fungal spores can persist well beyond 2 weeks. Consider washing scalp before practice with ketoconazole 1% shampoo to reduce transmission of spores. Continue with treatment until scalp lesions are gone.

Impetigo, Folliculitis, Carbuncle and Furuncle

While these infections may be secondary to a variety of bacteria, methicillin-resistant *Staphylococcus aureus* (MRSA) infections are of greatest concern. The athlete should be treated and removed from practice and competition. Treatment may consist of incision and drainage with or without oral antibiotics. For non-MRSA infections, return to contact practices and competition may occur after 72 hours of treatment, provided the infection is not actively draining. At this time the involved site may be covered with a bio-occlusive dressing. If there is spontaneous drainage or incision and drainage, then may return to practice and competition after 72 hours of treatment. If MRSA is present, abscess incision and drainage is recommended for return to practice

and competition may be considered after 72 hours of treatment, provided there is no further drainage or new abscess formation. All lesions should be considered infectious until each one has a well-adherent scab without any drainage or weeping fluids. Once a lesion is no longer considered infectious, it should be covered with a bio-occlusive dressing until complete resolution.

During the time when a student has been identified with any of these infections, increased screening should occur. At this time, all team members should be carefully screened for similar infections on a daily basis by a knowledgeable coach or appropriate health-care professional. If multiple students are infected, consideration should be given to contacting the local or state health department for further guidance.

Shingles, Cold Sores

These are viral infections, which are transmitted by skin-to-skin contact. Lesions on exposed areas of skin that are not covered by clothing, uniform or equipment require the player to be withdrawn from any activity that may result in direct skin-to-skin contact with another participant. Covering infectious lesions with an occlusive dressing is not adequate, sufficient, or acceptable. Prior to returning to participation, primary outbreaks of shingles and cold sores require 10-14 days of oral antiviral medications, while recurrent outbreaks require 120 hours of treatment as a minimum treatment time. For a student to be considered "non-contagious," all lesions must be scabbed over with no oozing or discharge, and no new lesions should have occurred in the preceding 72 hours.

Herpes Gladiatorum

This skin infection, primarily seen among wrestlers, is caused by herpes simplex virus Type 1 (HSV-1). The spreading of this virus is strictly skin-to-skin. The majority of the outbreaks develop on the head, face and neck, reflecting the typical wrestling lock-up position. The initial outbreak is characterized by a raised rash with groupings of 6-10 vesicles (blisters). For head, face and neck involvement, symptoms include sore throat, fever, malaise and swollen cervical lymph nodes. For a primary infection (first episode of Herpes Gladiatorum), wrestlers should be treated and not allowed to practice or compete for a minimum of 10 days. If general body signs and symptoms like fever and swollen lymph nodes are present, that minimum period of treatment should be extended to 14 days. If antivirals are not used, the infected participant may return to full contact wrestling only after all lesions are well-healed with well-adhered scabs, there has been no new vesicle formation in the preceding 72 hours, and there are no swollen lymph nodes near the affected area. The infected individual must be immediately removed from contact (practices and contests) and seek appropriate care and treatment. Return to contact is permissible only after all lesions are healed with well-adherent scabs, no new vesicles have formed, and no swollen lymph nodes remain near the affected area. Oral antiviral medications should be started and can expedite the clearing of an outbreak. Careful consideration should be given to prophylactic oral antivirals for the remainder of the season and each subsequent season.

Recurrent outbreaks usually involve a smaller area of skin, milder systemic illness and a shorter duration of symptoms. Treatment should include oral antivirals. If antiviral therapy is initiated, the participant must be held from contact sports for a minimum of 120 hours. Even greater consideration should be given to prophylactic antivirals for the remainder of the season. As the herpes virus may spread prior to vesicle formation, anyone in contact with the infected individual during the three days prior to the outbreak **must** be isolated from any contact activity for eight days and be examined daily by a knowledgeable coach or appropriate health-care professional for suspicious skin lesions.

Miscellaneous Viral Infections

Verrucae (warts) are skin infections that are also caused by viruses but are not considered highly contagious. Therefore, these lesions require no treatment or restrictions, but should be covered if prone to bleeding when abraded. Molluscum contagiosum is considered contagious and transmits via direct skin-to-skin contact. Treatment consists of expressing the material from each vesicle and lightly treating with a hyfrecator, usually performed by an appropriate health-care professional. Participation can ensue immediately after treatment, provided sites are covered with a bio-occlusive dressing.

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GUIDELINES ON HANDLING PRACTICES AND CONTESTS DURING LIGHTNING OR THUNDER DISTURBANCES

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

These guidelines provide a default policy to those responsible or sharing duties for making decisions concerning the suspension and restarting of practices and contests based on the presence of lightning or thunder. The preferred sources from which to request such a policy for your facility would include your state high school activities association and the nearest office of the National Weather Service.

PROACTIVE PLANNING

1. Assign staff to monitor local weather conditions before and during practices and contests.
 2. Develop an evacuation plan, including identification of appropriate nearby safer areas and determine the amount of time needed to get everyone to a designated safer area:
 - a. A designated safer place is a substantial building with plumbing and wiring where people live or work, such as a school, gymnasium or library. An alternate safer place from the threat of lightning is a fully enclosed (not convertible or soft top) metal car or school bus.
 3. Develop criteria for suspension and resumption of play:
 - a. When thunder is heard or lightning is seen*, the leading edge of the thunderstorm is close enough to strike your location with lightning. Suspend play for at least 30 minutes and vacate the outdoor activity to the previously designated safer location immediately.
 - b. 30-minute rule. Once play has been suspended, wait at least 30 minutes after the last thunder is heard or lightning is witnessed* prior to resuming play.
 - c. Any subsequent thunder or lightning* after the beginning of the 30-minute count will reset the clock and another 30-minute count should begin.
 - d. When independently validated lightning-detection devices or mobile phone apps are available, this technology could be used to assist in making a decision to suspend play if a lightning strike is noted to be within 10 miles of the event location. However, you should never depend on the reliability of these devices and, thus, hearing thunder or seeing lightning* should always take precedence over information from a mobile app or lightning-detection device.
- * – At night, under certain atmospheric conditions, lightning flashes may be seen from distant storms. In these cases, it may be safe to continue an event. If no thunder can be heard and the flashes are low on the horizon, the storm may not pose a threat. Independently verified lightning detection information would help eliminate any uncertainty.
4. Review the lightning safety policy annually with all administrators, coaches and game personnel and train all personnel.
 5. Inform student-athletes and their parents of the lightning policy at start of the season.

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POSITION STATEMENT ON APPEARANCE AND PERFORMANCE ENHANCING DRUGS AND SUBSTANCES

**National Federation of State High School Associations (NFHS)
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BACKGROUND

Appearance and performance enhancing drugs and substances, or APEDS, refer to products that can be either naturally or synthetically produced and used with the intention of enhancing appearance or improving athletic performance. This use of APEDS is often referred to as “doping,” and has unfortunately been a part of competitive sport since ancient Roman times. In 1999, the World Anti-Doping Agency (WADA) was formed, with the mission of creating a doping-free sporting environment. In the United States, the U.S. Anti-Doping Agency (USADA) is the national anti-doping organization. WADA publishes the World Anti-Doping Code, which is followed by most sporting organizations, including the International Olympic Committee.

WHAT ARE APEDS?

The spectrum of APEDS is very broad, encompassing many different substances and methods of improving physical performance. There are multiple substances and drugs that fall under the heading of APEDS, from caffeine, found in numerous beverages, to illegal and dangerous anabolic steroids. All APEDS have the potential for dangerous complications and side effects, if used improperly. However, to more reasonably discuss use and abuse, we can divide them into two broad categories:

1. Legal, not banned for competition, and may have some positive effects upon athletic performance:

- a. Caffeine (limit set by WADA and NCAA)
- b. Creatine
- c. Protein powders and amino acids

An interesting distinction concerning APEDS is that except for prescription medications, none of the other products are regulated or routinely tested by the U.S. Food and Drug Administration (FDA). A dangerous side of this lack of regulation is the potential for the presence of contaminants in dietary supplements. Some studies have shown that 8-20% of tested protein supplements are contaminated with significant amounts of heavy metals, such as lead and mercury. In addition, 25% were found to be contaminated with anabolic androgenic steroids, and 11% were found to be contaminated with stimulants. Such “contamination” may be no accident as the manufacturer obviously benefits from a product that is effective, despite significant safety concerns for the consumer.

Caffeine has been shown to improve performance in endurance events. Its use is restricted, but not banned, by the NCAA and WADA. Caffeine can also have multiple side effects, some potentially dangerous, including headaches, increased blood pressure and increased heart rate. In 2011, almost 1,500 12- to 17-year-old

children went to the emergency department due to caffeine toxicity. Caffeine is treated differently than other supplements by the FDA. While the FDA regulates the amount of caffeine allowed in foods and soft drinks, it does not regulate the amount allowed in energy drinks and supplements. This explains why the ingestion of multiple energy drinks can lead to dangerous levels of caffeine.

Creatine is a naturally occurring substance stored in fast-twitch muscle fibers, and serves as an energy source for muscle contraction. It works to increase strength, peak force and peak power when performing multiple sets of maximal-effort muscle contractions. Therefore, it is likely more effective for off-season weight training than for any specific sport or event. Creatine use is relatively safe, but there are risks of dehydration, muscle cramps and blood clots associated with its use.

Amino acids and protein powders are very popular and marketed as “muscle building” products. While there may be some benefits to the use of these products, amino acids and proteins are present in a variety of meats and other foods for much less cost.

2. Legal only when prescribed by a physician, illegal to possess without prescription, can have a positive effect upon athletic performance, banned for competition by NCAA, USADA and WADA.

- a. Anabolic Androgenic Steroids (AAS)
- b. AAS prohormones
- c. Human Growth Hormone (hGH)
- d. Stimulants (examples: Ritalin, Adderal)

The most commonly known category of APEDS is anabolic-androgenic steroids (AAS). The anabolic effect is what causes an increase in muscle tissue, whereas the androgenic effect leads to masculinization, the secondary sex characteristics that males experience during puberty. These steroids are very different from corticosteroids, which are used to treat inflammation in a joint, such as with a cortisone injection, or to treat illnesses like asthma. A prohormone is a precursor to the active hormone, and becomes converted to its active form once taken into the body. Prohormones are also included in the anabolic-androgenic category. AAS and AAS prohormones work by enhancing protein synthesis and decreasing the breakdown of muscle. The net result is an increase in muscle size, muscle strength and lean muscle mass along with a decrease in body fat.

Muscle-building steroids do work, but their use comes at a high cost. First, it is illegal to possess and use these drugs without a prescription. From a side effect standpoint, AAS use during adolescence can cause premature closure of the bones’ growth plates, leading to decreased final adult height. Acne, male pattern baldness, hypogonadism (shrinking of the testicles), gynecomastia (male breast overdevelopment) and violent behavior changes are all common side effects. There are also life-threatening side effects including cardiovascular disease, arrhythmias, blood clots, stroke, cancer and increased risk of suicide.

For more than a decade, the use of human growth hormone (hGH) by professional athletes has been in the spotlight. hGH promotes growth throughout childhood and adolescence, and is also involved in the regulation of multiple other hormones, such as insulin. Studies have shown that the use of hGH can decrease fat mass and increase lean body mass. However, there is limited evidence that its use improves athletic performance. Because it is normally a very important hormone in the regulation of other hormones and multiple body processes, the use of hGH can lead to multiple side effects, including altered fluid balance in the body, cardiovascular disease, diabetes and cancer.

Stimulants are a category of APEDS that have been used for centuries as a performance enhancer. We have already discussed caffeine, the most commonly used stimulant. Stimulants may enhance performance by improving reaction time and increasing alertness, decreasing fatigue, and improving concentration and memory. Side effects from the use of stimulants range from relatively mild effects to the dangerous, including inability to sleep, anxiety, tremors, panic attacks, tachycardia (a rapid heart rate > 100), hypertension, psychosis, heart attacks and stroke. Some stimulants can also predispose an athlete to heat illness and death. Ephedrine was banned by the FDA in 2004 for use as a diet aid because of the increased risk of stroke and heart attack.

WHO IS USING APEDS?

The use of APEDS in high school students ranges from 3% admitting the use of AAS, to almost 40% reporting a history of protein supplement use. Eighteen percent of APEDS users in high school do not participate in sports, so it is considered that this group uses APEDS for appearance enhancement (weight loss or gain, body building). Girls report a higher use of nonprescription diet pills (considered stimulants) than boys, and a lower use of substances associated with gains in muscle mass and strength, such as AAS, prohormones, and creatine.

WHY IS THE USE OF APEDS AN ISSUE?

The use of illegal or banned APEDS by high school students is unfair, unethical and is considered a form of cheating. In addition, many of the products used as APEDS are not tested or regulated, and have been found to contain significant contamination with heavy metals, AAS and/or stimulants. Their use undermines the values of fair play, and can be a threat to the overall health and well-being of high school students.

The use of caffeine, creatine and amino acids/protein powders should not be taken lightly, but these substances are not dangerous if the athlete has first discussed their proper use with a knowledgeable health-care provider and they are used as directed. As discussed earlier, the true purity of the product and potential for contamination must also be a consideration when deciding to use this category of APEDS.

PREVENTING STUDENTS FROM USING ILLEGAL OR BANNED APEDS

Education about APEDS and their use is the hallmark to any prevention program. Despite advances in APEDS detection, random testing does not appear to be an effective deterrent to the use of APEDS. The following are key educational points to prevent the use of APEDS:

- School personnel, coaches, parents and other family members can reduce APEDS abuse by educating students and speaking out against such use.
- Talk with your students about their concerns and frustrations related to how they look or how they are performing in their sport. Help them establish and reinforce healthy and realistic expectations of their bodies and athletic performance.
- Have your athletes focus on proper nutrition and hydration. If possible, have your athletes work with a registered dietician to develop a plan for appropriate weight gain and/or weight loss.
- Help your athletes understand that using illegal and banned APEDS is unfair, unethical and likely dangerous.
- Emphasize to your students that they should not trust internet marketing messages about quick fixes and enticing gains in athletic appearance or performance. Explain that the photos in these sites and in muscle magazines depict unrealistic pictures of male and female bodies.
- Discourage your athletes' access to environments where APEDS use might occur and to people who are involved with APEDS.

- Consider initiating a formal APEDS education program to educate your students and athletes and to deter APEDS use, such as the ATLAS and ATHENA programs.

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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.



DIETARY SUPPLEMENTS POSITION STATEMENT

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

EXISTING POLICIES/STANDS:

The NFHS Sports Medicine Advisory Committee (SMAC) strongly opposes the use of dietary supplements for the purpose of obtaining a competitive advantage. Research shows that there continues to be widespread use of dietary supplements by adolescent and high school athletes, despite considerable safety concerns. Dietary supplements are marketed as an easy way to enhance appearance and athletic performance, increase energy levels, lose weight, and feel better. Adolescents are more susceptible to peer pressure and these advertising messages, which may increase the incidence of dietary supplement usage and reinforce a culture more concerned about short-term performance rather than overall long-term athletic development and good health.

BACKGROUND:

The Dietary Supplement Health and Education Act (DSHEA) of 1994 removed dietary supplements from pre-market regulation by the Food and Drug Administration (FDA). Under DSHEA, a manufacturing firm is responsible for determining that the dietary supplements it manufactures or distributes are safe and that any representations or claims made about them are substantiated by adequate evidence to show that they are not false or misleading. This essentially classifies dietary supplements as a food, not a drug, and as such, they are not subject to the same strict tests and regulations as prescription and “over-the-counter” medications by the FDA. Only the companies that produce dietary supplements are responsible for ensuring that their products are pure, safe and effective for their intended use. As the FDA has limited resources to analyze the composition of dietary supplements, there is often no guarantee concerning the true amount, concentration or purity of the ingredients as listed on the label. In fact, the FDA cannot remove a dietary supplement from the marketplace unless the supplement has been shown to be “unsafe.”

The NFHS SMAC strongly opposes the use of supplements by high school athletes for performance enhancement, due to the lack of published, reproducible scientific research documenting the benefits of their use and confirming that there are no potential long-term adverse health effects with their use, particularly in the adolescent age group. Dietary supplements should be used only upon the advice of one’s health care provider for health-related reasons – not for the purpose of gaining a possible competitive advantage. School personnel and coaches should never recommend, endorse or encourage the use of any dietary supplement, drug, or medication for performance enhancement.

We recommend that coaches, athletic directors, and other school personnel develop strategies that address the prevalence and growing concerns of using dietary supplements. Such strategies may include conversations with athletes and their parents about the potential dangers of dietary supplement use. Athletes should be encouraged to pursue their athletic goals through hard work, appropriate rest and good nutrition, not unsubstantiated dietary shortcuts.

In order to discourage dietary supplement use for athletic performance:

- School personnel, coaches, and parents should allow for open discussion about dietary supplement use, and strongly encourage obtaining optimal nutrition through a well-balanced diet.
- Remind athletes that no supplement is harmless or free from consequences and that there are no short cuts to improve athletic performance.
- Because they are not strictly regulated, dietary supplements may contain impurities, additives that may produce allergic response (in those with allergies) and banned substances not listed on the label.
- Remind athletes that energy drinks are not appropriate for hydration or as dietary supplements.

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