Sports Medicine Handbook

The NCAA Sports Medicine Handbook is intended to provide the membership with considerations for the development and review of policies and procedures for the administration of athletics health care, background and contextual information on existing guidance and direction to available resources.

The Sports Medicine Handbook is not intended to provide guidance about the clinical and/or medical care of individual student-athletes; it is expected that primary athletics health care providers will provide evidence- and consensus-based health care that is consistent with the standards of care for ongoing licensure in their profession.

Approaches to supporting student-athlete mental and physical health, safety and performance will vary by school due to differences in student-athlete needs, as well as differences in local and state resources. However, such policies should reflect a commitment to protecting student-athletes' mental and physical health, safety and performance, as well as an awareness of the considerations set forth in this handbook.

The Sports Medicine Handbook is updated periodically and provides information on a select number of medical topics by relying on publicly available sources, which are cited as reference materials. Science and medicine will continue to evolve between editions of the Sports Medicine Handbook, as new scientific and medical literature is published each year. The Sports Medicine Handbook is not intended to be a complete or comprehensive summary of each topic. Primary athletics health care providers have the responsibility for providing health care to their student-athletes, which includes following any developments in science and medicine, notwithstanding the contents of this document.

Twenty-sixth Edition

Note: Revisions to the NCAA Sports Medicine Handbook may be made on a regular basis.

The NCAA Sports Medicine Handbook, twenty-sixth edition, provides considerations to member schools as they meet their constitutional obligation to protect, support and enhance the physical and mental health, safety and performance of student-athletes.

Contributors to the material included in the Sports Medicine Handbook include past and present members of the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, Sports Science Institute staff, representatives from Datalys Center for Sports Injury Research and Prevention and others.

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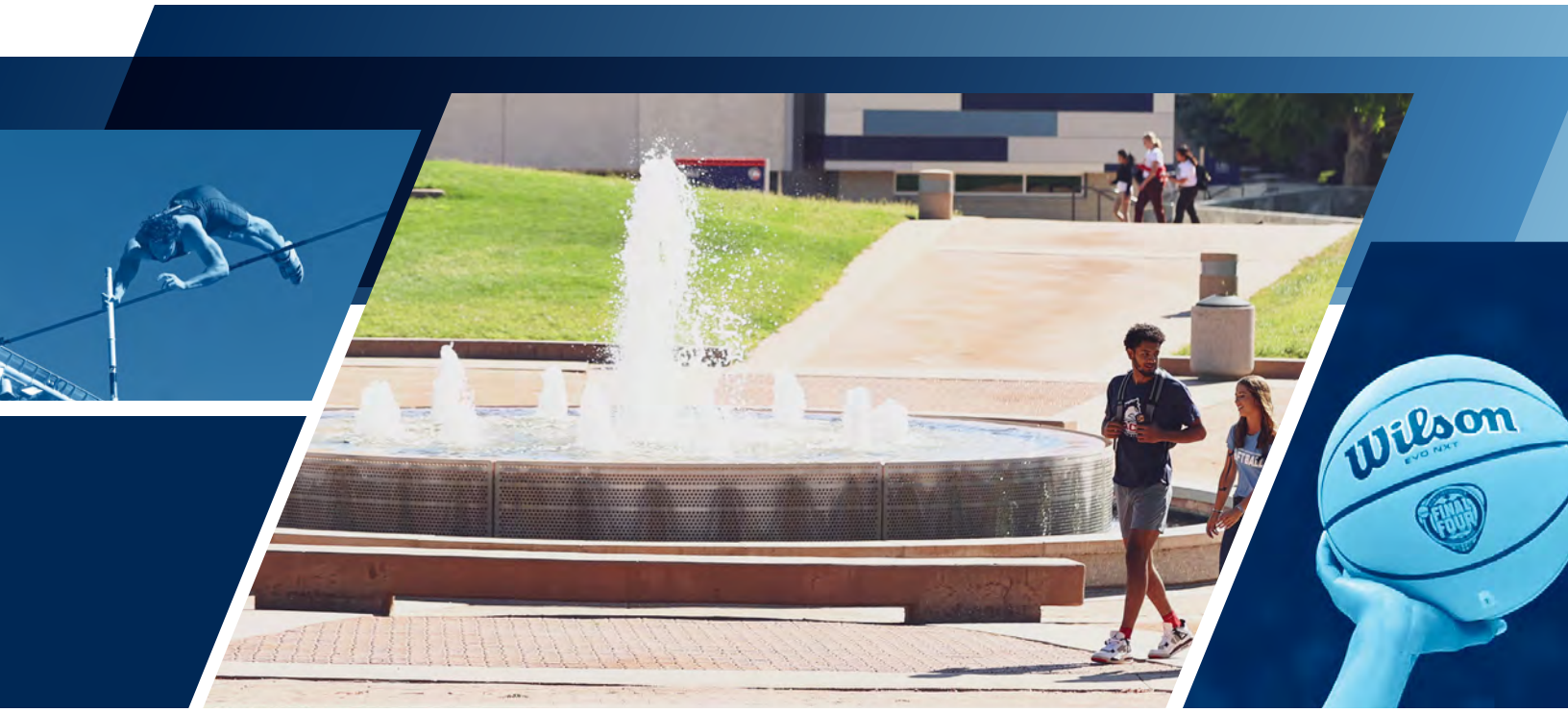

Guideline 1A

Sports Medicine Administration

The following are important components of a school's efforts to support student-athlete mental and physical health, safety and performance. These serve both as a checklist and guidance for schools to use to meet their constitutional obligation with respect to the health and welfare of student-athletes.

Legislative Requirements

Schools are responsible for ensuring compliance with NCAA legislation relevant to mental and physical health, safety and performance as outlined in the division manuals.

The following is not intended to be a comprehensive list. Instead, it is recommended that sports medicine staff work closely with their athletics compliance administrators to closely review and consider all mental and physical health-, safety- and performance-related legislation. Because legislation is updated regularly, specific legislative citations are not provided.

1. **Athletics Health Care Administrator** (See DI and DIII Bylaw 20 and DII Bylaw 7). Independent medical care legislation requires institutions to designate an athletics health care administrator to oversee the school's athletics health care administration and delivery. This person serves in an administrative capacity that complements the athletics health care team. (See **Athletics Health Care Administrator** and **Guideline 1C: The Athletics Health Care Administrator**.)
2. **Certification of Insurance Coverage** (See DI and DIII Bylaw 20 and DII Bylaw 7). A school must certify insurance coverage for medical expenses resulting from athletically related injuries in a covered event. Such insurance coverage must be of equal or greater value than the deductible of the **NCAA Catastrophic Injury Insurance Program** and may be provided through individual, parental/guardian or institutional insurance coverage.
3. **Concussion Management Plan** (See DI and DIII Bylaw 20 and DII Bylaw 7). Schools must have a concussion management plan for their student-athletes. The plan shall be consistent with the NCAA Concussion Safety Protocol Checklist and meet other legislative requirements. (See **Guideline 5A: Concussion** and **NCAA Concussion Resources**, which include the Concussion Safety Protocol Checklist).
4. **Designation of Team Physician** (See DI and DIII Bylaw 20 and DII Bylaw 7). A team physician (Doctor of Medicine or Doctor of Osteopathic Medicine)

must be designated for all or each of an institution's intercollegiate teams and be authorized to oversee the medical services for injuries and illnesses incidental to a student-athlete's participation.

5. **Health Insurance Portability and Accountability Act (HIPAA) Authorization/Buckley Amendment Consent Form** (See DI Bylaws 12 and 20, DII Bylaws 7 and 14 and DIII Bylaws 14 and 20). A school shall administer annually a statement for each student-athlete to voluntarily sign that authorizes/consents to the school's physicians, athletics directors and health care personnel to disclose the student-athlete's injury/illness and participation in athletics to the NCAA and to its Injury Surveillance Program, agents and employees for the purpose of conducting research into the reduction of athletics injuries. The authorization/consent by the student-athlete is voluntary and is not required for the student-athlete to be eligible to participate.
   - **Medical Documentation and Release of Protected Health Information.** Medical documentation of patient encounters is required of health care providers. These practices must align with HIPAA, FERPA and state law. Athletic trainers should discuss with administrators, legal counsel and their supervising physician how each of these laws affects the level of documentation and to whom and how they can release protected health information to relevant stakeholders. Established and agreed-upon written policy and procedures regarding how an athletic trainer is expected to manage information protected under HIPAA and FERPA should be developed at the institutional level in collaboration with institutional privacy officers. (See **Guideline 1K: Health Records Administration**.)
6. **Independent Medical Care** (See Constitution 2.4, DI and DIII Bylaw 20 and DII Bylaw 7). Institutional line of medical authority should be established in the sole interest of student-athlete health and safety. An institution should establish an administrative structure that provides independent medical care and affirms the unchallengeable autonomous authority of primary athletics health care providers (team physicians and athletic trainers) to determine medical management and return-to-play decisions related to student-athletes. (See **Guideline 1B: Independent Medical Care for College Student-Athletes**.)
7. **Mandatory Medical Examination** (See DI Bylaws 13 and 17 and DII and DIII Bylaw 17). All student-athletes beginning their initial season of eligibility, transfer student-athletes and student-athletes who are trying out for a team must undergo a mandatory medical examination, also known as a preparticipation physical, before they are permitted to engage in any practice, competition or out-of-season conditioning. (See **Guideline 1E: Preparticipation Physical Evaluations**.)
   - **Sickle Cell Solubility Test** (See DI and DII Bylaws 13 and 17 and DIII Bylaw 17). As part of the mandatory medical examination, all student-athletes new to sport participation at their school (including prospective student-athletes participating in tryouts) must complete a sickle cell solubility test or show results of a previous solubility test prior to clearance for practice, competition or out-of-season conditioning. (See **Guideline 4D: Sickle Cell Trait** and **NCAA resources on sickle cell trait**.)
8. **Medical Expenses** (See Bylaw 16). A school, conference or the NCAA may provide medical and related expenses and services to a student-athlete.
   - **Division I Only - Medical Coverage** (See Division I Bylaw 16). In Division I, a school shall provide medical care to a student-athlete for an athletically related injury incurred during the student-athlete's involvement in athletics for the institution. The period of care for such an injury shall extend at least two years following either graduation or separation from the school, or until the student-athlete qualifies for coverage under the **NCAA Catastrophic Injury Insurance Program**, whichever occurs first.
9. **Mental Health Services and Resources** (See Bylaw 16). A school shall make mental health services and resources available to its student-athletes. Such services and resources may be provided or arranged by athletics and/or the school's health services department. Provision of services and resources must be consistent with **NCAA Mental Health Best Practices**. (See **Guideline 6A: Mental Health Best Practices**.)

10. **NCAA Drug-Testing Program** (See Bylaw 18, DI Bylaw 20 and DII and DIII Bylaw 31). Schools shall ensure compliance with the NCAA drug testing program. The purpose of the drug-testing program is to deter student-athletes from using performance-enhancing drugs. The drug-testing program also impacts the eligibility of student-athletes who test positive for banned substances. The NCAA tests for steroids, peptide hormones and masking agents year-round and also tests for stimulants and recreational drugs during championships. Member schools also may test for these substances as part of their athletics department drug-deterrence programs. (See **NCAA resources on drug testing**.)
    - NCAA legislation requires that all active member institutions educate athletics staff (e.g., administrators, coaches) and student-athletes about banned drug classes and banned substances including the risks of nutritional supplement use. A **drug education framework** is provided for member schools to use when conducting drug education for their student-athletes and athletics staff.
    - Drug-Testing Consent Form (see DI Bylaw 20). Schools must obtain consent for drug testing from each student-athlete on an annual basis.

Consensus-Based Guidance

As noted in the NCAA Constitution and when requested by a Board of Governors recognized committee, NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, or a division, the Association shall identify and promulgate guidance, rules and policies based on consensus of the medical, scientific, sports medicine and sport governing communities.

Following the **process approved by the NCAA Board of Governors**, the NCAA collaborates with multidisciplinary teams, content experts, leading medical and sports medicine organizations and NCAA member schools to develop consensus-based best guidance and considerations. Some of these have been formalized as Association-wide policy or legislation. Additionally, Division I schools must attest annually to being in compliance with the following consensus-based guidance:

- **Mental Health Best Practices: Understanding and Supporting Student-Athlete Mental Health**.
- **Concussion Safety Protocol Checklist**.
- **Preventing Catastrophic Injury and Death in Collegiate Athletes**.
- **Cardiac Care Best Practices Checklist**.
- **Independent Medical Care for College Student-Athletes Best Practices**.

Consensus-based guidance documents are housed on the NCAA website and introduced in separate guidelines in this handbook.

NCAA Committee on Competitive Safeguards and Medical Aspects of Sports

The **NCAA Committee on Competitive Safeguards and Medical Aspects of Sports** provides expertise to the Association in order to promote a healthy and safe environment for student-athletes through research, education, collaboration and policy development. The Association-wide committee is made up of 25 members, including athletics administrators, coaches, sports medicine staff, researchers, faculty and student-athletes. They have provided **statements for consideration** on a variety of topics, including (but not limited to):

- **Air Quality**.
- **Athletic Training Workforce Issues**.
- **Inclement Weather**.
- **Medical Care and Coverage for Student-Athletes at Away Events**.
- **Performance Technology**.

Required Reporting and Injury Surveillance

NCAA legislation and policy requires schools to report on a number of health, safety and performance topics.

1. **Catastrophic Sport Injury Report.** Legislation adopted in 2014 in all three divisions requires member schools **to report annually** on all student-athlete fatalities, near fatalities and catastrophic injuries (e.g., injuries and illnesses related to head, neck, spine, heart, lung, heat, sickle cell trait, eyes), regardless of whether such fatality/injury is sport-related. Identifying the causes and circumstances of catastrophic events is critical to developing effective prevention and response strategies.
2. **Concussion Reporting.** Section IX.C. of the **Arrington Settlement Agreement** obligates the NCAA to "create a reporting process through which member schools will report instances of diagnosed concussions in NCAA student-athletes and their resolution." All three NCAA divisions passed legislation requiring an active member school "to report all instances of diagnosed sport-related concussions in student-athletes and their resolution to the NCAA on an annual basis pursuant to policies and procedures maintained by the Committee on Competitive Safeguards and Medical Aspects of Sports." A website and online reporting process is available to the membership and the URL for that website can be found in **step-by-step reporting instructions for member schools**. (See **Guideline 5A: Concussion**.)

   The annual cycle for reporting concussions is from July 1 to June 30 of the following year. Schools may report at any time during the year, but it is anticipated that most schools will elect to report late in the cycle to ensure that they have an accurate accounting of the concussions that occurred during the preceding academic year.
3. **Institutional Performance Program Health and Safety Survey (DI and DII requirement, voluntary for DIII).** The annual Institutional Performance Program Health and Safety Survey is distributed to the athletics health care administrator at every NCAA Division I and II member school. Division I and II legislation requires schools to complete this survey, which is overseen by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports. Data from the survey is housed in the NCAA Institutional Performance Program for the purpose of providing member schools with information that can facilitate institutional assessment of various aspects of health care delivery and administration. (See **Guideline 8A: Institutional Performance Program**.)
4. **Injury Surveillance Program (voluntary for all divisions).** Developed in 1982 as a national injury data collection tool for college athletics, the **NCAA Injury Surveillance Program** is a voluntary program through which athletic trainers at member schools can securely submit medical data that is subsequently validated and analyzed for the purpose of tracking and analyzing illnesses and injuries that result from NCAA sport participation. Participating athletic trainers are eligible to receive continuing education units from the Board of Certification. (See **Guideline 8B: Injury Surveillance in Health and Safety**.)

General Considerations

1. **Collaboration with Public Health Authorities.** Medical staff collaboration and planning with public health authorities on the institutional, local, state and national levels is essential in cases of emergent health-related circumstances that potentially may impact health and safety of student athletes and staff. (See **Guideline 1F: Prevention and Management of Infectious Disease Outbreaks**.)
2. **Emergency Care.** NCAA member institutions should have on file and annually update an emergency action plan for each athletics venue, including the location of all emergency equipment and AED devices. These plans should include management of medical emergencies such as cardiac events, heat illness, sickling, shock, airway loss and head/spine injuries. These plans should be disseminated to staff supporting facilities and events, coaches and other support staff, and visitors using these venues. Rehearsal of the emergency

General Considerations cont'd

action plan should occur at minimum annually with personnel who may be involved in management of an emergency. A mental health emergency action plan should be developed, shared and rehearsed with all those who may be involved in managing a situation involving a student-athlete experiencing a mental health emergency. (See **Guidelines 1K: Emergency Action Plans** and **6A: Mental Health Best Practices**.)

- **Catastrophic Incident Plan.** NCAA member institutions should develop a catastrophic incident guideline to provide a response plan and support that is necessary during and after a catastrophe, such as death or permanent disability during an intercollegiate athletics-sponsored activity. (See **Guidelines 1K: Emergency Action Plans** and **4F: Catastrophic Injury Reporting Mandate**.)

3. **Equipment.** Purchasers of equipment should be aware of and apply safety standards. Schools should provide equipment that meets certification requirements as set forth by applicable rules committees for each sport, such as using a NOCSAE-certified helmet. In addition, attention should be directed to maintaining proper repair and fitting of equipment at all times for all sport participants. Schools should provide all mandatory equipment and establish an education plan for student-athletes that includes:
   - Equipment that is mandatory and must be worn during participation.
   - What constitutes illegal equipment.
   - How mandatory equipment should be worn.
   - Steps to follow if their equipment becomes unsafe or illegal, including notification of coaching and/or support staff.
4. **Equitable Medical Care.** Member institutions should neither practice nor condone illegal discrimination on the basis of race, religion, ethnicity, gender, gender identity, age, disability or sexual orientation within their sports medicine programs.

   Availability and accessibility to medical resources should be based on established medical criteria (e.g., injury rates, rehabilitation) rather than the sport itself. Institutions should be encouraged to incorporate questions regarding adequacy of medical care, with special emphasis on equitable treatment, in exit interviews with student-athletes.

Each student-athlete should be afforded a reasonably safe environment protected from personal endangerment such as abuse, assault, hazing or harmful punishment.

5. **Facilities.** Schools should regularly examine the adequacy and conditions of the facilities used for intercollegiate athletics events/practices to ensure function and safety. Inspection of the facilities should include not only the competitive area, but also warm-up and adjacent areas. Athletic training facilities should adhere to local, state and federal regulations pertaining to health care facilities. The **Board of Certification Facilities Principles** provides guidance on best practices to ensure a safe health care facility.
6. **Safe Environments.** Member institutions should support a positive student-athlete development model through respect and sportsmanship. Each student-athlete should be afforded a reasonably safe environment protected from personal endangerment such as abuse (physical, sexual or emotional), assault, hazing or harmful punishment. Schools should put in place policies and procedures to immediately identify, report and protect individuals experiencing or reporting incidents of endangerment. These should align with institutional policies. Staff and students reporting such behaviors and incidents should be protected from negative repercussions. These policies should govern student-athletes, coaches and all support staff.
   - **Security and Safety Plan.** NCAA member institutions should develop a critical response plan to provide facility, staff, participant and fan safety for potential incidents such as bombings, riots, fire, natural disasters and terrorism threats.
   - **Blood-Borne Pathogens.** In 1992, the Occupational Safety and Health Administration (OSHA) developed a standard directed to minimizing or eliminating occupational exposure to blood-borne pathogens. Each member institution should determine the applicability of the OSHA standard to its personnel and facilities.

Guideline 1B

Independent Medical Care for College Student-Athletes

The NCAA recognizes independent medical care as a constitutional responsibility of all member schools. (See Constitution 2.4.) Specifically, schools must establish an administrative structure that provides independent medical care and affirms the unchallengeable autonomous authority of primary athletics health care providers (team physicians and athletic trainers) to determine medical management and return-to-play decisions related to student-athletes. Additionally, a school must designate an athletics health care administrator to oversee the athletic health care administration. (See **Guideline 1C: The Athletics Health Care Administrator**.) In Division I, schools are required to establish and annually review policies and procedures that empower the athletics health care administrator with the authority to oversee the school's athletics health care administration and delivery (See DI Bylaw 20). The **Interassociation Consensus: Independent Medical Care for College Student-Athletes Best Practices** provides more information.

Guideline 1C

The Athletics Health Care Administrator

The Athletics Health Care Administrator designation was established as part of Independent Medical Care legislation, which was adopted by all three NCAA divisions in 2017. Among other things, that legislation requires schools to "designate an athletics health care administrator to oversee the Institution's athletic health care administration and delivery." The legislation does not specify who may or must be designated as the AHCA, leaving the decision to the discretion of each school. Most NCAA schools designate an athletics health care provider (team physician or athletic trainer) as the AHCA. Around 60% of AHCAs are head athletic trainers.

Administration Considerations

Schools should review the **AHCA Handbook** for guidance and summary information about the following topics:

- NCAA health and safety efforts that support student-athletes.
- Role of the AHCA.
- NCAA health and safety-related legislation.
- NCAA interassociation health and safety recommendations.
- NCAA health and safety resources.
- Ways to contact the NCAA Sport Science Institute.

Schools should ensure the accuracy of their AHCA directory contact information and make updates as personnel changes take place. Changes to AHCA directory contact information may be made by designated institutional personnel with access to the **NCAA My Apps** environment or by contacting the NCAA National Office.

Background

Among other things, the AHCA serves as an administrative point of contact for the health and safety of college athletes, thus making them a key member of the athletics health care team regardless of their job responsibilities and/or professional training and background. The AHCA is intended to be an integral part of a broader obligation to establish a structure that supports the delivery of independent medical care for college athletes. (See **Guideline 1B: Independent Medical Care for College Student-Athletes**.) Early guidance to AHCAs identified three recommended functional responsibilities:

- Be aware of all NCAA health- and safety-related legislation, consensus-based guidance and resources.
- Share health and safety legislation, consensus-based guidance and resources with stakeholders within your athletics department and your campus.
- Monitor your athletics department health and safety policies and practices to ensure compliance with NCAA health- and safety-related legislation and establish consistency with consensus-based best practice guidelines.

The AHCA serves as primary point of contact at each member school and is the person best positioned to communicate directly with the NCAA Sport Science Institute and the NCAA National Office on matters of independent medical care and student-athlete health and safety. The AHCA serves in an administrative capacity that complements the athletics health care team.

Additionally, Division I legislation requires schools to establish and annually review policies and procedures that empower the athletics health care administrator with the authority to oversee the institution's athletics health care administration and delivery. The annual review must assess and affirm that the policies and procedures outline the role and responsibilities of the athletics health care administrator and consider positional authority, reporting lines, organizational structures and skills, knowledge and other qualifications required of the athletics health care administrator.

Guideline 1D

Removal for Medical Evaluation

In this guideline, removal for medical evaluation is used to refer to a temporary or time-limited withholding of an athlete from practice and/or competition because of an acute or preexisting medical condition, when it is determined that continued participation with that condition threatens the health and safety of that student-athlete or other participants.

Some national governing bodies and sports leagues have established policies to inform, and in some cases, require specific steps in the management of certain medical conditions, the most common of which is sport-related concussion. For example, NCAA legislation requires all schools to have a concussion management plan that includes specific provisions directing the management of a student-athlete with a suspected concussion. The concussion management plan must be consistent with the **NCAA Concussion Safety Protocol Checklist**, which contains considerations to inform the medical management of a student-athlete with a suspected concussion. (**See Guideline 5A: Concussion**.) The awareness of such policies by athletic health care providers is important because such policies effectively establish requirements for the medical management of certain conditions, including the removal and return of student-athletes from practices and/or competitions.

Administration Considerations

Authority to Remove a Student-Athlete from Athletic Activity for Medical Evaluation

The primary athletics health care provider or their designee has the sole authority and responsibility to determine when a student-athlete should be removed and/or withheld from participation due to an injury, an illness or other medical condition with the potential to impact the safety and well-being of either the athlete or other participants. Furthermore, clearance for a student-athlete's return to activity is solely the responsibility of the primary athletics health care provider or their designee.

In addition, NCAA legislation requires schools to have an administrative structure that provides independent medical care and affirms the unchallengeable autonomous authority of primary athletics health care providers (team physicians and athletic trainers) to determine medical management and return-to-play decisions related to student-athletes. (See **Guideline 1B: Independent Medical Care for College Student-Athletes**.)

Procedure to Remove a Student-Athlete During an NCAA Championship for Medical Evaluation

Guidance for medical authority during NCAA championship events is established in the individual operational manuals that inform those events.

- The NCAA tournament physician, as designated by the school or conference hosting the tournament event, has the unchallengeable authority to determine whether a student-athlete with an injury, illness or other medical condition (e.g., skin infection, communicable disease) may participate in the event without increased risk of harm to themselves or others. The NCAA tournament physician is empowered to remove the student-athlete from continued participation if it is determined that participation cannot continue safely. In tournament situations where an individual athlete or team is accompanied by their school athletics health providers, tournament medical staff offer consultation and typically give deference to those providers to make medical decisions.
- The chair of the governing sports committee (or a designated representative) shall be responsible for administrative enforcement of the final medical judgment if it involves removal for medical evaluation.

Guideline 1E

Preparticipation Physical Evaluation

The preparticipation physical evaluation (PPE), also known as a mandatory medical examination per NCAA legislation, or more colloquially as a "sports physical," is an integral component of a student-athlete's health record and serves as an important tool for supporting their mental and physical well-being as they begin their collegiate sports career. The PPE is considered a component of the student-athlete's medical record and is subject to state and federal laws with regard to confidentiality, content and authorization for disclosure (See **Guideline 1K: Health Records Administration**.)

Administration Considerations

Beyond existing NCAA legislative requirements, member schools should establish policies and procedures associated with PPEs that reflect existing best practices for the conduct of such examinations in athletes, as well as school, state and federal regulations. State health and education authorities and campus risk managers and legal counsel can assist in this effort.

Relevant considerations for such policies may include:

- Timing of the PPE.
- Methods of screening and execution of the PPE.
- Determination of participation status.

Background

Timing of the PPE

NCAA legislation requires that all student-athletes must undergo a mandatory medical examination within six months before initial participation in any practice, competition, out-of-season conditioning voluntary summer workouts or tryouts for enrolled students. In subsequent years of participation, schools must obtain an updated medical history within six months before the start of each academic year to determine if additional examinations are needed. Prospective student-athletes participating in tryouts must also undergo a mandatory medical examination within six months before tryout activities begin, except in Division II which allows the examination to occur within one year before tryout activities. See Division II tryout legislation for specifics.

Any licensed medical physician, including a team physician or the student-athlete's personal physician, may administer or supervise the mandatory medical examination. A nurse practitioner whose state medical licensure allows for health care practice independent of physician supervision may complete the mandatory medical examination. [Division I and II Bylaw 17.1.5; Division III Bylaw 17.1.6.4]

Ideally, the PPE occurs between four to six weeks before the start of preseason training. This time frame allows for thorough follow-up on any identified issues that may require further evaluation. However, it is also practical and acceptable to conduct the PPE on the actual day preseason training begins or the day before, given that student-athletes typically arrive one to two days in advance of the start of preseason practice. This shorter timeline may result in delayed clearance for some student-athletes who need additional evaluation.

Schools may cover the costs of the PPE or updated medical history as incidental medical expenses related to student-athletes' participation in intercollegiate athletics. Student-athletes must not participate in any practice, competition or out-of-season conditioning activities (or, in Division I, permissible voluntary summer workouts, or permissible required summer athletic activities in basketball and football) before undergoing the mandatory medical examination or receiving an updated medical history with clearance to participate. Transfer student-athletes must undergo a mandatory medical examination in their initial season of competition with their new school. Documentation from their former school may be required.

Methods of Screening and Execution of the PPE

A standardized approach to PPE contributes to consistency and repeatability over time and across patients. The recommended components of a comprehensive PPE should include a medical and musculoskeletal history, covering all medical conditions and surgeries, medications, allergies, family history, cardiovascular risk factors, nutrition, heat-related and hydration issues and mental health. For the physical examination, the Preparticipation Physical Evaluation monograph (5th edition)[1] suggests a basic screening to include vital signs and examinations of the cardiovascular, pulmonary, abdominal, skin, neurological and musculoskeletal aspects. Additionally, NCAA legislation requires that a PPE include a sickle cell solubility test, unless the student-athlete provides the school with documented results of a prior sickle cell solubility test. (See **Guideline 4D: Sickle Cell Trait**.) A comprehensive medical history and physical exam helps determine if additional physical, cardiovascular or neurological exams or testing are necessary. It also provides an opportunity to conduct baseline neuropsychological testing. (See **Guideline 5A: Concussion**.)

Screening for underlying cardiac conditions in the student-athlete requires special consideration. Accordingly, the NCAA, with the assistance of several sports medicine organizations, developed the **Interassociation Consensus Statement on Cardiovascular Care of**

College Student-Athletes.[2] Among other things, this statement addresses the broader purpose of the PPE, as well as special considerations for the screening of cardiac conditions. (See **Guideline 4E: Cardiovascular Care of the College Student-Athlete**.)

Barriers such as illiteracy and limited English proficiency can hinder the completion of an accurate medical history. These barriers can be addressed by hiring medical interpreters and/or providing forms translated into the athlete's language.

Increasingly, PPEs include the use of screening tools pertaining to mental health concerns or high-risk behaviors. The **NCAA Mental Health Best Practices** includes information about the use of mental health screening tools. (See **Guideline 6A: Mental Health Best Practices**.) Importantly, when using a screening tool, schools should establish plans and protocols for the use of the screening data.

Determination of Participation Status

The initial participation status for student-athletes can be categorized into five groups:

- Eligible without restriction.
- Eligible with recommendations for further evaluation or treatment.
- Not eligible until additional evaluation or rehabilitation is completed.
- Not eligible for specific activities.
- Not eligible for any sports or physical activities.[1]

Clearing a student-athlete for sports participation should rely on established guidelines and the best available evidence including relevant formal consensus guidelines and position statements. Shared decision making, whereby the patient is educated and participates in the process, can be used to determine restrictions.[3] However, in most circumstances, the team physician and school have the authority to limit a student-athlete's participation if the decision is based on sound medical evidence and personalized considerations.[3] Medical eligibility and recommendations for participation may change over time due to new injuries, illnesses, family medical issues or newly disclosed personal or family history.

In situations where a medical condition restricts eligibility, practitioners and student-athletes should engage in discussions about the risks and benefits of participating in desired activities, potential use of assistive devices or accommodations, risk to other participants and selection of alternative activities that may better suit the student-athlete.

References

1. Bernhardt DT, Roberts WO, eds. PPE: *Preparticipation Physical Evaluation Monograph. 5th ed.* American Academy of Pediatrics; 2019.
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3. Herring SA, Putukian M, Kibler WB, et al. Team physician consensus statement: return to sport/return to play and the team physician: a team physician consensus statement-2023 update. *Med Sci Sports Exerc*. May 1 2024;56(5):767-775. doi:10.1249/MSS.0000000000003371

Guideline 1F

Prevention and Management of Infectious Disease

The environments in which athletes compete, practice, receive therapy and travel warrant heightened awareness for prevention and early treatment to prevent possible community outbreaks. Infectious disease outbreaks not only affect the student-athlete but also the coaching and support staff and spectators in sports such as wrestling, rugby, gymnastics, soccer, swimming, fencing and triathlons.[1] While in most cases morbidity is mild, some, albeit rare, infections can result in life-threatening conditions. More commonly, infectious disease outbreaks can eliminate a single athlete or an entire team from competing. Furthermore, a potentially serious consequence is spread to social contacts outside of the athletic environment, creating a public health concern.

Infectious diseases comprise up to 50% of visits in high school and college athletics health care facilities.[2] Upper respiratory infections head the list, followed by gastrointestinal disorders and skin infections. (See **Guideline 1G: Skin Infections**.) Signs, symptoms and management strategies of common infectious diseases are described in multiple resources.[2,3] The American Medical Society of Sports Medicine Position Statement on Mononucleosis and Athletic Participation provides valuable guidance on mononucleosis, a common condition with implications for physical activity.[4]

Administration Considerations

The school's sports team should establish policies and procedures pertaining to prevention, identification and management of individuals with infectious diseases. These policies should address standard precautions for purposes of infection control.

Athletic hygiene practices

An infectious disease policy should address hygiene practices and include a delineation of who is responsible for student-athlete education, laundry and proper cleaning and maintenance of facilities and equipment.

Student-athlete education should address proper personal hygiene, including showering with soap and water after activity. Uniforms, towels and practice clothing should be washed after each use. Sharing of drinking vessels, mouth guards, towels, braces, sports equipment, personal hygiene items, and bathing soaps and sponges should be avoided.

Hand hygiene remains the cornerstone of reducing person-to-person infection transmission. When hand-washing facilities are not available, alcohol-based hand gel can be used. Health care personnel should wash their hands before and after touching patients.

Recognition and management of infectious disease

Before each academic year begins, schools should identify local resources for infectious disease testing and treatment. Schools should make available diagnostic testing services for those infectious diseases that require specific tests for a definitive diagnosis (e.g., Epstein Barr virus, Group A *Streptococcus, Streptococcus pneumoniae* and *Neisseria meningitides*, Influenza and COVID-19). Individuals exposed to communicable diseases should follow guidance from the CDC and local health departments pertaining to isolation, masking and disease management.

Immunizations

Proper immunizations play an important role in preventing infectious disease and/or in mitigating severe disease when an infection occurs. Consequently, knowledge of the immunization history of student-athletes is an important component of athletic health care administration.

Schools should consider policies and procedures that ensure determination of student-athlete immunization status as part of the intake and preparticipation examination process. (See **Guideline 1E: Preparticipation Physical Evaluations**.) Subsequent appointments with athletics health care providers provide opportunities to educate student-athletes and to update and review immunization status.

Infectious disease outbreaks can eliminate a single athlete or an entire team from competing.

Return to participation following illness

Schools should establish and clearly communicate return-to-play guidelines to all involved in the athlete's medical management.

Public health considerations

The obligation of health care providers to report the occurrence of an infectious disease (e.g., bacterial meningitis, COVID-19) varies by state and/or local public health departments. School policies should align with these obligations and identify a corresponding communication plan.[5]

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Guideline 1G

Skin Infections

Skin infections may be transmitted both directly (person to person) and/or through contact with microbes on the surfaces of inanimate objects (e.g., athletic equipment). Most transmission is through direct contact with either a person or a contaminated surface. Infection control measures can be used to reduce the risks of disease transmission. Early identification and treatment and preventing opportunities for infection transmission are the most important factors in avoiding skin infection outbreaks in an athletic setting.

▶ Administration Considerations

Policies and procedures pertaining to the prevention, early identification and treatment of skin infections are important administrative components of a comprehensive infection control program.

Schools should consider the below guidance:

For school athletic health care providers

- Maintain a high index of suspicion for skin infections.
- Use personal protective equipment, waste disposal and hand hygiene practices in accordance with all applicable standards (e.g., school policy, Occupational Safety and Health Administration standards).
- Evaluate all active skin lesions and lesions that do not respond to initial therapy.
- Facilitate the collection of cultures and/or the conduct of other diagnostic tests whenever feasible.
- Appreciate that antibiotic resistance patterns unique to sports venues exist and may influence drug selection.[1]
- Exclude from practice and competition all athletes with potential infectious skin lesions until the lesions are healed or can be properly covered.
- In student-athletes with active lesions but who have been medically cleared for practice and/or competition, ensure that skin lesions are properly covered before participation. “Properly covered” means that the skin infection is covered by a securely attached bandage or dressing that will contain any drainage from the lesion and will remain intact throughout the sport activity.

For school facility maintenance

- Establish routine cleaning schedules for shared equipment, locker rooms, health care facilities and practice facilities. Shared equipment that comes into direct skin contact should be cleaned after each use and allowed to dry. These procedures should be coordinated with the environmental service and/or custodial staff.
- Use cleaning agents appropriate to the surface:
  - Cleaning with detergent-based cleaners, bleach or Environmental Protection Agency-registered detergents/disinfectants will remove methicillin-resistant Staphylococcus aureus from surfaces.[2]
  - Equipment, such as helmets and protective gear, should be cleaned according to the equipment manufacturers' instructions to make sure the cleaner will not harm the equipment.
  - If using household chlorine bleach as a disinfectant for precleaned surfaces, use ¼ cup of bleach in 1 gallon of water (a 1:100 dilution equivalent to 500-615 parts per million of available chlorine).[2]
- Limit skin exposure to cleaning agents. Some cleaners, including chlorine bleach, have been associated with health problems such as asthma and skin and eye irritation. Personal protective equipment such as masks/respirators, gloves and eye protection may be indicated.[2]
- Equipment with damaged surfaces that cannot be adequately cleaned should be repaired or discarded.

For non-health care athletic personnel

- Refer to a medical provider for timely medical attention for any suspicious-looking skin wound or lesion, especially those that are red, swollen and/or seeping.
- Use liquid soap from a pump container instead of bar soap.
- Cover infections and open wounds. Ideally, coverings should be applied by a medical provider.
- Shower with soap and water immediately after physical activity.
- Avoid entering whirlpools or common tubs if you have active infections or open wounds.
- Avoid sharing towels, razors and wearable athletic gear.
- Avoid contact with other people's wounds or material contaminated from wounds.
- Wash athletic gear and towels after each use.
- Dispose of contaminated bandages in appropriate waste containers.
- Wear sandals in community showers.

Background

Many types of skin infections (e.g., viral, bacterial, fungal, parasitic) can be spread among people having close contact, of the kind that occurs in athletics, with infected individuals. Although less common, these infections also can be spread through contaminated inanimate objects, such as towels, sheets, wound dressings, clothes, workout areas, mats and other sports equipment. Multiple resources exist to guide identification, treatment and prevention of skin conditions.[3,4]

Skin Infections and Wrestling

The nature of wrestling with its body-to-body contact warrants specific rules pertaining to infectious skin conditions. **Appendix C of the Wrestling Rules Book** details requirements for pre-event screening, notification of existing conditions, participation requirements with regard to "adequate protection" and disqualification.

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Guideline 1H
Medication Management

Policies and procedures for using over-the-counter and prescription medications are an important part of an effective sports medicine unit. Although medications may be used for legitimate medical reasons, some medications may also be NCAA banned substances and require approval for use through the NCAA **medical exception process**. Additionally, having readily accessible medications in athletic health care facilities can pose legal risks that warrant careful attention and sound policies.

Administration Considerations

Schools should develop policies and procedures pertaining to the storage and disposal, documentation, administration and dispensing of over-the-counter and prescription medications. These policies should comply with applicable state and federal laws.

Background

The Inter-Association Consensus Statement: The Management of Medications by the Sports Medicine Team provides detailed recommendations pertaining to medication management.[1] Key points are summarized below.

Compliance with state and federal laws

All members of the sports medicine team should be aware of all applicable state and federal laws and regulations for storage, administration and dispensing of OTC medications, prescription medications and controlled substances. In some states, a physician can delegate administration and/or dispensing responsibilities of prescription and/or OTC medications to other specified health care providers. Distinct policies and procedures may be needed for controlled substances, drugs or chemicals whose manufacture, possession and use are regulated by law due to their potential for abuse and risk of dependence. Examples of controlled substances include drugs like oxycodone, methylphenidate (i.e., Ritalin) and diazepam (i.e., Valium).

Although athletic trainers are trained in the use of emergency medications such as epinephrine, naloxone, glucagon and beta-agonist inhalers,[2] state laws vary with regard to whether or not they are permitted to carry and/or administer these medications. Schools should consult with legal counsel and supervising physicians before implementing policies or practices that make such requirements of athletic training staff.

Storage, disposal and inventory

Policies should address where medications are stored and who can access them. Each location of stored prescription medications (physician travel bag or cabinet) should have a list of medications being stored and a record of the date, patient, medication and quantity dispensed, and who dispensed the medication.

Physicians, pharmacists or other personnel as state or federal law allows should conduct regular audits of drug inventories. If the person conducting the audit also dispenses the medications, the audit should be verified by another physician or pharmacist.

Expired medications and other pharmaceutical waste (e.g., partially used IV solutions and partially used medication vials) should be disposed of in accordance with local, state and federal laws.

Medications for team travel

Team physicians should consult with legal counsel and/or state and federal law when considering the implications of traveling with medications. Medical bags for carrying medications for team travel should be locked and have a written formulary of the bag contents along with the traveling team physician's contact information. The formulary should list the medications, their usage indications and the recommended dosing. These medications should be included in the annual audit. International travel may necessitate additional policies to conform with laws and customs regulations in other countries.

Over-the-counter medications vs prescription medications

"Athletic trainers may administer OTC medications in minimal quantities, under practice protocols, subject to the rules of their respective institutions and any applicable state regulations."[1(p.1108)] Noncertified/unlicensed personnel, including students, should not administer or dispense OTC medications. OTC medications should be dispensed in their original packaging, as repackaging brings concerns of accountability, contamination and liability. Records should be kept of all OTC medications given, including the date, patient name, medication, quantity, name of the person who administered the medication and the lot number

and expiration date of the medication. Any known medication allergies should always be determined before administering medications and health care personnel should provide proper drug education and counseling. Providers should document all medications used in the student-athlete's medical record.

Prescription medications may be dispensed by individuals authorized by the state to do so. Medication samples should be treated like other prescription medications, with documentation of the transfer from the pharmaceutical representative to the physician and then to the sports medicine facility inventory, along with the appropriate lot numbers and expiration dates. Physicians should dispense prescription medications in child-proof containers and document this usage in the student-athlete's medical record. (See **Guideline 1J: Health Records Administration**.) Accurate documentation is essential both for appropriate care and to justify the need and usage of some medications (e.g., stimulants, opiates) in case of a positive drug test. (See **Guideline 3H: NCAA Drug Testing and Substance Misuse Prevention**.) Physicians should prescribe iontophoresis and phonophoresis medications individually to a student-athlete, and their administration should be documented by the treating sports medicine team member in the medical record.

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Guideline 1l

Participation by the Student-Athlete with a Disability

In accordance with the recommendations of major medical organizations and pursuant to the requirements of federal laws (in particular, Section 504 of the Rehabilitation Act of 1976 and the Americans with Disabilities Act), the NCAA encourages **student-athletes with disabilities** to participate in intercollegiate athletics and physical activities to the full extent of their interests and abilities. Disabilities are not always permanent health conditions. Student-athletes may acquire a temporarily disabling health condition (e.g., following surgery) and the nature of the disability may change over time.

According to the ADA, a person with a disability is someone who:

- Has a physical or mental impairment that substantially limits one or more major life activities;
- Has a history or record of such an impairment (such as cancer that is in remission); or
- Is perceived by others as having such an impairment (such as a person who has scars from a severe burn).

Schools should consider the impact of each student-athlete's disability on an individual basis to avoid unnecessary restrictions. School sports medicine personnel can assess any enhanced risk of harm to the student-athlete or others and identify precautions to minimize any increased risk.

A disabled student-athlete should be given the opportunity to participate in an intercollegiate sport if they have the requisite abilities and skills with or without a reasonable accommodation.[1] Medical exclusion of a student-athlete from an athletics program should occur only when a disability presents a significant risk of substantial harm to the health or safety of the student-athlete and/or other participants that cannot be eliminated or reduced by reasonable accommodations. When student-athletes with disabilities are not otherwise qualified to participate in existing athletics programs, member schools should explore means to provide suitable sport and recreational programs in appropriate (e.g., integrated, adaptive) settings to meet the student-athlete's interests and abilities.[2]

Participation Considerations

Before a student-athlete with a disability participates in an athletics program, it is recommended that an institution require joint approval from the physician most familiar with the student-athlete and their disability, the team physician, an appropriate official of the school and the student-athlete's parent(s) or guardian(s) if the student-athlete is a minor. The school may also want to seek guidance from specialists. Due to the individual and potentially dynamic nature of a disability, the following factors should be considered on an individualized basis in determining whether the student-athlete may participate in a particular sport:

- Published information regarding the medical risks of participation in the sport with the student-athlete's disability.
- The current health status of the student-athlete.
- The demands of the sport and position(s) that the student-athlete will play.
- The availability of acceptable protective equipment or measures to effectively reduce the risk of harm to the student-athlete or others.
- The ability of the student-athlete [and, in the case of a minor, the parent(s) or guardian(s)] to fully understand the risks of athletic participation.[3]

Medical Release

When a student-athlete with a disability competes in the intercollegiate athletics program, it is recommended that the school execute a waiver to inform the student-athlete of the potential risks of participation and to release the institution from legal liability for injury or death arising from the student-athlete's participation with their disability. The following parties should sign this document: the student-athlete, their parent(s)/guardian(s) (if the student-athlete is a minor), the team physician and any consulting physician, a representative of the school's athletics department, and the school's legal counsel. This document evidences the student-athlete's understanding of their disability and the potential risks of athletic participation, but it may not immunize the school or any consulting physician(s) from legal liability for injury to the student-athlete.[3]

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Guideline 1J

Health Records Administration

Developing policies and procedures for the creation, maintenance, archiving and destruction of medical records is a necessary component of athletic health care administration. Sound policies and procedures and consistent adherence to them once established can facilitate continuity of patient care, protection of sensitive patient health information, effective communication among health care providers and the mitigation of legal risk.

Medical records typically include any information related to a student-athlete's past, present or future physical or mental health condition, medical treatment or any other health care services. For information to be relevant to the medical record, the source of the medical care does not matter – services may be delivered by school medical providers or external providers.

Standardizing policies for medical record administration, retention, access and security can be a complex task, especially when multiple departments and health care providers are involved. Collaboration and alignment with other offices on campus that maintain medical records, such as student health clinics, physician offices, counseling and testing centers and athletic training facilities are essential to ensure consistent and effective management of health care records across the campus.

Administration Considerations

Schools should establish and maintain policies and procedures for administration of health records. These policies and procedures should be compliant with federal, state and institutional rules and regulations and should be developed in consultation with school legal and risk management staff.

Health record administration policies should address the following:

- Components to be included as part of the student-athlete's medical record.
- Record format (e.g., physical or electronic), accessibility plan and security (including HIPAA and FERPA compliance).
- Record retention and storage requirements.

Background

Components of Student-Athlete's Health Record

The following items are typically considered to be standard components of a student-athlete's health record:

- **Patient Encounters:** A patient encounter includes any examination or intervention provided by an athletic trainer, physician or other health care provider and also communication about a patient's health status.[1] Consistently documenting patient encounters creates an accurate medical history, facilitates continuity of care among providers and guides the development of personalized treatment plans. All encounters, including routine treatments and medication distribution, should be documented. (See **Guideline 1H: Medication Management**.) Phone calls and electronic transmissions (e.g., text messages, emails) should also be considered part of the patient record.
- **Mental Health Conditions:** Schools should consider having specific policies about who has access to mental health records, including information such as treatment plans, crisis interventions, results of clinical tests, progress notes and psychiatric medications.
- **Referrals and Outside Records:** Student-athletes may see health care providers without school affiliations. Schools should maintain records of these referrals and outside medical records for coordination of care and avoidance of duplication of tests or treatments.
- **Labs, Testing and Imaging:** Medical records should include all laboratory tests, diagnostic imaging (e.g., radiographs and MRI), medical testing (e.g., ECGs and echocardiograms) and other lab-based screenings (e.g., sickle cell solubility test).
- **Preparticipation Physical Evaluations:** Preparticipation physical evaluations provide a comprehensive assessment of the student-athlete's overall health and readiness for athletic participation. (See **Guideline 1E: Preparticipation Physical Evaluations**.) They are often performed by medical providers with no affiliation to the school, making coordination of outside records an important factor in medical record administration.
- **Clinical Screening Tools:** Clinical screening tools, including those related to concussions, mental health status and nutrition status, can provide useful and relevant information about the student-athlete's readiness (or lack thereof) for sports participation.
- **Immunizations:** Accurate immunization records allow health care providers to monitor vaccination status and advise on any required booster shots, contributing to the overall health and well-being of student-athletes. The school may also have established recommendations or requirements pertaining to other vaccinations (e.g., influenza, COVID).
- **Medical Clearance After Illness or Injury:** Documentation of clearance for return to play following injuries or illnesses establishes a formal determination by the physician or their designee that a student-athlete is medically fit to resume athletic activities and is discontinuing medical care for that health condition.

Appropriate retention periods for medical records may vary by jurisdiction and school and may also be influenced by ongoing insurance requirements.

Other health- and participation-related documentation, such as medical hardship waivers, authorizations to share information and emergency contact information may also be included with the student's health record.

Record Retention and Storage

Schools should establish record retention and storage policies in line with federal and/or state requirements for medical documentation. Appropriate retention periods for medical records may vary by jurisdiction and school and may also be influenced by ongoing insurance requirements, including **NCAA-specific insurance programs** that may apply to student-athletes following the completion of their eligibility.

Record Format, Accessibility Plan and Security

Schools should develop and regularly evaluate their standardized strategy for the format of their medical records. Paper records, while once the norm, present a spectrum of challenges including susceptibility to physical theft, loss, unauthorized access, disorganization, limited storage space and potential data integrity issues stemming from handwritten entries. Moreover, the vulnerability of paper records to disasters such as fires or floods jeopardizes the retrieval of critical patient data and exposes institutions to substantial risks. Electronic health records are generally more thorough, legible and accessible at the point of care. Some EHRs can also be shared across health care providers and clinical systems, can streamline coding and billing and can improve health care through automation, reminders and identification of potential provider errors. EHRs also simplify aggregation of patient information to support quality improvement initiatives.[1]

Schools should develop and implement policies satisfying **FERPA** and/or **HIPAA** requirements and other applicable federal, state and institutional regulations. These policies should address access to records and transfer of records to other schools. The student-athlete (or their guardian, if under 18 years old) should provide written authorization to release all personal health information, and that authorization must indicate what specific information may be released, to whom and for what length of time.

School policies should also strive to ensure that all communications (including texts, emails, telehealth, etc.) between providers and/or patients comply with HIPAA and/or FERPA guidelines, as well as any applicable federal, state and institutional requirements.

Reference

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Guideline 1K

Emergency Action Plans

Reasonable attention to all possible preventive measures will not eliminate athletic-related injury, illness or life-threatening conditions; however, creation, rehearsal and review of emergency action plans is an essential part of administering athletics health care on campus. Like student-athlete mental and physical health and safety in general, an emergency action plan is a shared responsibility of the athletics department. Athletics administrators, the Athletics Health Care Administrator, coaches, medical personnel and any other individual involved with the organization or sponsorship of athletic activities should all play a role in the establishment of the plan, the procurement of resources, as well as the understanding and rehearsal of appropriate emergency response procedures.[1]

Administrative Considerations[1-3]

- An emergency action plan should be consistent with the **Interassociation Recommendations: Preventing Catastrophic Injury and Death in Collegiate Athletes**, which is an Association-wide policy.
- An EAP consists of written documents that are shared with team athletics health care personnel, athletics administrators, facility/event personnel, campus safety personnel, coaches and any other personnel that the school deems necessary. The plan is developed by an interdisciplinary team and includes consultation with local emergency medical personnel and review by the school's legal counsel.
- Critical review of an EAP occurs at least annually and after each episode of activation to determine if changes are needed.
- Rehearsal of the EAP with all involved personnel occurs at least annually. Schools should maintain a record of these rehearsals.
- Schools should consider appointing a designated EAP coordinator, who is responsible for development, implementation, distribution and review of the EAP.

It is recommended that components of a well-rehearsed and venue-specific emergency action plan should include the following:

- The identification of qualified personnel involved in carrying out the plan and who are delegated to render appropriate emergency care to a stricken participant.
- The presence or planned access to a physician for prompt medical evaluation of the situation, when warranted.
- Planned access to early defibrillation and CPR.
- Planned access to an emergency care facility, including a plan for communication and transportation between the athletics site and the medical facility for prompt medical services, when warranted.
- Planned access to a working telephone or other telecommunications device, whether fixed or mobile.
- A plan to ensure that emergency information for participants is available both at the campus and while traveling for use by medical personnel. This emergency information should include the participant's full name, emergency contact person with associated contact information, insurance information and pertinent medical history.
- A plan for review of the EAP prior to any athletic activity (practice or competition). This review should include anyone who is a part of the emergency response team for that given activity. For athletic contests, the host medical providers should review the EAP with the visiting team medical personnel, ensuring that venue-specific features, available emergency personnel, equipment, a communication plan and any other necessary details have been identified.
- Certification in cardiopulmonary resuscitation techniques (CPR), automated external defibrillation, first aid and the use of personal protective equipment to prevent disease transmission is required for all athletics personnel associated with practices, competitions, skills instruction, and strength and conditioning.
- A provision that the school's sports medicine staff has the unchallengeable authority to cancel or modify a workout for health and safety reasons (e.g., environmental changes). (See **Guideline 1B: Independent Medical Care for College Student-Athletes**.)
- Schools should ensure that the venue-specific EAP incorporates roles and responsibilities of coaching staff, medical staff, spectators and others during the initial evaluation/response on the field, to ensure appropriate first response and medical evaluation. The EAP should state that appropriate medical staff will have access to the injured participant without interference.

Critical review of an EAP occurs at least annually and after each episode of activation to determine if changes are needed.

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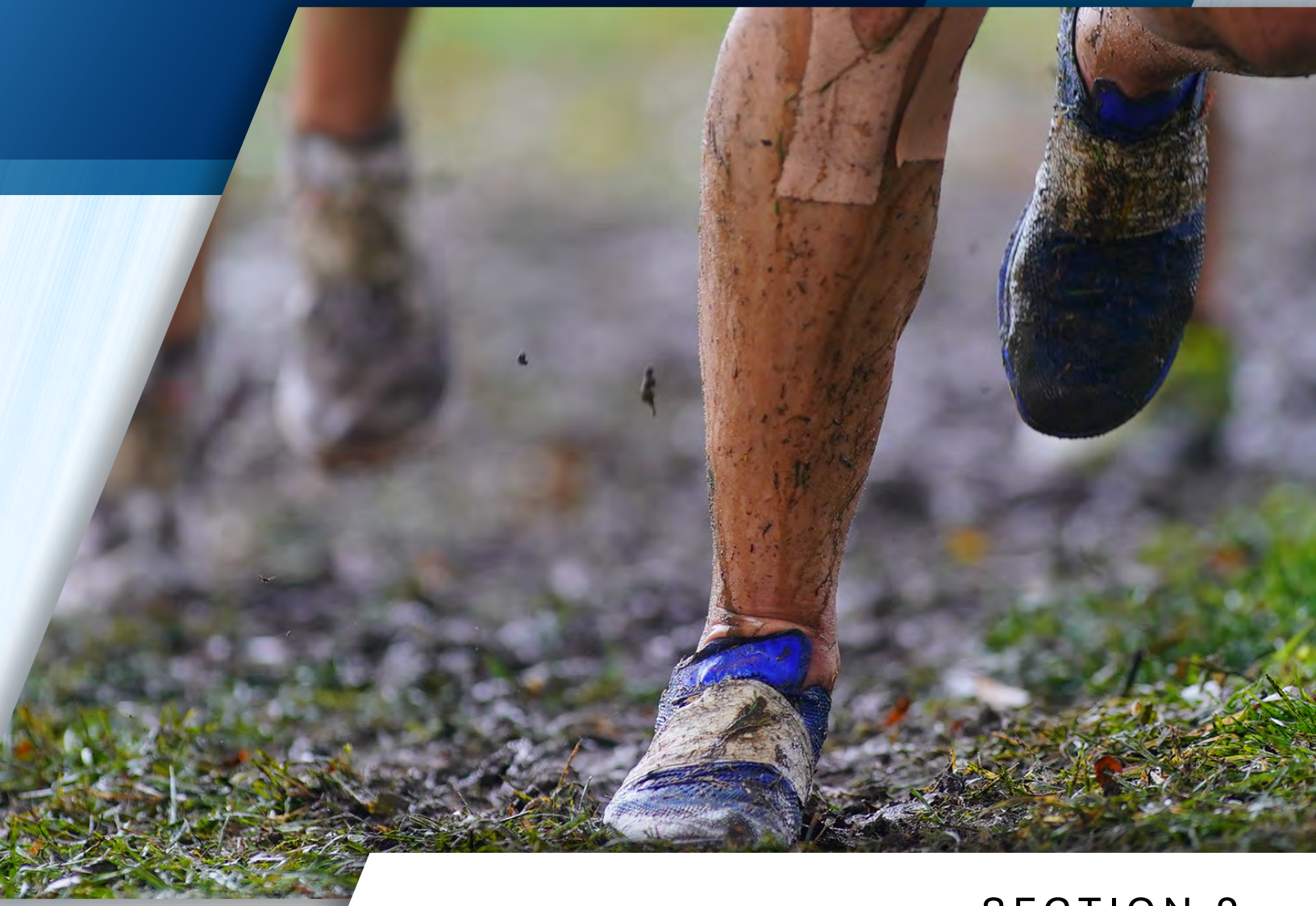


SECTION 2

Environmental Considerations

Guideline 2A

Cold Stress and Cold Exposure

Individuals can lose body heat when exposed to cold air. An inability to maintain body temperature during physical activity can be uncomfortable, impair performance, induce injury and may be life-threatening. Prevention of injuries from cold exposure is possible by following established policies and procedures.

▶ Administrative Considerations[1-3]

Schools should consider establishing policies and procedures that address the following:

- A plan to monitor environmental conditions and determine standards for activity modification or cancellation. The procedures should include:
  - The measurement tools to be used and what ambient, precipitation and wind chill standards will influence decision-making.
  - Who will monitor conditions and determine modifications to participation.
  - A plan for rewarming during and after activity and when that plan is activated.
  - A plan for communicating participation status to all involved parties.
- A plan to evaluate and care for individuals showing signs and symptoms associated with cold exposure. This plan should include equipment to have available (e.g., rectal thermometer, blankets, additional clothing).
- A plan to identify individuals who are at greater risk of suffering from cold exposure and monitor their participation accordingly.
- Educational programming for student-athletes and coaches to prevent injury from cold exposure. Programming should include information on signs and symptoms associated with harmful cold exposure, appropriate clothing, nutrition and hydration.

Background

A person may exhibit cold stress due to environmental or nonenvironmental factors. Injuries from cold exposure are due to a combination of low air or water temperatures and the influence of wind on the body's ability to maintain a normothermic core temperature, due to localized exposure of extremities to cold air or surface.[2] Nonenvironmental influences include previous cold weather injury, race, geographic origin, ambient temperature, use of medications, clothing, fatigue, hydration, age, activity, body size/composition, aerobic fitness level, clothing, acclimatization and low caloric intake. Nicotine, alcohol and other drugs may also contribute to how the person adapts to the stresses of cold.[1,2]

Prevention of Cold Exposure Health Conditions

Education is the key to decreasing the likelihood of cold exposure injury or illness.

Clothing. Individuals should be advised to dress in layers and try to stay dry. Moisture, whether from perspiration or precipitation, significantly increases body heat loss. Layers can be added or removed depending on temperature, activity and wind chill. Moisture-wicking fabrics like polypropylene and wool are preferred for layers next to the skin. Lightweight pile or wool layers follow, and a wind-blocking garment can be used to avoid wind chill. The head, ears and hands should be covered and a face mask worn if possible. Mittens are preferred over gloves. The use of emollients for protection on the face should be discouraged due to the increased risk of facial frostbite.[3] Those at risk for exercise-induced bronchospasm should wear a mouth covering.

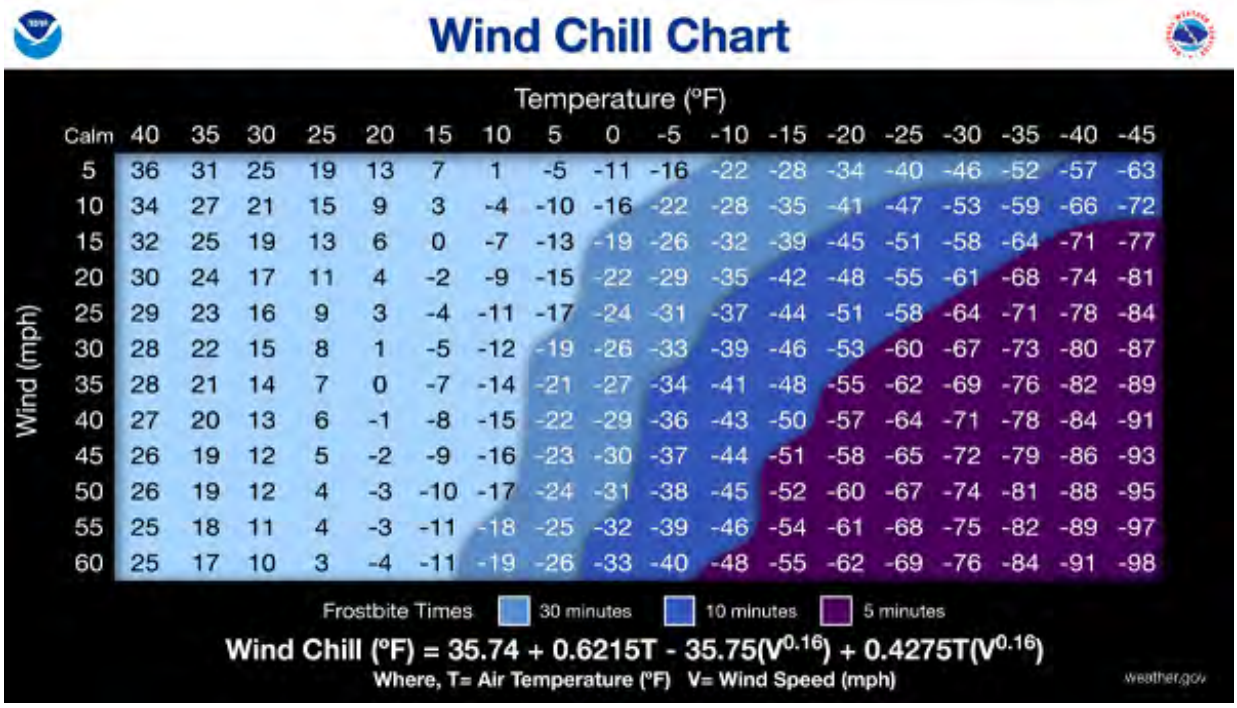
Food and Hydration. Negative energy balance and dehydration increases susceptibility to hypothermia and frostbite, so student-athletes should be educated on the need to consume adequate food and fluids. Alcohol, caffeine, nicotine and any other drugs that cause fluid loss or vascular changes should be avoided.

Fatigue and Exhaustion. Exertional fatigue and exhaustion increase the susceptibility to hypothermia, as does sleep loss.

Warmup/Activity Plan. A thorough warmup and a plan to keep participants moving is essential to prevent a drop in body temperature. The warmup should occur immediately prior to competition.

Identification of Those with Risk Factors. Individual health characteristics can predispose a person to cold-related injuries and warrant additional precautions to prevent injury. Risk factors for cold-related injuries include a history of certain health conditions (e.g., Raynaud's phenomenon), previous physical reactions to cold (e.g., cold urticaria) and use of medications that influence the nervous and vascular systems (e.g., benzodiazepines, beta blockers).[3]

Plan for a Partner. Student-athletes should not train alone in cold weather. An injury or delay in recognizing early cold exposure symptoms could become life-threatening if they occur during a cold-weather workout in an isolated area.



Weather Monitoring

To identify cold stress conditions, schools should take regular measurements of environmental conditions by referring to the Wind Chill Temperature (WCT) index. The WCT incorporates both wind and temperature to get a "feels like" temperature. Because wind removes heat from the body in addition to low ambient temperature, activity decisions should be based on the WCT and not ambient temperature alone. The WCT does not account for precipitation (rain, snow), and thus activity recommendations should be more conservative when it is wet. The Wind Chill Chart (Figure) shows the time it takes for frostbite to occur in exposed skin for any combination of ambient temperature and wind speed.[4]

The following guidelines, as outlined in the 2008 NATA Position Statement,[2] can be used in planning activity depending on the WCT. Schools should continually reevaluate conditions for changes in risk, including the presence of precipitation:

- 30°F (-1.11°C) and below: Be aware of the potential for cold injury. Notify appropriate personnel of the potential.
- 25°F (-3.89°C) and below: Provide additional protective clothing. Cover as much exposed skin as practical. Provide opportunities and facilities for rewarming.
- 15°F (-9.44°C) and below: Consider modifying activity to limit exposure or to allow more frequent chances to rewarm.
- 0°F (-17.78°C) and below: Consider terminating or rescheduling activity.

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Guideline 2B
Lightning Safety

Each year, thunderstorms produce an estimated 20 to 25 million cloud-to-ground lightning flashes in the United States, making them one of the most consistent and significant weather hazards that may affect intercollegiate athletics. Each year, on average, 300 people nationwide are struck by lightning, causing 30 fatalities. Approximately two-thirds of these deaths are associated with outdoor recreational activities, and sport-related activities account for a significant number of those fatalities. While the probability of being struck by lightning is low, thunderstorms can still pose a significant risk to health and safety.[1]

Given the prevalence of lightning strikes and the risks associated with outdoor athletic participation and attendance at such events, a lightning-specific emergency action plan is important, with education and prevention being key components.

▶ Administrative Considerations

To mitigate hazards associated with lightning, schools should include in their emergency action plan a lightning safety plan that addresses the below components.[1-3] Schools should consider educating all personnel on the plan at least annually.

Considerations for suspending an activity and/or evacuating a venue

- If thunderstorms appear imminent, schools should consider postponement, cancellation or (if possible) moving the activity indoors.
- Promoting slogans endorsed by the National Weather Service, such as "When thunder roars, go indoors," "No place outside is safe when thunderstorms are in the area" and "Half an hour since thunder roars, now it's safe to go outdoors" can be helpful tools for educating personnel in lightning safety.
- If an event has already begun when inclement weather occurs, the lightning safety plan should be immediately implemented.
- In general, a lightning threat extends outward from the base of a thunderstorm about six to 10 miles. Establishing when to clear the venue depends on how long it will take for all individuals to evacuate the premises (including spectators), leave the outdoor facility and take shelter within an identified safe location.
- Schools should monitor weather conditions using accurate methods to make decisions regarding the suspension of activities. Subscribing to a commercial lightning detection service that has been independently and objectively verified may be a helpful component of a lightning safety plan.
- Additional criteria for when to stop activity and evacuate a venue could include seeing lightning, hearing thunder and/or the appearance of threatening-looking skies. The ability to see lightning or hear thunder can be impacted by the time of day, visual obstructions and background noise, making accurate weather radar and lightning detection tools critical in the assessment of dangerous weather conditions.

Decision-making and communication for venue evacuation

- Establish a chain of command so that when inclement weather occurs, appropriate personnel are notified of an impending storm. These personnel should have unchallengeable authority to suspend activity due to dangerous weather.
- Establish a designated weather watcher before activity begins. The weather watcher is responsible for monitoring the weather, using weather monitoring tools and notifying the chain of command if dangerous weather is nearby. The weather watcher should not be a coach, umpire or referee, as they cannot adequately monitor the weather conditions given their other responsibilities.
- Establish a plan to communicate when activity has been suspended and a venue evacuation is necessary. The communication plan should address how to communicate the need for the evacuation and appropriate direction to the nearest safe location. These plans may differ based on the type of event, size of the venue and distance to the safe location. Planned instructions and announcements for participants and spectators, designation of warning and all clear signals, proper signage and designation of a safe location from the lightning hazard are all key components of the lightning safety plan. Several methods of alerting spectators and participants of an incoming storm may be necessary and may include a siren/alarm, a public address system and text messages.

Safe locations

- Locations such as dugouts, rain or picnic shelters, sheds or press boxes may not be safe from a lightning hazard.
- Safe locations are fully enclosed buildings with both plumbing and wiring. Injuries have been reported inside safe buildings, so occupants should stay in interior rooms and away from electrical appliances and plumbing fixtures.[1]
- In the absence of a fully closed, sturdy building, a hard-topped metal vehicle such as a car or bus (with the windows and doors closed) can provide adequate protection.
- Directional signage, safe location identification, safety information in event programs and brochures, information on scoreboards, assistance from ushers and appropriate ingress and egress are all important features for a safe evacuation.

Resumption of play

- Electrical charges can linger in clouds after a thunderstorm has seemingly passed, so activity should remain suspended until 30 minutes after the last sound of thunder is heard or the last strike of lightning is seen. This 30-minute clock restarts for each lightning flash seen or thunder heard.
- If the venue is consulting with a professional meteorologist that is using real-time lightning cloud-to-cloud and cloud-to-ground data, other criteria can be considered for determining earlier, safe resumption of play.[4]

Emergency care

- Lightning and active thunderstorms present a risk to participants and spectators as well as emergency and medical personnel. Before entering a venue to render care, emergency personnel should ensure the venue is safe and should not put themselves in danger if the threat of lightning is still imminent.

Lightning Policy Recommendations Checklist

- ❑ Create and enforce a comprehensive lightning and safety policy.
- ❑ Enforce "when thunder roars, go indoors."
- ❑ Identify the nearest appropriate and safe shelters in the EAP.

Lightning Procedure Checklist

Components of the lightning policy

- ❑ Communication guidelines for weather monitoring.
- ❑ Protocol for lightning-strike prevention.
- ❑ Procedure for proper emergency management of lightning strike.
- ❑ Education training.
- ❑ Criteria for resumption of activity.

Communication guidelines for weather monitoring

- ❑ Establish a chain of command and identify the person(s) responsible for suspending activity.
- ❑ Instill and promote awareness about lightning and changing or unstable weather conditions and determine a reliable weather source.
- ❑ When appropriate, cancel or postpone activity before the event begins and prevent athletes or spectators from entering the venue.

Procedure for lighting strike prevention

- ❑ Promote lightning safety slogans, such as "when thunder roars, go indoors."
- ❑ Identify safe locations.
- ❑ Identify and avoid unsafe locations.

Procedures for lightning strike management

- ❑ If an athlete or multiple athletes are struck by lightning, ensure your personal safety before assisting others.
- ❑ Carefully move the injured athlete(s) to a safer location, and call 911 (activate EAP).
- ❑ Provide appropriate care within the scope of training, which may include CPR and AED use and rescue breathing.
- ❑ Depending on the number of athletes involved and the severity of the injury, provide care to those with the most life-threatening injuries while waiting for EMS to arrive.

Education information for member leaders and member coaches

- ❑ Educate on proper prevention strategies and safe locations when lightning is in the area.
- ❑ Educate on managing an athlete who is struck by lightning.
- ❑ Educate as to when the event should be postponed due to lightning and when it is safe to resume activity.

Criteria for cancellation or resumption of activity

- ❑ Postpone or suspend activities if a thunderstorm is expected before or during the event.
- ❑ Activities should be suspended until 30 minutes after the last strike of lightning is seen and the last sound of thunder is heard.
- ❑ The 30-minute clock restarts for each lightning flash within 6 miles (9.7 km) and each time thunder is heard.

Table. Lightning Policy Checklist.[2] Reprinted with permission.

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Guideline 2C
Sun Protection

More than 250,000 NCAA student-athletes participate in outdoor sports. Exposure to sunlight or ultraviolet (UV) light has a profound effect on the skin, causing damage that can include premature skin aging, eye damage, immune system suppression and skin cancer.

Skin cancer, the most common type of cancer, is largely preventable by limiting exposure to sunlight, the primary source of UV radiation. Melanoma, the third most common type of skin cancer, accounts for less than 5% of skin cancer cases but causes a majority of skin cancer deaths.[1]

Administrative Considerations

Schools should encourage practices that reduce the negative health consequences of sun exposure through education and access to protective clothing and sunscreen for staff and student-athletes participating in outdoor activities.

When feasible, schools should consider limiting outdoor activities when UV exposure is highest (e.g., midday).

Research suggests that most student-athletes do not regularly wear sunscreen.

Background

Risk Factors

People with high levels of exposure to UV radiation are at an increased risk for all major forms of skin cancer. Approximately 65% to 90% of melanomas can be attributed to exposure to UV radiation, and because a substantial percentage of lifetime sun exposure occurs before age 20, UV light exposure during childhood and adolescence plays an important role in the development of skin cancer. Other risk factors include lighter natural skin color and skin that burns, freckles, reddens easily or becomes painful in the sun; appearance of moles (particularly an increased number of moles or an atypical mole or changing mole); family history of skin cancer; increasing age; and use of artificial UV radiation such as tanning beds.

Environmental factors that increase the amount of UV radiation exposure are also important to note, including latitude (closer distance to the equator), higher altitude, light cloud coverage and the presence of materials that reflect the sun (e.g., snow, pavement, water, sand).[2]

Prevention and Education

Unprotected skin can be damaged by the sun's UV rays in as little as 15 minutes. In addition to avoiding sun exposure during peak daylight hours, photoprotective measures include:

- Wearing sun-protective clothing with an ultraviolet protection factor (UPF) of 40–50.
- Applying sunscreen with a sun protection factor (SPF) of 30 or greater.
- Reapplying sunscreen after two hours of activity and after swimming or toweling off.
- Wearing hats and sunglasses.
- Avoiding tanning beds and other artificial sources of UV light.

Research suggests that most student-athletes do not regularly wear sunscreen, with forgetfulness an often-cited reason. Coaches and athletic trainers should ensure that student-athletes are educated about and have easy access to sunscreen, as both are effective strategies to increase its use.[3,4]

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SECTION 3

Performance and Training

Guideline 3A

Assessment of Body Composition

Athletic performance depends, to a great degree, on the ability of the student-athlete to overcome resistance and to sustain aerobic and/or anaerobic power. These elements of performance have important training and nutritional components and may be influenced by the student-athlete's body composition. Each student-athlete has a unique optimal body composition for performance, health and self-esteem. Coupled with the common perception of many student-athletes who compete in sports in which appearance is a concern (swimming, diving, gymnastics, skating, etc.), attainment of an "ideal" – as opposed to "optimal" – body composition often becomes a central theme of training.

There are no data to support a specific body weight or body fat percentage for any given sport. Even within a sport, athletes may be successful with a wide range of body weights and compositions. Successful student-athletes achieve a body composition within a range associated with optimal performance in their sport and appropriate for their genetic makeup.[1] Each sport has different norms for the muscle and fat levels associated with a given height, and the student-athlete's natural genetic predisposition for a certain body composition may encourage them to participate in a particular sport or take a specific position within a sport. For instance, football players on the offensive or defensive line have different responsibilities than receivers, and their physiques are also different.

Besides aesthetics and performance, safety may be linked to an optimal body composition. A student-athlete who is carrying excess weight may be more prone to injury when performing difficult skills compared to a student-athlete

with a more optimal body composition. Conversely, an athlete who is too lean may be at higher risk for injury from stress fractures and soft tissue damage. Whatever changes a student-athlete may be seeking, the ways they attempt to achieve an optimal (or what they perceive to be an optimal) body composition may be counterproductive. For example, energy restriction and excessive training often result in such a severe energy deficit that, while total weight may be reduced, the constituents of weight also change — often to a lower muscle mass and a relatively higher fat mass. The resulting changes inevitably reduce performance, motivating the student-athlete to follow regimens that produce even greater energy deficits. This downward spiral may be the precursor to disordered eating and/or eating disorders that place the student-athlete at serious health risk. Therefore, while focusing on body composition changes may initially improve athletic performance, how student-athletes attempt to attain an optimal or perceived optimal body composition may reduce athletic performance, place them at a higher injury risk and increase risks to their health.[2]

▶ Administrative Considerations

Schools should consider establishing policies and procedures pertaining to body composition testing that include the following components:

- Who is responsible for testing. It is recommended that testing is conducted by the sport science, sports nutrition or sports medicine team.
- An explanation that the school uses body composition assessment only for legitimate reasons, such as helping student-athletes and coaches understand changes that are occurring from training and nutritional factors.
- A plan for educating student-athletes about body composition testing and a process for obtaining each person's consent to participate.
- The assessment methods to be used. Various methods exist, but the most common include dual-energy X-ray absorptiometry (DXA), air displacement plethysmography (ADP), skinfold and bioelectrical impedance analysis (BIA). Of these, DXA is considered by many to be the gold standard.
- The frequency of body composition assessments. Assessments should occur two to four times per year or between training phases.
- How results are used and with whom they are shared. Staff should explain to student-athletes that their results should be placed in context of norms for a position, a team or a given sport and interpreted as ranges rather than a specific number. An interdisciplinary team should develop individualized and comprehensive sports performance plans. Policies should address what data is shared with those who control playing time or workouts given the perception that this information can be used against the student-athlete. Policies should address additional health and safety considerations for student-athletes with eating disorders and/or related mental health conditions.
- A plan for regular education of coaches and staff in strategies to create a positive organizational culture around body composition.

Background

Purpose of Body Composition Assessment

The purpose of body composition assessment is to determine the student-athlete's distribution of lean (muscle) mass and fat mass. A health care provider may choose to measure body composition to: (1) address concerns about the health of an athlete; (2) monitor lean and fat mass regularly, to compare them to performance and determine contributions to performance; (3) assess and monitor bone mineral density; (4) optimally prepare an individual for a sport-specific performance; (5) avoid chronic injury, or track progress and lean mass maintenance or return before and after surgery and throughout rehabilitation; and (6) track patterns of training volume.[2] A high ratio of lean mass versus fat mass is often synonymous with a high strength-to-weight ratio, frequently associated with athletic success. However, there is no single ideal body composition for all student-athletes in all sports. Student-athletes who try to achieve an arbitrary body composition that is not right for them are likely to place themselves at health risk and will not achieve the performance benefits they seek. Therefore, a key to body composition assessment is establishing an acceptable range of lean and fat mass for an individual student-athlete. Importantly, there should be just as much attention given to changes in lean mass (both in weight of lean mass and proportion of lean mass) as to body fat percentages.

In the absence of published standards for a sport, one strategy for determining body composition standards is to obtain a body fat percentage for each student-athlete on a team (using the same method of assessment) and

obtaining an average and standard deviation for body fat percentage for the overall team. Student-athletes who are within 1 standard deviation (i.e., a Z-score of ± 1) of the team mean should be considered within the range for the sport. Those at ± 1 standard deviation could be evaluated if there is concern about their performance, to assess the appropriateness of their training schedule and nutrient intake. They could also undergo functional performance measures to help assess the appropriateness of their body composition. Student-athletes whose body fat percentage is outside the observed normal range for the sport may have achieved an optimal body composition for their genetic makeup and may have objective performance measures (e.g., jump height) that are well within the range of others on the team.

Body Composition Assessment

Body composition testing should be conducted by a qualified person from the sports nutrition or sports medicine staff. Prior to testing, the student-athlete should be educated regarding the purpose and goal, proper attire, what to expect during testing and how the results will be handled. The person conducting the assessment should obtain consent from the student-athlete to participate in body composition testing and for their data to be shared with the appropriate interdisciplinary staff. No student-athletes should be forced to undergo body composition testing.

- **Assessment Methods**
  Body composition can be measured indirectly by several methods, including hydrostatic weighing, skinfold and girth measurements (applied to a nomogram or prediction equation), BIA, ADP, DXA, ultrasound, computed tomography, magnetic-resonance imaging, isotope dilution, neutron-activation analysis, potassium-40 counting and infrared interactance. The most common methods now used to assess body composition in student-athletes are skinfold measurements, DXA, ADP and BIA. Hydrostatic weighing and DXA are considered by many to be the "gold standards" for indirect measurement techniques, although hydrostatic weighing is no longer used by many due to its impracticality.[3] Skinfold-based prediction equations generally use hydrostatic weighing or DXA as the criterion methods, and thus typically carry the prediction errors of those methods plus the measurement errors associated with obtaining skinfold values. BIA and ADP have become popular because of their noninvasiveness and speed of measurement. However, BIA can be significantly influenced by hydration state. Since student-athletes' hydration states change constantly, BIA results may be misleading unless strict hydration protocols are followed. All of the commonly used techniques provide only estimates of body composition, and

Student-athletes who try to achieve an arbitrary body composition that is not right for them are likely to place themselves at health risk and will not achieve the performance benefits they seek.

since each technique uses different theoretical assumptions to predict body composition, results obtained from one technique should not be compared with another.[3,4]

- **Frequency of Body Composition Assessments** Student-athletes whose weight or body composition is frequently measured are often fearful of the outcome, as coaches who conduct frequent measurements may use punitive actions to address what they believe to be undesirable results. Day-to-day weight changes reflect changes in hydration status, while real changes in body composition occur slowly. Thus, there is little need to assess student-athletes' body composition weekly, every two weeks or even monthly. If body composition measurements are adequate and agreed upon by all parties, assessing them two to four times per year or between training phases should be sufficient. In some situations, teams that may decide body composition measurements are not necessary for training determinants or performance assessments. However, if a student-athlete has been injured or is ill, it may be reasonable for a physician or registered dietitian to recommend more frequent assessments to monitor changes. In assessing student-athletes at risk for bone stress injuries, additional testing may be recommended. Student-athletes or coaches who desire more frequent body composition measurements should shift their focus to objective performance-related measures.
- **Handling of Results and Communication Strategy** Body composition results can be used to track changes in fat-free mass and fat mass over time (between training phases and over an athlete's career). With the student-athlete's consent, results can be shared with appropriate interdisciplinary staff if they would be appropriate and helpful in developing a comprehensive and individualized sports performance training plan. Body composition data are protected health information and fall under HIPAA and FERPA guidelines. Thus, as noted above, every school that assesses body composition should have a policy outlining what and how data are shared and with whom.
- Student-athletes are entitled to see their results. The appropriate interdisciplinary staff members should explain to student-athletes that all types of body composition are estimates, and that an individual's results should be placed in context of norms for a position, a team or a given sport.

Considerations with Body Composition Assessments

Measurement Error

Every method of body composition has a known standard error of the estimate (SEE), which relates to its accuracy. This is because fat mass and fat-free mass are calculated from equations or algorithms, not directly measured. Thus, accuracy of body composition measures depends on the population in whom these equations and algorithms were developed. Differences between the population being tested and the one that the equations or algorithms are based upon may lead to additional errors in accurately estimating body composition. When results are communicated to student-athletes, these errors should be incorporated and the results explained as occurring within a range (i.e., measured percent ± the SEE). For example, if the SEE is ± 1.5%, then a measured result of 12% should be considered and reported as a range of 10.5-13.5%. Using a range of measurements also improves reliability of subsequent measurements, where change cannot truly be detected unless subsequent measurements exceed the published SEE.

Using Weight as a Marker of Body Composition

While collecting weight data is a necessary adjunct to body composition assessment, by itself weight may be misleading. For instance, young student-athletes expect to grow and gain weight, so gradual increases in weight should not be interpreted as a body composition problem. A student-athlete who has increased resistance training volume or frequency to improve strength may also increase

body weight, but since this increase is likely the result of adding muscle, this change should be viewed as positive. Weight is often mistaken for a measure of body composition, which it is not. This error can detract from the purpose of body composition assessment and potentially cause mental and/or emotional harm to student-athletes or encourage unhealthy behaviors.

Tracking of body weights or routine weighing of student-athletes should be conducted

and shared only by and between the appropriate interdisciplinary staff. When tracking weight for purposes other than hydration, it should be limited to weekly monitoring by the registered dietitian or athletic trainer.

Comparing Body Composition Values with Other Athletes

Student-athletes often compare body composition values among themselves, but this comparison is not meaningful and may drive them to change body composition in a way that impairs both performance and health. Health professionals who obtain body composition data are reminded that this protected health information is confidential. In addition, health professionals should explain to each student-athlete that differences in height, age, gender and other factors are likely to result in differences in body composition, without necessarily resulting in differences in performance. Strategies to limit comparison include:

- Obtaining body composition values from only one student-athlete at a time, to limit the chance that the data will be shared.
- Reporting information on body composition using a range (+/- SEE) instead of a raw value.
- Helping athletes focus on how their data have changed between assessments.
- Increasing the focus on muscle mass and decreasing the focus on body fat.
- Using body composition values to help explain changes in objectively measured performance outcomes.

Seeking an Arbitrarily Low Level of Body Fat

Many student-athletes would like their body fat level to be as low as possible. However, they often try to seek a body fat level that is arbitrarily low, which can increase the frequency of illness, increase the risk of injury, lengthen the time to return to training after an injury, reduce performance and increase the risk of an eating disorder.[5] Importantly, body composition values should be thought of as numbers on a continuum that are usual for a sport, while also considering that each individual has a body composition range that will allow peak performance.

Understanding Optimal Body Composition

For each student-athlete, there may be a unique optimal body composition for performance, health and self-esteem. However, in most cases, these three values are not identical. Mental and physical health should not be sacrificed for performance. An erratic or missed menstrual cycle, sluggishness or an obsession with achieving a number on a scale may indicate that health is being challenged.

Assessing body composition can help student-athletes and coaches understand changes that are occurring from training and nutritional factors. However, the body composition measurement process and the values obtained can be sensitive issues for student-athletes. How these data are measured, shared and discussed increases the risk of having a potentially harmful discussion rather than one that supports overall performance goals. Body composition should be understood as one measurement among many other performance measures that all need to be considered simultaneously rather than independently. Body composition assessments should be done only for legitimate reasons, which should be communicated to student-athletes. Health professionals involved in obtaining body composition data should use the same technique with the same prediction equations to derive valid comparative data over time.

Everyone involved directly or indirectly with body composition measurement should understand that inappropriate measurement and use of these data might contribute to the student-athlete experiencing unhealthy emotional stress. This stress can lead to the development or enhancement of disordered eating in the student-athlete. (See **Guideline 3D: Low Energy Availability Syndromes in Athletics**.) Student-athletes identified as having signs and symptoms of disordered eating should be referred for evaluation and, if necessary, management of eating disorders and/or related mental health conditions (See **Guideline 6A: Mental Health Best Practices**.) Management of student-athletes with diagnosed eating disorders and/or related mental health conditions should consider the appropriateness of body composition testing and related body composition measure sharing.

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Guideline 3B

Dietary Supplements

Nutritional and dietary supplements are marketed to student-athletes and others to improve performance, recovery time, muscle-building capability and weight loss. Many student-athletes use nutritional supplements despite the lack of proof of their efficacy. In addition, such substances are expensive and may potentially be harmful to health, performance and/or eligibility. Unfortunately, most compounds obtained from specialty "nutrition" stores and mail-order businesses are not subject to the U.S. Food and Drug Administration safety regulations. As such, the **NCAA advocates a "food first" approach** to fueling athletic performance due to its proven efficacy and reduced risk of harm compared to supplementation.

▶ Administrative Considerations

Schools should provide accurate information to student-athletes regarding dietary supplements. Frequent education is recommended to increase understanding, rather than a once annually approach. Student-athletes should be educated that supplement use is at their own risk as impure supplements may lead to a positive drug test that could impact their eligibility.

Member schools should consider taking the following actions:

- Review of NCAA legislation, educational materials and interpretations for guidance on providing dietary supplements to student-athletes.
- Designation of an individual(s) as the athletics department's resource for questions related to NCAA-banned drugs or use of dietary supplements.
- Education of athletics department staff who interact regularly with student-athletes that:
  - The NCAA maintains a **list of banned drug classes** and provides examples of banned substances in each drug class.
  - Using any nutritional supplement may present risks to a student-athlete's health and eligibility.
  - Questions regarding NCAA-banned drugs or use of nutritional supplements should be referred to the school's designated resource individual(s).

Background

Often, athletes who turn to supplements to boost their performance do not realize they could accomplish this goal safely and effectively simply by ingesting adequate carbohydrates to support training. (See **Guideline 3C: Nutrition and Athletic Performance**.) General resources on nutrition and athletic performance,[1-3] and specific supplements such as caffeine,[4] amino acids,[5] sodium bicarbonate[6] and micronutrients[7] provide additional background information.

"Energy" Drinks

Student-athletes should be aware that nutritional supplements are not limited to pills, tablets and powders. Many "energy" drinks contain large amounts of either caffeine (e.g., 500 milligrams) or other stimulants, either of which can result in a positive drug test.

Student-athletes should be wary of drinks that promise an "energy boost" because they may contain banned stimulants. In addition, using stimulants while exercising can increase the risk of cardiovascular complications.

Drug Free Sport AXIS

The NCAA subscribes to Drug Free Sport AXIS for authoritative review of label ingredients in medications and nutritional/dietary supplements. NCAA member schools and their student-athletes and athletics personnel can contact AXIS at 816-474-7321 or **axis.drugfreesport.com** (access code is ncaa1, ncaa2, or ncaa3, depending on the school's divisional classification).

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Guideline 3C

Nutrition and Athletic Performance

Athletic performance and recovery from training are enhanced by attention to nutrient intake. Optimal nutrition for health and performance includes the identification of both the quantity and quality of food and fluids needed to support regular training and peak performance. As training demands shift during the year, student-athletes need to adjust their caloric intake and macronutrient distribution while maintaining a nutrient-dense diet that supports them in training and competition. The following key points summarize the recommendations of the American College of Sports Medicine, the Academy of Nutrition and Dietetics, and Dietitians of Canada regarding the impact of training on total energy and macronutrient, micronutrient and fluid recommendations for competitive student-athletes.[1]

Phases of Training

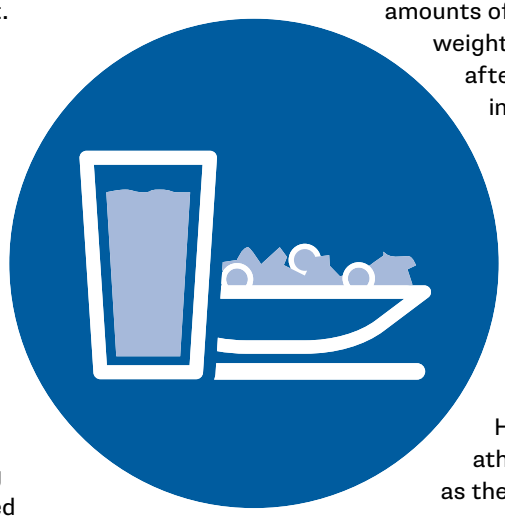
It is helpful to think of the collegiate athlete's training year as including three phases: **base training, competition** and **transition (recovery)**. During **base training**, when training volume is high (practices are longer and/or more frequent), athletes' energy needs are at their highest. A high-quality nutritional plan is key during this phase to support optimal adaptation to training, prevent under-nutrition and minimize the risk of illness and injury. Base training is also the best phase for the student-athlete to experiment with and define event fueling and hydration strategies that can be continued throughout the year.

The **competition** phase usually reflects a decrease in training volume, and perhaps high-intensity training sessions with extended periods of tapering leading up to competition and travel. During the competition phase, athletes should adjust calorie and macronutrient intake to prevent unwanted weight gain if their activity is decreased. For some, the competition phase can reflect a high training load depending on what position they play, the event in question and/or minutes played. They should learn how to eat before competition and while traveling, and how to adjust fluid needs based on environmental impacts. Athletes who consume a balanced diet will likely exhibit the best performance and experience less illness during the competition phase.

The **transition** (recovery) phase, during which athletes' training volume and intensity are at their lowest, requires some attention to nutrition to prevent unwanted changes in body weight and body composition (increased body fat or decreased muscle mass). This is the most appropriate phase in which to work on changes in body composition. During this phase, athletes may need to decrease total calorie intake while still maintaining a nutrient-dense diet.

Macronutrients

Carbohydrates, the primary fuel for higher-intensity activity, are required to replenish liver and muscle glycogen stores and to prevent low blood sugar (hypoglycemia) during training. Carbohydrate intake positively impacts adaptation to training and performance and can improve immune function.



Carbohydrate recommendations vary based on training, body mass and goals. Athletes with light training programs or skills-based training need 3-5 grams per kilogram of body weight per day. Moderate-intensity training of about 60 minutes per day requires 5-7 grams per kilogram of body weight per day. For moderate- to high-intensity endurance exercise lasting one to three hours per day, 6-10 grams of carbohydrate per kilogram of body weight is recommended.[2] As training intensity and/or volume increase to greater than four to five hours per day, carbohydrate need may easily exceed 10 grams of carbohydrates per kilogram of body weight. Athletes should begin to think about fueling for their next athletic activity immediately after the one they just completed. An athlete can maximize muscle glycogen replacement by consuming 0.75-1.5 grams of carbohydrate per kilogram of body weight.[2]

The U.S. Dietary Guidelines recommend that Americans focus their food choices on less-refined types of carbohydrates, as these contain essential micronutrients vital to health and performance. However, the current literature related to athletes shows that foods with a high glycemic index better restore glycogen within the first one to two hours after training.[3] Without these, it can be difficult for athletes to eat enough to achieve intakes greater than 10 grams per kilogram of body weight. In general, a high-carbohydrate diet consisting of a variety of foods (complex carbohydrates, fruits, vegetables, low-fat dairy, whole grains) is optimal for peak performance.

Protein requirements vary based on training volume as opposed to sport type. The body simply uses protein differently, such as to remodel or develop enhanced structural protein versus manufacturing more mitochondria, or red blood cells for improved aerobic capacity. The recommended amount of protein intake necessary to support metabolic adaptation, repair, remodeling and for protein turnover ranges from 1.2 to 2.0 grams per kilogram of body weight per day, but recent recommendations suggest regular spacing of modest amounts of high-quality protein (0.3 g/kg/body weight) is optimal throughout the day and after exercise. Recommendations also include ingesting a postexercise snack rich in carbohydrates with 0.25 to 0.3 grams per kilogram of high-quality protein containing all essential amino acids. Fortunately, the higher intakes recommended for athletes can be achieved in a well-balanced diet, but supplements and ready-to-drink products are convenient and often more realistic. However, vegetarian and vegan athletes may need to adapt their diets, as they need at least 10% more protein.

Fat is necessary for providing energy, is an essential element of cell membranes and supports the consumption of essential fatty acids and the absorption of fat-soluble vitamins necessary for optimal physiological immune function. Diets low in fat can negatively impact training, nutrient density of the diet and the ability to consistently improve performance. Monounsaturated fatty acids and polyunsaturated fatty acids are anti-inflammatory and can aid in the recovery process. During rest as well as prolonged lower-intensity training, fats are a major energy contributor and are stored in muscle as triglycerides for use during activity. Dietary fat intake should make up the gap between total calorie needs minus appropriate carbohydrate and protein needs. For most athletes, this will equate to a dietary fat intake of around 1.0 grams per kilogram, although intake may be as high as 2-3 grams per kilogram for endurance athletes with very high energy needs.

Micronutrients

In general, vitamin and mineral supplements are not required if a student-athlete is consuming adequate energy from a variety of foods to maintain body weight. The risk of micronutrient deficiencies is greatest in student-athletes who are restricting calories, engaging in rapid weight-loss practices or eliminating specific foods or food groups from their diet. Research shows that athletes have increased micronutrient needs. A multivitamin providing not more than 100% of the daily recommended intake can be considered for these student-athletes. (See **Guideline 3B: Dietary Supplements**.) Female student-athletes

are especially prone to calcium deficiencies due to inadequate intake to optimize peak bone mass and iron deficiencies from regular menstrual cycles. The dietary intake and iron status of endurance and vegetarian athletes (especially females) should be evaluated.

Hydration

Hydration status affects health and performance. Athletes should consume fluids throughout their day (e.g., water, low-fat milk, 100% fruit juices) and before, during and after training. It is recommended that athletes drink 0.5-1 ounces per pound of body weight each day to meet fluid needs. They should also include 20 ounces of rehydration fluids per pound of body weight lost through sweat.

Water is an appropriate beverage to meet fluid and hydration needs. Fluids containing electrolytes and carbohydrates are a good source of fuel and rehydration for exercise lasting longer than 60 minutes. Fluids marketed as energy drinks may contain questionable supplement ingredients and high levels of caffeine or other stimulants (e.g., 500 milligrams), which may cause increased heart rate, anxiety or gastrointestinal issues and affect eligibility of the competitive athlete. Caffeine consumption may be associated with mild fluid loss, but it does not negatively impact hydration status or thermoregulation.[4] (See **Guidelines 3H: NCAA Drug Testing and Substance Misuse Prevention** and **3B: Dietary Supplements**.)

Energy Intake and Availability

Adequate overall energy intake throughout the day is important for all student-athletes. Insufficient energy intake (due to skipped meals, dieting or unintentional underfueling) will have a rapid negative impact on training, recovery and performance. Inadequate energy intake increases fatigue; risks of dehydration, injury, gastrointestinal distress and depression; and can result in unwanted loss of muscle mass. It also decreases muscle glycogen stores and immune function. Insufficient caloric intake can lead to endocrine dysfunction and decreased bone mineral density in all genders. (See **Guideline 3D: Low Energy Availability Syndromes in Athletics**.)

Student-athletes in certain sports can face a difficult paradox in their training/nutrition regimens, particularly those competing in “weight class” sports (e.g., wrestling); sports that favor those with lower body weight (e.g., distance running, gymnastics); sports requiring student-athletes to wear body contour-revealing clothing (e.g., track, diving, swimming, volleyball); and sports with subjective judging related to “aesthetics” (e.g., gymnastics, diving). These student-athletes are encouraged to eat to provide the necessary fuel for performance, yet they often face self- or coach-imposed weight pressure. Low body weight or low body fat may benefit performance only if the habits necessary to achieve and maintain it are genetically realistic for the individual, if calorie intake is reasonable and if the diet is nutritionally balanced.

A more prevalent issue is the large number of subclinically disordered or chronically dieting athletes. Department-wide efforts to educate staff and student-athletes should address the negative impacts of underfueling and weight/food preoccupation on student-athletes' performance and overall well-being. Although disordered eating is more prevalent in women, it also occurs in men and is believed to be underreported. The **NCAA Student-Athlete Health and Wellness Study** conducted in the 2022-23 school year revealed that 45% of women's sports participants were trying to lose weight compared to 13% of men's sports participants. Warning signs for disordered eating that warrant follow-up include the following: preoccupation with weight, rapid changes in body weight, avoiding eating with others, over-focus on body shape and food, and, in female athletes, three or more missed menstrual cycles in a year (not due to contraceptives). The medical examination and updated health history is an opportunity to assess student-athletes for these risk factors and refer them to appropriate professionals for further evaluation and diagnosis.

Disordered eating is often an expression of underlying emotional distress that may have developed long before involvement in athletics. Disordered eating can be triggered in psychologically vulnerable individuals by a single event or comments (such as offhand remarks about appearance, or constant badgering about a student-athlete's body weight, body composition or body type) from a person important to the individual. Coaches, athletic trainers, sport dietitians and supervising physicians must be watchful for student-athletes at higher risk for eating disorders. Disordered eating can lead to dehydration, loss of muscular strength and endurance, decreased aerobic and anaerobic power, loss of coordination, impaired judgment and other complications that decrease performance and impair health. These symptoms may be readily apparent or may not be evident for an extended period. Many student-athletes have performed successfully while having an eating disorder. Therefore, diagnosis of this physical and mental health condition should not be based entirely on decreased athletic performance.

Body Composition

Body composition and body weight can affect exercise performance but should not be used as the main criteria for participation in sports. Schools should have a protocol in place outlining the rationale for body weight and body composition measurements, who is allowed to measure student-athletes, who is permitted to discuss results with student-athletes and what frequency of measurement is appropriate. For each student-athlete, there may be a unique optimal body composition for performance, health and self-esteem — but in most cases, these three values are not identical. Mental and physical health should not be sacrificed for performance. An erratic or lost menstrual cycle, sluggishness or an obsession with achieving a number on a scale may be signs that a student-athlete's health is being challenged. (See **Guideline 3A: Assessment of Body Composition**.)

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Guideline 3D

Low Energy Availability Syndromes in Athletics

Energy availability is defined as dietary energy intake available for physiologic function after accounting for the energy cost of exercise. In athletes, low energy availability triggers energy-conserving adaptations, which, when mild, do not have negative health consequences. However, when low energy availability is chronic or severe, the metabolic and hormonal changes that occur to conserve energy may have deleterious health and performance effects.[1]

The most well-studied low energy availability syndromes are the Female Athlete and Male Athlete Triads, with the triad referring to low energy availability, altered reproductive hormones and low bone mineral density.

Certain health conditions, like eating disorders, are associated with pathologic low energy availability. The Relative Energy Deficiency in Sports (REDs) conceptual model builds on evidence demonstrating a causal relationship between low energy availability and altered endocrine function as described by the Triads, to include the possibility of immune, gastrointestinal and cardiovascular dysfunction.[2] Essentially, REDs is a syndrome that is the eventual consequence of prolonged or severe low energy availability.[3] However, conceptual ambiguity and a limited evidence base are an ongoing challenge for the clinical application of REDs.[2]

▶ Administrative Considerations

Schools should consider developing written policies and procedures to guide the screening, diagnosis, treatment and participation decisions for student-athletes with low energy syndromes and the possible and related health conditions associated with these syndromes. Such policies and procedures may be informed by several recent consensus and position statements that address these and related conditions.[4-6]

Policies and procedures should aim to facilitate early identification and treatment of low energy availability conditions. This is important to prevent deterioration to: 1) low energy availability resulting from a clinical eating disorder, as defined by the American Psychiatric Association (e.g., anorexia nervosa);[7] 2) hypothalamic amenorrhea; and 3) osteoporosis. Patient management procedures should also prioritize the maintenance of student-athlete confidentiality given the sensitivity of the relevant topics, including disordered eating and menstrual/sexual health.[1]

Established policies and procedures are important for contributing to consistency in screening, diagnosis and treatment processes. Student-athletes may feel they are being treated unfairly if they perceive inconsistencies about who is withheld from participation, for example, and evidence suggests that the student-athlete's honesty and willingness to engage in appropriate care is essential for effective screening, evaluation, diagnosis and treatment.

In addition, schools should consider providing education on low energy availability syndromes for everyone who interacts with student-athletes, such that athletics staff are able to recognize obvious signs and symptoms. If knowledge regarding these syndromes is limited to sports medicine professionals, they can go underrecognized, especially in males.[8] Health care providers should consider low energy availability when a student-athlete exhibits a component of the Triad or other persistent health concerns with no other obvious etiology.

Complementary policies and procedures related to body weight/composition assessment, provision of nutrition education/dietary advice and assessment of dietary intake should also be developed to reduce risk of disordered eating/low energy availability syndromes. (See **Guideline 3A: Assessment of Body Composition**.)

Schools should emphasize the importance of interdisciplinary care in the identification and management of student-athletes with low energy availability syndromes in their relevant policies. If the student-athlete has a positive screen for disordered eating, it is highly recommended that an integrated health care team participate in evaluation and diagnosis.[9] Typically, the integrated health care team would include a physician, a registered dietitian (preferably a board-certified specialist in sports dietetics), an athletic trainer and a mental health professional.

Background

Low Energy Availability Syndromes: Female Athlete and Male Athlete Triad

As noted above, the most well-studied low energy availability syndromes are the Female Athlete and Male Athlete Triads. In female student-athletes, the triad refers to 1) low energy availability, with or without disordered eating; 2) menstrual cycle disturbances; and 3) low bone mineral density. In male athletes, the triad consists of three interrelated conditions that, like the Female Athlete Triad, exist on a continuum: 1) energy deficiency/low energy availability; 2) suppression of the hypothalamic-pituitary-gonadal (HPG) axis; and, 3) impaired bone health. There are specific diagnostic criteria for both the Female Athlete and Male Athlete Triads.[4,6]

The reported prevalence of disordered eating, which is often associated with low energy availability, is high in athletes participating in sports that emphasize leanness (e.g., distance running), aesthetic sports (e.g., gymnastics, diving) or weight-class sports (e.g., wrestling).[10] An estimated 25% of males in high-risk sports exhibit disordered eating, while nearly 50% of female athletes in high-risk sports and 75% of female distance runners exhibit disordered eating. Among elite cross-country runners, 80% of females and 54% of males were at risk for low energy availability.[11]

When low energy availability is chronic or severe, the metabolic and hormonal changes that occur to conserve energy may have deleterious health and performance effects.

Recommended Screening Questions

Female Athlete Triad[1]

- Have you ever had a menstrual period?
- How old were you when you had your first menstrual period?
- When was your most recent menstrual period?
- How many periods have you had in the past 12 months?
- Are you presently taking any female hormones (estrogen, progesterone, birth control pills)?
- Do you worry about your weight?
- Are you trying to or has anyone recommended that you gain or lose weight?
- Are you on a special diet or do you avoid certain types of foods or food groups?
- Have you ever had an eating disorder?
- Have you ever had a stress fracture?
- Have you ever been told you have low bone density (osteopenia or osteoporosis)?

Male Athlete Triad[4]

- Do you worry about your weight?
- Are you trying or has anyone recommended that you lose or gain weight?
- Are you on a special diet, or do you avoid certain types of foods or food groups?
- Have you ever had an eating disorder?
- Have you ever had a stress fracture?
- Have you ever been told that you have low bone density or osteoporosis?
- Have you ever been diagnosed with low testosterone levels?*
- Do you have low libido (sex drive)?*
- Do you have morning erections?*
- Do you need to shave your facial hair less frequently?*

**Recommend inclusion only on preparticipation physical examinations for postpubertal athletes.*

Identification of student-athletes with the Triad can be challenging for several reasons. Female student-athletes may not view loss of menses, which is a common clinical sign, as problematic. And even if they are aware of long-term health risks, they may be reluctant to make lifestyle changes because of the perceived performance benefits associated with low body weight. The likelihood of the Male Athlete Triad going undiagnosed is particularly high because, unlike females, there is no overt clinical sign of the reduced testosterone secretion that accompanies the Male Triad, other than a possible reduction in libido.[12] In addition, disordered eating or clinical eating disorders are often overlooked in males.

Ideally, according to the NCAA's **Mental Health Best Practices**, schools should screen annually for the triad using validated instruments. The box above lists recommended screening questions for male athletes and female athletes. If one component of the Triad is present, then the student-athlete should be screened for other components.

Low Energy Availability Syndromes: Relative Energy Deficiency in Sport

The Relative Energy Deficiency in Sport (REDs) conceptual model was developed to enhance and expand what is known about energy deficiency in athletes, especially the female athlete triad.[2] REDs is defined as "impaired physiological functioning caused by relative energy deficiency and includes, but is not limited to, impairments of metabolic rate, menstrual function, bone health, immunity, protein synthesis and cardiovascular health."[5]

The REDs model has preliminary supportive evidence but has yet to be rigorously tested.[2, 13] Establishing diagnostic criteria is a next step. Currently, a diagnosis of REDs is made via exclusion and based only on symptoms. Researchers have not yet established the biological mechanisms by which low energy availability affects the health and performance outcomes included in the corresponding conceptual models, and the effects may be indirect and/or moderated by other factors.[5] In addition, some negative performance/health effects attributed to

low energy availability in the REDs model might be caused by overtraining; consequently, REDs can be misidentified as overtraining syndrome.

Significance of Low Energy Availability Syndromes for Athletes

Low energy availability is a significant concern for student-athletes for three reasons: 1) its negative and possibly irreversible impacts on reproductive and bone health; 2) possible additional health and performance negative impacts; and 3) its high prevalence among athletes, especially those in endurance and weight-class sports. When the energy available for normal physiologic function is insufficient (i.e., low energy availability), the body downregulates energy-consuming processes, such as reproduction, metabolic rate and bone metabolism. In addition, energy reserves, such as body fat and ultimately protein in lean tissue, are mobilized.

While the full impact of low energy availability on male student-athletes is still unknown, the existing data suggest it is a relevant health consideration. While the metabolic and reproductive disturbances observed in men appear to recover more quickly following a reduction in exercise or an increased caloric intake than in women, deficits may persist. These deficits may impact peak bone mass for college-aged men, which is a primary determinant of low bone mass later in life.[15]

Participation Considerations

The Female Athlete Triad Coalition Consensus Statement provides a medical risk stratification protocol based on severity of each Triad component, which is translated into guidelines to assist the team physician in participation decisions.[1] In addition, the team physician should consider the student-athlete's unique situation and risk factors, such as sport and level of competition. Student-athletes who are classified as moderate- or high-risk should complete a written treatment contract that clearly specifies the criteria for ongoing and future clearance and return-to-play. The Consensus Statement also recommends that student-athletes diagnosed with anorexia nervosa who have a BMI <16.5 kg/m^2 or with moderate to severe bingeing/purging (>4 times/week) should be restricted from training and competition. Future participation depends on treatment of the eating disorder(s), including achieving a BMI >18.5 kg/m^2, and cessation of bingeing and purging. These student-athletes should be closely followed at regular intervals by the integrated health care team.[1]

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Guideline 3E

Sleep and Recovery

Sleep plays an important role in health and well-being, as well as academic and athletic performance. Collegiate student-athletes have unique challenges in obtaining adequate sleep, both in sleep duration and sleep quality. In 2017, the **NCAA Committee on Competitive Safeguards and Medical Aspects of Sports** and the NCAA Sport Science Institute convened an **Interassociation Task Force on Sleep and Wellness**, examining the science of sleep as it relates to well-being, performance and recovery. The consensus recommendations for sleep in collegiate athletes[1] and an accompanying **one-page educational document** were published in 2019 as an outcome of the taskforce.

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Guideline 3F

Preseason Injury Prevention: Strength and Conditioning

Preseason is a critical period for athletics staff to instill team culture, integrate new players and prepare student-athletes for the upcoming season. This period is often marked by significant increases in both training volume and intensity, which makes it imperative that sound strength and conditioning principles are followed to minimize injury risk and optimize physical readiness. The demands of this period can be further compounded for fall sports due to legislated limits on both the length of the preseason and permitted athletic activity during the summer. Often, schools ask student-athletes to take personal responsibility for preparing themselves physically at least four to six weeks before the preseason.[1] Increased workload and reduced recovery coupled with other stressors inherent to student-athletes mean that the preseason is the period with the highest practice injury rates and physiologic disruption.[1-3] These factors may jeopardize success throughout the season if not properly managed.

Administrative Considerations

Schools should establish, enact and regularly review policies pertaining to preseason preparation to reduce injury risk and optimize athlete and team readiness. The length of preseason for fall sports may require additional consideration. To address these issues, schools should follow NCAA legislation (e.g., football acclimatization period, mandatory medical evaluation, sickle cell solubility test results) and consider how to implement the **Interassociation Recommendations: Preventing Catastrophic Injury and Death in Collegiate Athletes**. This document is an Association-wide policy and addresses emergency action plans, transition and acclimatization periods, expectations around strength and conditioning activities and more.

Background

Preseason Preparation

It is commonly accepted that student-athletes should participate in at least six to eight weeks of preseason strength and conditioning.[4] This preparation should emphasize gradual progression of type, frequency, intensity, recovery and duration of training. In addition, where applicable, preseason training should be long enough to allow for gradual heat acclimatization. (See **Guideline 4B: Exertional Heat Illness**.) Athletes and coaches alike should understand that preseason is not the time to "get themselves into shape" for their sport. The fittest athletes can incur the greatest physiologic disruption in preseason due to the increased workload they accumulated to make up for the less fit athletes.[1] Therefore, a high level of fitness entering preseason could be a benefit for the entire team by minimizing the risk of overreaching or overtraining.[1]

The combined preparatory and preseason phases provide sufficient time to improve fitness and skill; however, performing novel exercise or actively doing too much too soon can result in a disparity between workload and load tolerance, thus increasing risk for injury or harming season-long readiness.[3] In addition, a student-athlete's psychological well-being can directly depend on the level of fatigue driven by volume (quantity) and intensity of training, with cumulative effects throughout the season.[5] Similarly, the incidence of stress-related injuries (e.g., stress fractures, tendinopathies) can be proportional to the work-rest ratio of the athlete.

Effective Preseason Programming

To establish an effective strength and conditioning training plan for preseason, it is useful to have a fundamental understanding of essential strength and conditioning concepts. Appropriately structured sessions can induce physiologic adaptations that enhance capacity and resilience and reduce the risk of injury. The combination of strength, speed, power, cardiorespiratory fitness and other physiologic components of athletic capacity can complement skill and enhance performance for all athletes.

A multidisciplinary applied sport science approach to developing athletic performance — when strength and conditioning specialists, athletic trainers, physicians, dietitians, sport coaches, sport psychologists and exercise physiologists work together — provides the best foundation for success. This approach creates a sound and effective sport training program based on scientific principles intended to produce sport-specific adaptations and outcomes while accounting for any potential health limitations and builds a foundation for long-term athlete development and sustained performance.[6]

Principles of Program Design

The school's performance staff should endeavor to design strength and conditioning sessions to optimize the performance of the athlete and minimize the risk of injury and illness. Appropriate strength training helps protect joints, ligaments, tendons and muscles from injury, while sport-specific skill training can help

A well-designed strength and conditioning program — along with appropriate, sport-specific skill development, adequate rest and recovery, sufficient sleep and proper nutrition — are the best approaches to preventing injury.

prevent injury by improving the athlete's proprioception. It is important to remember that athletes returning to athletic activity from a detrained state and/or those experiencing significant stress are at a high risk of injury.

Six program design principles should be considered by the performance staff when designing any exercise program:[7-9]

- **Specificity:** Training adaptations are specific to the stimulus applied.
- **Overload:** To achieve adaptation, the body must be stressed against a stimulus or load greater than which it is accustomed to.
- **Progression:** Training stimulus must gradually but systematically increase to challenge the system and a properly periodized training plan must consider the phase of training or competition as training priorities change throughout the year. Appropriate periodization allows the athlete to peak for competition and improve over time.
- **Individual Variability:** Recognizes that every student-athlete is unique and will respond differently to the same training stimulus.
- **Diminishing Returns:** Performance gains are related to the level of training experience of the individual.
- **Reversibility/Detraining:** Decrease in performance is directly related to the degree of reduction in training.

Understanding these principles will help the student-athlete, sport coach, and strength and conditioning coach set realistic goals and develop training programs that will provide the greatest opportunity to achieve performance gains. It is the responsibility of the strength and conditioning coach, in concert with the sport coach, to thoroughly evaluate the level of strength and conditioning of all new and returning student-athletes and to properly prescribe the appropriate training volume, load and intensity.

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Guideline 3G

Weight Loss and Dehydration

Health, safety and performance can be severely compromised if student-athletes attempt to reduce their body weight without proper education and support from their athletics health care team. Weight loss, accomplished through restricted food intake or dehydration, may cause significant impact to both mental and physical health.

▶ Administrative Considerations

Institutions should develop policies and procedures that include the following:

- A plan to educate student-athletes and coaches about weight loss, including safe strategies and the physiologic and pathologic impact of hazardous strategies.
- The use of reliable and accurate evidence-based methods to identify minimum body weight for competition.
- Strategies and guidance on interpreting the minimum body weight and safe weight reduction when warranted, based on minimum weight assessment.

Background

Two general routes to weight loss exist: loss of body water or loss of energy mass (carbohydrate or glycogen, fat and lean tissue). The process of losing body water without replacement, called dehydration, leads to a state of negative water balance called hypohydration.[1] It is accomplished by withholding fluids and carbohydrates, promoting extensive sweating, loading with water to stimulate excess urine production, and less often, using emetics, diuretics or laxatives.[2,3] Significant weight loss can be achieved relatively quickly via dehydration. The reduction of energy mass necessitates creating an energy deficit (burning more calories than one consumes) and requires more time and requires more time for appreciable weight reduction with body fat being the main target. Both processes are most evident in those who must be certified to participate in a given weight class but can also be present in other sports.

In the case of weight-class sports, dehydration and energy deficits can impair performance and imperil health. Intentional dehydration can lead to a variety of adverse physiologic effects, including significant pathology and even death.[4] Dehydration in excess of 3% to 5% of body weight can lead to reduced strength and muscular endurance; impaired cardiovascular endurance due to reduced plasma and blood volume; compromised cardiac output (elevated heart rate, smaller stroke volume); impaired thermoregulation; decreased kidney blood flow

and filtration; reduced muscle and liver glycogen stores; and loss of electrolytes.[3,5] Pathologic responses include heat stroke, rhabdomyolysis, kidney failure and cardiac arrest.[6] Reduced food intake depletes muscle and liver glycogen stores, stimulates lean mass loss along with body fat reduction and can promote nutrient deficiencies that have longer-term consequences, such as a negative impact on bone health. (See **Guideline 3D: Low Energy Availability Syndromes**.)

Following extensive dehydration and restricted food intake, attempts at acute rehydration and recovery usually are insufficient for body fluid, electrolyte and energy homeostasis to be restored completely during brief periods before competition.[1] In wrestling, this is especially true between the official weigh-in and actual competition.

All respected sports medicine authorities and organizations have condemned the practice of drastic weight reduction through dehydration and deprived food intake.[3,7,8] To promote sound practices, schools should educate student-athletes and coaches about the physiologic and pathologic consequences of excessive food and fluid restriction. These education programs should also strongly discourage potentially harmful practices including the use of weight loss products such as laxatives, emetics and diuretics, self-induced vomiting, vapor-impermeable suits and the use of saunas or other hot rooms. Section 5 of the **wrestling rules** includes specific prohibitions on these actions.

Dehydration is a potential health hazard that acts with poor nutrition and intense exercise to compromise health and athletic performance. The sensible alternative to dehydration weight loss involves preseason determination of an acceptable (minimum) competitive weight based on body composition assessment, followed by gradual weight loss to achieve the competitive weight, and maintenance of the weight during the competitive season. (See **Guideline 3A: Assessment of Body Composition**.) This guidance is captured in the **rules for wrestling** weight classifications. Valid and population-specific body composition procedures should be used to determine the appropriate competitive weight for males and females. Based on prior recommendations,[9] minimum body fat for males is 5% and for females, 12%, although a call has been issued to reevaluate the latter.[10] Spot checks (body composition or dehydration) should be used to ensure compliance with the weight standard during the season. Gradual weight loss, i.e., 1 to 2 pounds per week, to maximize fat reduction and preserve protein requires increased training and/or reasonable reduction in caloric intake while still meeting daily nutrient needs. Seeking guidance from the school's sports medicine staff for appropriate diet plans is highly encouraged.[1]

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Guideline 3H

NCAA Drug Testing and Substance Misuse Prevention

In 1986, the NCAA established its drug-testing program to help member schools protect competing student-athletes. The purpose of the drug-testing program is to deter student-athletes from using performance-enhancing drugs and affirm the ideal of fair and equitable competition. All NCAA member schools are required to participate in the mandatory drug-testing program, which occurs year-round (DI and DII) and during championships (all divisions). Member schools are required to provide drug education for all student-athletes, which must include information on the risks of using nutritional/dietary supplements. (See **Guideline 3B: Dietary Supplements**.) The NCAA maintains a current **list of banned drug classes** and provides examples of banned substances in each drug class.

Recognizing there may be legitimate medical purposes for the use of some banned substances, the drug-testing program allows for **medical exceptions** and has established protocols schools must follow when submitting a request on behalf of a student-athlete. Student-athletes who test positive for a banned substance have the right to appeal the finding.

The **NCAA Drug-Testing Manual** includes Information pertaining to the NCAA drug-testing program, recommendations for a drug education framework and institutional drug testing, NCAA drug-testing procedures and the medical exception and appeal processes. Additional information, including reporting forms, is **here**.

Developing and maintaining a successful drug education program requires engagement from athletics administrators, coaches and sports medicine personnel and involves campus colleagues for additional support. The NCAA Drug-Testing Program provides a framework for member schools to assure they are conducting adequate drug education for all student-athletes. Broader guidance and strategies for creating a "culture of prevention" are provided in **Substance Misuse Prevention and Intervention: An Athletics Tool Kit**, which supports member schools in their efforts to reduce student-athlete substance misuse and promote healthy choices.

NCAA research provides helpful insight into the use of substances, including drugs and alcohol, by student-athletes. The recently developed comprehensive **NCAA Student-Athlete Health and Wellness Study** conducted in 2022-23 subsumes many of the survey items from the **NCAA Student-Athlete Substance Use Study** which examined patterns of drug and alcohol use back to 2009. (See table.)

Patterns of Ergogenic and Social Drug Use in Student-Athletes

	2009		2013		2017		2023	
	Women's Sports	Men's Sports	Women's Sports	Men's Sports	Women's Sports	Men's Sports	Women's Sports	Men's Sports
Patterns of Ergogenic Drug Use*								
Amphetamines	3.3%	4.0%	3.5%	5.3%	0.7%	2.1%	0.5%	1.0%
Anabolic Steroids	0.2%	0.5%	0.1%	0.7%	0.1%	0.6%	--	--
Anabolic agents or related metabolic modulators (e.g., HGH, testosterone)	--	--	--	--	--	--	0.1%	0.7%
Patterns of Social Drug Use*								
Alcohol	83.1%	83.1%	81.3%	79.9%	78.5%	76.2%	76.3%	68.4%
Cigarettes	13.5%	16.8%	6.3%	12.7%	5.3%	14.0%	6.9%	11.5%
Cocaine	1.0%	2.3%	0.6%	2.6%	1.7%	5.2%	0.6%	2.3%
Marijuana	18.4%	25.3%	17.0%	25.0%	22.3%	26.3%	24.9%	26.6%
Narcotics (without a prescription)	3.2%	6.3%	4.8%	6.5%	2.3%	3.3%	1.7%	1.7%
Spit Tobacco	2.4%	27.2%	1.5%	24.2%	0.6%	21.8%	1.7%	15.4%
Synthetic Marijuana	–	–	0.7%	2.1%	0.5%	0.8%	5.8%	7.9%
Vaping Nicotine / e-cigarette	--	--	--	--	3.6%	11.4%	21.0%	23.0%

SECTION 4

Prevention of Catastrophic Injury and Death

Guideline 4A

Preventing Catastrophic Injury and Death in College Athletes

In 2016, and in partnership with the College Athletic Trainers' Society, the NCAA conducted the second Safety in College Football Summit. The event, attended by athletic trainers, physicians, concussion researchers, university administrators, football coaches and representatives from leading sports medicine organizations, was designed to update the three consensus-driven guidelines developed during the first Safety in College Football Summit held in 2014.

A new topic identified at the second summit for which consensus guidance was sought was the prevention of catastrophic sport-related injury and death in collegiate student-athletes. Overall, football has the highest number of both traumatic and nontraumatic catastrophic injuries of any collegiate sport. Since 1931, the first year in which football-specific fatality data were collected, there have been 96 traumatic fatalities in college football and 140 nontraumatic fatalities.[1] In response, and as a product of discussions among medical and scientific experts representing various industry medical organizations related to the prevention of catastrophic injury and death in collegiate athletes, the document, **Interassociation Recommendations: Preventing Catastrophic Injury and Death in Collegiate Athletes**, was developed.

The recommendations in the main document have been endorsed by 13 external scientific and medical organizations and illuminate areas of consensus about the best ways to prevent catastrophic injury and death in collegiate athletes. They provide a flexible roadmap for NCAA member institutions to address catastrophic injury prevention in six key areas: sportsmanship, protective equipment, acclimatization and conditioning, emergency action plans, strength and conditioning personnel and education and training.

In addition to the main document, the **FAQ document** was developed to assist with questions about the new policy. This document addresses issues about the process by which the policy was developed, reviewed and endorsed, including the use of foundational statements as a basis. In addition, it addresses questions that have emerged from the membership regarding the interpretation and implementation of the recommendations in the main document. Lastly, the **checklist** in the recommendations will help athletics health care administrators to ensure that policies are established, followed and consistent with the recommendations.

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Guideline 4B

Exertional Heat Illness

Exertional heat illness results from an elevation in core body temperature that occurs when the heat generated from exercise cannot be adequately dissipated through physiologic cooling mechanisms. Exertional heat illnesses range in severity from exercise-associated muscle cramps to exertional heat stroke, a true medical emergency that can lead to permanent organ failure and death.[1,2]

Data from the NCAA Injury Surveillance program reveals that football has the highest incidence of exertional heat illnesses but also that exertional heat illness occurs in almost all NCAA sports.[3] Most cases of exertional heat illness occur during preseason training and in states with the hottest average temperatures.[3]

Exertional heat illness is largely preventable with appropriate training guidelines, education, environmental monitoring, modification of activity as warranted by environmental conditions, and identification of individuals who may be at higher risk. Schools should have a plan for prompt diagnosis and prehospital treatment of exertional heat stroke.

▶ Administrative Considerations

Schools should create and implement policies and procedures that address prevention and management of exertional heat illness, including the establishment and maintenance of venue-specific and well-rehearsed emergency action plans. (See **Guideline 1K: Emergency Action Plans**.) The document **Preventing Catastrophic Injury and Death in Student-Athletes**, which is Association-wide policy, includes a checklist that can inform these policies and procedures.

Background

The table describes various types of exertional heat illnesses that are associated with athletic activity. Notably, exertional heat illnesses exist on a spectrum and can have overlapping signs and symptoms.

Clinical Distinctions of Exertional Heat Illness

	Exercise-Associated Muscle (Heat) Cramps	Heat Syncope	Heat Exhaustion	Exertional Heat Stroke
Description	Acute, painful, involuntary muscle contractions presenting during or after exercise.	Collapsing in the heat, resulting in loss of consciousness.	Inability to continue exercise due to cardiovascular insufficiency.	Severe hyperthermia leading to overwhelming of the thermoregulatory system.
Physiologic cause	Dehydration, electrolyte imbalances, and/or neuromuscular fatigue.	Standing erect in a hot environment, causing postural pooling of blood in the legs.	High skin blood flow, heavy sweating, and/or dehydration, causing reduced venous return.	High metabolic heat production and/or reduced heat dissipation.
Recovery	Often occurs within minutes to hours.	Often occurs within hours.	Often occurs within 24 h; same-day return to play not advised.	Highly dependent on initial care and treatment; further medical testing and physician clearance required before return to activity.

Table. Clinical Distinctions of Exertional Heat Illnesses. Adapted from Casa DJ, DeMartini JK, Bergeron MF, et al. National Athletic Trainers' Association position statement: exertional heat illnesses. J Athl Train. Sep 2015;50(9):986-1000. Reprinted with permission.

Prevention of Exertional Heat Illness

The National Athletic Trainers' Association and the American College of Sports Medicine have developed best-practice recommendations for the prevention of exertional heat illnesses.[4,5] The guidance addresses key prevention strategies, including but not limited to:

- Medical history and physical evaluation.
- Identification of risk factors (e.g., pressure to perform, nutrition, medical conditions).
- Heat acclimatization.
- Monitoring environmental conditions.
- Adjustment of practice and competition schedules, including appropriate recovery.
- Clothing and equipment choices.
- Adequate hydration.
- Never using physical activity as punishment.

Education is a cornerstone of prevention. Schools should have a plan to educate strength and conditioning coaches, sport coaches, student-athletes and those involved in the health care of student-athletes to use universal training precautions and recognize the signs and symptoms of exertional heat illnesses.[6] Education should also note that rectal thermometry is used to diagnose exertional heat stroke.

Identification and Management of Exertional Heat Stroke

The signs and symptoms associated with exertional heat stroke mimic those of other medical emergencies (e.g., sudden cardiac arrest, sports related concussion, exercise-associated hyponatremia, hypoglycemia, hypothermia, exercise-associated postural hypotension). Because of this, a rapid and accurate differential diagnosis is important.[5]

Core body temperature is key to accurate assessment of exertional heat illness. Rectal temperature is the gold standard for measurement of core body temperature because of its accuracy.[7] A flexible rectal thermometer can remain in place during cold water immersion. The accuracy of other methods (e.g., oral, aural, forehead) is not adequate, and experts do not recommend their use in such situations.[5] Athletics health care providers should be proficient in rectal temperature measurement.

The first line treatment for exertional heat stroke is whole-body cold-water immersion. Athletic health care providers should be practiced in whole-body cooling protocols, and such protocols should be part of venue- and condition-specific emergency action plans. (See **Guideline 1K: Emergency Action Plans**.) The goal of cold-water immersion is to bring the core body temperature to below 40.0° C within 30 minutes.[7] Alternative cooling strategies exist if cold-water immersion is not available or possible; however, these are associated with slower cooling rates.[5]

Medical transport to the emergency department should occur only after core temperature cooling goals have been satisfied. If possible, health care providers should select transportation options with the capacity for continued cooling en route.

Return to Participation Following Exertional Heat Illness

The goal of the return-to-activity plan is to safely achieve full recovery of the student-athlete's capacity prior to their exertional heat illness. The American College of Sports Medicine provides detailed guidance on progressive return of student-athletes from exertional heat illnesses.[5]

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Guideline 4C

Exertional Rhabdomyolysis

Exertional rhabdomyolysis (ER) is a pathophysiological process in which skeletal muscle cell damage occurs because of overexertion during physical activity. Most frequently, ER occurs in association with high-intensity, prolonged or novel exercise; exercise involving eccentric muscle contractions; or normal exercise under extreme environmental conditions. ER is an acute and potentially life-threatening clinical syndrome.

ER has been reported in various populations. Among ER cases presenting to emergency departments between 2000 and 2019, football was responsible for 43.9% of all sport-related cases.[3]

An algorithm for diagnosis and treatment of ER provides needed background information.[1] Individuals involved in directing or supporting student-athlete physical activity (e.g., strength and conditioning coaches) should also be knowledgeable regarding symptoms and risk factors for this condition.

Administrative Considerations

Schools should have policies and procedures regarding the following:

- Education of coaches, student-athletes and staff regarding risk factors for and symptoms of ER.
- Recognition and response to risk factors for exertional rhabdomyolysis among student-athletes.
- Recognition of transition and acclimatization periods and the application of appropriate training progressions during preseason or following periods of inactivity.
- Rapid recognition and treatment of ER.
- A well-rehearsed site-specific emergency action plan that ensures immediate transport to a hospital emergency department for clinical evaluation when ER is suspected.
- Return-to-play for student-athletes who experience ER.

Background

Risk factors for exertional rhabdomyolysis

ER in NCAA student-athletes is commonly linked to three conditions: novel overexertion, exertional heatstroke and exertional collapse with complications in athletes with sickle cell trait. Each of these conditions can be mitigated by understanding the following ER risk factors:

Individual risk factors. Student-athletes who are driven to overexertion to meet their personal goals or expectations of others are at increased risk for ER. Student-athletes who are male, Black, poorly conditioned or have sickle cell trait or genetic metabolic myopathy are also at increased risk.

Nutritional supplements, medications and illicit substances. Dietary supplements containing stimulants have been associated with severe ER. The risk of ER is increased with alcohol; drugs of misuse (especially opiates, amphetamines, cocaine and other stimulants); and medications, including non-steroidal anti-inflammatory drugs.[1,2]

Exercise mode, volume, intensity. Novel overexertion is the single most common cause of ER and is characterized as "too much [of a novel exercise], too soon and too fast." Novel exertion occurs in trained individuals who markedly increase their training volume, train a different muscle group or perform exercise that elicits eccentric muscle contractions (when a muscle contracts as it lengthens). Examples of activities that elicit eccentric contractions include downhill running, squats, push-ups and plyometrics. Untrained or detrained individuals are especially susceptible to overexertion during the start of an exercise training program when a coach encourages athletes to "push themselves."

Inappropriate workouts. Excessively intense workouts designed and conducted by coaches and/or strength and conditioning personnel are a common factor in team outbreaks of ER.[4] Examples of problematic workouts include increasing the number of exercise sets and reducing the time needed to finish (e.g., 100 squats, timed runs, station drills). ER has also occurred within a team when the coach uses an inappropriate workout as punishment for poor performance or perceived lack of effort.

Environmental conditions and hydration status. High heat and humidity interfere with body temperature regulation and cause dehydration, which increases the risk of ER. Dehydration is itself a risk factor for severe ER. Reduced hydration impairs the filtering and waste-clearing ability of the kidneys, which increases the risk of renal failure. Dehydration also impairs the regulation of body temperature, which combined with high heat and humidity also increases the risk of exertional heat stroke. (See **Guidelines 4B: Exertional Heat Illness** and **3G: Weight Loss and Dehydration**.)

Clinical Considerations for Exertional Rhabdomyolysis

ER can range from mild to severe. Clinical signs are often vague: muscle pain, soreness and stiffness. In severe cases, symptoms can include weakness, loss of mobility and swollen, tender muscles. Mild, or "physiologic," ER is a response to training that is necessary for exercise adaptation to occur. Athletes with physiologic ER may be asymptomatic or experience only mild muscular symptoms generally ignored by the athlete. Therefore, mild ER can be detected only by an elevation in serum creatine kinase – a condition sometimes called hyperCKemia. Delayed

onset muscle soreness (DOMS) is another mild form of ER, which occurs in the first few days after unaccustomed, moderately strenuous exercise and is associated with muscle soreness and stiffness. DOMS is rarely a clinical problem and tends to be self-limited with only relative rest or a reduction in training.

Unlike hyperCKemia or DOMS, severe ER is a major health concern. Acute kidney failure occurs in 15% to 50% of ER cases, with acute cardiac arrest and compartment syndrome also prevalent.[5] Death may occur in athletes who experience ER during an episode of exertional sickling.[6]

While early recognition of ER is critical to athlete health, it is challenging for student-athletes and those working with them because the signs and symptoms of ER during the triggering bout of intense exercise can be sparse and subtle. However, team outbreaks described in the literature provide valuable clues that coaches and athletic trainers should watch for in their student-athletes. Importantly, signs and symptoms of severe ER can begin in the first few hours after the triggering exercise bout and tend to peak over the subsequent two days.

ER becomes a clinical concern when there is extensive damage to muscle fibers or when cellular energy (ATP) is depleted, triggering intracellular events that can lead to ER. Specifically, these intracellular events can result in the breakdown and death of skeletal muscle cells and the release of intracellular contents. Large amounts of CK, lactate dehydrogenase and myoglobin are released into the blood. Myoglobin is cleared by the kidneys, and large amounts of it may result in acute kidney injury.

Return to Activity

Most student-athletes who develop ER will not have permanent complications and may return gradually to normal activity after proper treatment and clinical recovery.

After treatment for ER, the team physician must assess the risk of recurrence and decide if and under what conditions the athlete can safely return to play. Athletes with low risk of recurrence can undergo a gradual return-to-play protocol.[8] Effective return-to-play progression should account for the mode of exercise, intensity, volume and frequency of training. The protocol should start with low-impact aerobic activities that involve primarily concentric contractions and advance toward higher-impact, anaerobic, resistance and eccentric exercises. The CSCCA/NSCA Joint Committee guidelines[9] state that an appropriate progression of activity following ER is one that views the athlete recovering from ER as a beginning athlete.

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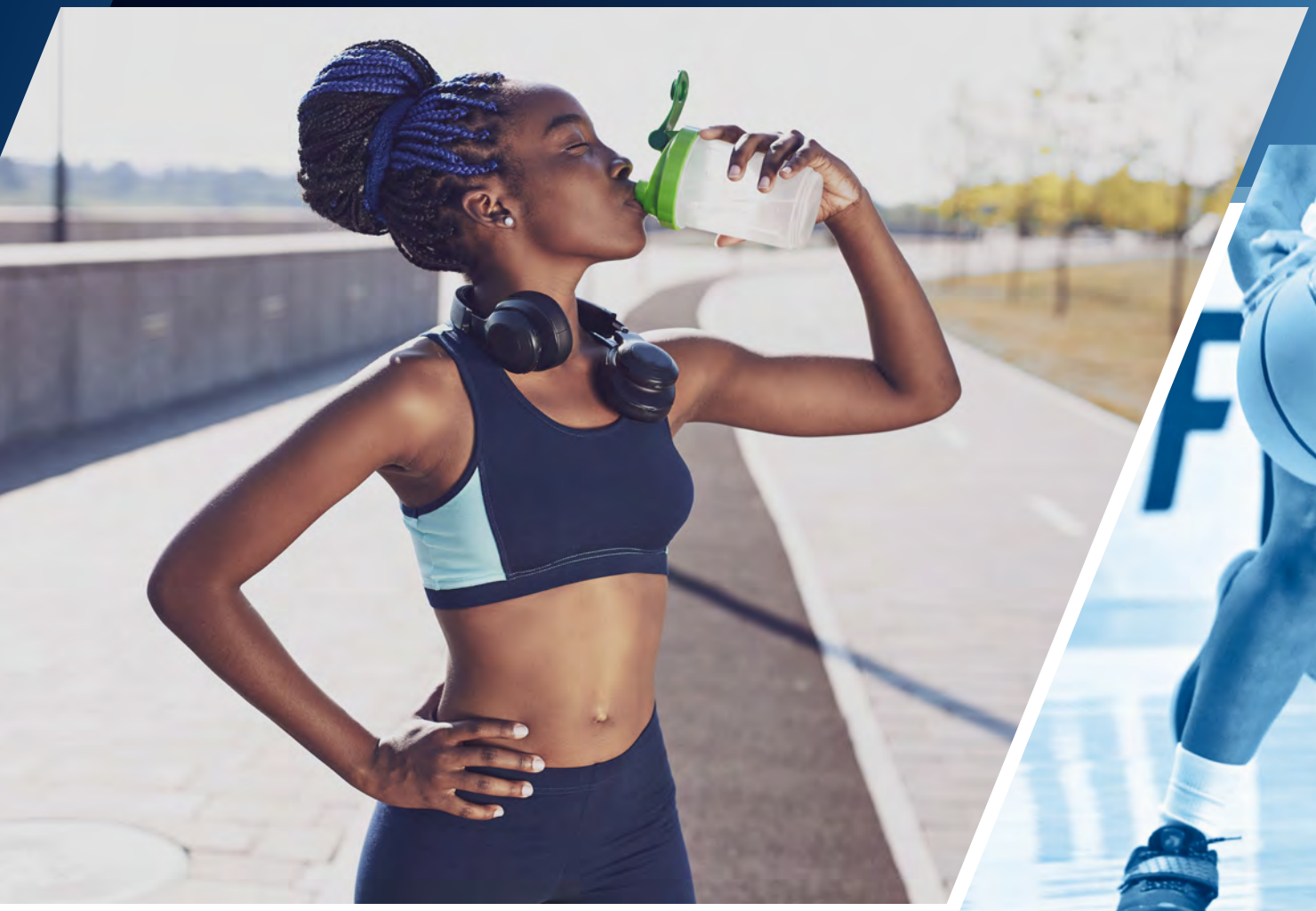

Guideline 4D
Sickle Cell Trait

Sickle cell trait is not a disease and is not a barrier to exercise or participation in collegiate sport. Exercising with sickle cell trait is generally safe and with proper awareness and education poses no barriers to outstanding athletic performance. It is possible to have symptoms of sickle cell disease under extreme conditions of physical stress or low oxygen levels. In some cases, athletes with the trait have experienced significant distress, collapsed and even died during rigorous exercise. NCAA legislation requires that a sickle cell solubility test should be included in every student-athlete's mandatory medical examination, unless documented results of a prior test are provided to the school. Through testing, proper examinations by a physician prior to competition and adherence to principles of universal training precautions,[1] student-athletes with sickle cell trait may enjoy a healthy career.

The NCAA provides **resources on sickle cell trait**, including information for **coaches** and **student-athletes**.

▶ Administrative Considerations

To reduce the risk that student-athletes will have health concerns associated with sickle cell trait, schools should consider developing and implementing policies and procedures that may include:

- A process to comply with NCAA legislative requirements on sickle cell solubility test results.
- Educational programming for **coaches**, strength and conditioning personnel, sports medicine personnel and **student-athletes** with and without sickle cell trait pertaining to relevant risk factors for health conditions and strategies to protect against those health conditions.
- Policies that support safe training and conditioning for all student-athletes and in a manner consistent with **Interassociation Recommendations: Preventing Catastrophic Injury and Death in Collegiate Athletes**.
- A policy pertaining to who is informed regarding a student-athlete's sickle cell trait status.

Background

Exercise Collapse Associated with Sickle Cell Trait (E-CAST)

E-CAST is the most significant exercise-related health risk associated with sickle cell trait and can be fatal without prompt recognition and treatment. Collaborative efforts between sports medicine and military medicine providers have recently produced recommendations on the prevention and management of E-CAST in both athletes and warfighters. In 2019, the Consortium for Health and Military Performance (CHAMP) examined the science and developed recommendations pertaining to E-CAST.[2] Its work provides detailed information on prevention, safe participation, education, differential diagnosis, management and return to participation as it relates to E-CAST. See the box for precautions to incorporate when writing and implementing policies and procedures specific to preventing E-CAST.

General Precautions to Prevent and Manage E-CAST[2]

- Provide a cool-down period wherein exercise continues for five to 10 minutes, but a much slower pace and reduced intensity.
- Have a buddy system that serves to stop a teammate when that teammate is clearly in distress and ignoring signs and symptoms.
- Recognize undue pressure (whether from a peer or a superior/coach) to finish a high-intensity workout or physical fitness test.[3]
- Educate staff and peers on what to look for in terms of early signs of distress and having them ready to call for medical assistance.
- Have access to an automated external defibrillator and oxygen in case of an emergency.

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Guideline 4E

Cardiovascular Care of College Student-Athletes

Sudden cardiac arrest and sudden cardiac death are both well-documented sport-related catastrophic injuries that can occur in athletes of all ages, including collegiate student-athletes. More specifically, they represent a category of catastrophic injury known as nontraumatic catastrophic injuries, also known as indirect or exertional injuries. They are typically the result of the exertion that occurs in sport participation.[1]

Substantive medical and policy issues exist about the evaluation and care of cardiovascular conditions in student-athletes, and more specifically, about the prevention of future cardiac-related catastrophic events. To explore these issues, the NCAA convened a two-day Cardiac Task Force in September 2014 in Indianapolis. The task force brought together more than two dozen experts representing the top medical organizations, including the National Athletic Trainers' Association, American Medical Society for Sports Medicine, American College of Cardiology and American Heart Association, among others.

The task force led to recommendations for both preventing and reacting to cardiac arrest in student-athletes, while also broadening the scope of cardiovascular care. Those recommendations can be found in the **Interassociation Consensus Statement on Cardiovascular Care of College Student-Athletes**.[2]

The consensus statement also includes the **Cardiac Care Best Practices Checklist**, a resource for schools as they consider how to incorporate the consensus recommendations into their current programs and practices.

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Guideline 4F

Catastrophic Sport Injury Reporting Mandate

NCAA Association-wide legislation requires member schools to report annually on all student-athlete fatalities and catastrophic injuries, regardless of whether such fatality/injury is sport-related. Although fatalities and catastrophic injuries among college athletes are rare, identifying the causes and circumstances of catastrophic events is critical to developing effective prevention and response strategies.

To assist with the collection of this data, the NCAA Sport Science Institute has partnered with the **National Center for Catastrophic Sport Injury Research** and the **Datalys Center**. Individuals who have been designated to report a catastrophic event occurring to an NCAA student-athlete must submit data to the center, detailing student-athlete fatalities, near fatalities and catastrophic injuries (e.g., injuries and illnesses related to the head, neck, spine, heart, lungs, heat, sickle cell trait and eyes). The reporting institution is responsible for obtaining all consents and releases necessary or required to submit this information.

The data from these reports are compiled and shared with NCAA membership committees, primarily the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports.

To report a catastrophic event through the online reporting tool, visit **sportinjuryreport.org/NCAAReport**.

To report a catastrophic event by phone, call the National Center for Catastrophic Sport Injury Research at 919-843-8357.

SECTION 5

Concussion

Guideline 5A

Concussion, Repetitive Head Impact Exposure and Brain Health

Assessment and management of concussive injuries and return-to-play decisions remain some of the most difficult responsibilities facing the sports medicine team. There are potentially serious complications from impulsive forces to the head and neck that may result in concussions, including severe head injuries, cervical spine injuries, skull fractures and/or intracranial bleeds and death. Due to these potential risks, it is imperative that the health care professionals taking care of athletes are able to recognize, evaluate and treat these injuries in a complete and progressive fashion.

The knowledge, diagnosis and treatment of concussions has and will continue to evolve with advances in evidence-based science. These guidelines are meant to support the team medical staff, including the team physician and athletic trainers who are responsible for concussion education and the diagnosis and management of concussion in student-athletes. Since there is no objective test for diagnosing a concussion, it is essential that the medical team use their clinical skills in evaluating the head-injured athlete. While each concussion and each student-athlete is different, no athlete should be allowed to return to full participation until they have successfully completed a return-to-sport protocol as outlined below.

The Committee on Competitive Safeguards and Medical Aspects of Sports (CSMAS) has provided guidance in this area for decades, and the NCAA Sports Medicine Handbook has included a chapter on concussion since 1994. CSMAS provides guidance to team medical staff based on a review of publicly available peer-reviewed publications, but CSMAS is not a research organization and does not perform independent research. As a result, these guidelines share information that is already publicly available in peer-reviewed publications. With ongoing advancements in evidence- and consensus-based medicine, knowledge continues to improve and the medical standards of care to continue to evolve.

In 2010, CSMAS urged the adoption of policies on concussion, which eventually led to the member schools passing legislation requiring schools to have such policies in place. The 2010 concussion legislation reaffirms the central role of the team physician and the school's medical staff. The 2010 legislation mandates:

- An annual process that ensures student-athletes are educated about the signs and symptoms of concussion.
- A process that ensures a student-athlete who exhibits signs, symptoms or behaviors consistent with a concussion shall be removed from athletics activities and evaluated by a medical staff member with experience in the evaluation and management of concussion.
- A policy that precludes a student-athlete diagnosed with a concussion from returning to athletic activity for at least the remainder of that calendar day.
- A policy that requires medical clearance for a student-athlete diagnosed with a concussion to return to athletics activity as determined by a physician or the physician's designee.

CSMAS has also worked with the NCAA Concussion Task Force to support the development of concussion guidelines that extended beyond the collegiate landscape, which led to three interassociation guidelines:

- **Interassociation Consensus: Diagnosis and Management of Sport-Related Concussion Best Practices**.
- **Interassociation Consensus: Independent Medical Care for College Student-Athletes Best Practices**.
- **Interassociation Consensus: Year-Round Football Practice Contact for College Student Athletes Recommendations.**

These documents represented an updated approach to addressing health and safety strategic priorities for collegiate athletes. They were the result of task forces and summits that included NCAA member school representatives, content experts and representatives from sports medicine, medical and scientific organizations. In particular, **Interassociation Consensus: Diagnosis and Management of Sport-Related Concussion Best Practices** became the basis of updating the 2010 NCAA Concussion Safety Protocol Legislation with new legislation in 2015. The updated legislation (**NCAA Division I Bylaw 20.2.4.20**) mandated that NCAA member schools have in place a concussion safety protocol consistent with the Concussion Guidelines document. This updated legislation led to the creation of a **Concussion Safety Protocol Checklist** which was based on Concussion Guidelines and served as the foundation for member school concussion safety protocols.

Given the rapid advances in concussion knowledge, especially through the **NCAA-DoD CARE Consortium**, and given external processes for developing broad concussion consensus documents, CSMAS recommended an amendment (**NCAA Division I Proposal – ER – 2020-3**) to the 2015 legislation, with the **Concussion Safety Protocol Checklist** serving as the basis of member school concussion safety protocols. CSMAS also recommended the creation of a **Concussion Safety Advisory Group**, whose primary purpose is to review the Checklist at least annually and to update the Checklist based on emerging information. Because the Checklist is the foundation for each member school's concussion safety protocol, it will also serve as the logical flow for this updated guideline. The Checklist was last updated in September 2023 and became mandatory for serving as each member school's concussion safety protocol in January 2024. The September 2023 update was largely driven by the 6th International Conference on Concussion in Sport[1] and much of this chapter is adapted from the Consensus Statement.

Concussion Definition

According to the **Consensus Statement on Concussion in Sport: the 6th International Conference on Concussion in Sport – Amsterdam, October 2022**[1] [Consensus Statement]:

> *Sport-related concussion is a traumatic brain injury caused by a direct blow to the head, neck or body resulting in an impulsive force being transmitted to the brain that occurs in sports and exercise-related activities. This initiates a neurotransmitter and metabolic cascade, with possible axonal injury, blood flow change and inflammation `affecting the brain. Symptoms and signs may present immediately, or evolve over minutes or hours, and commonly resolve within days, but may be prolonged.*

Concussion is a clinical diagnosis based on the judgment of the student-athlete's health care providers. The diagnosis (and subsequent management) of sport-related concussion is challenging for many reasons:

- Results of physical and cognitive examinations are often normal, and additional tests such as brain computerized tomography (CT), brain MRI, electroencephalograms and blood tests are also commonly normal. Although computerized or comprehensive neuropsychological tests may be useful adjunctive tools supporting the diagnosis of sport-related concussion, there is no consensus regarding their interpretation and utility as a clinical tool.
- The clinical effects of sport-related concussion are often subtle and difficult to detect with existing sport-related concussion assessment tools.
- The symptoms of sport-related concussion are not specific to concussion and it is challenging to evaluate a student-athlete who presents with nonspecific symptoms that may be related to other conditions.
- Sport-related concussion may manifest with immediate or delayed-onset symptoms. Symptom manifestation can vary between individuals and in the same individual who has suffered a repeat concussion.
- Modifying factors and co-morbidities — such as attention deficit hyperactivity disorder, migraine and other headache disorders, learning disabilities and mood disorders — should be considered in making the diagnosis, providing a management plan and making both return-to-play and return-to-learn recommendations.
- "Signal detection" on clinical measures (e.g., cognitive and balance testing) often quickly diminishes in the acute setting of early recovery. Although cognitive function and balance assessed within 24 hours with various sideline tests (Standardized Assessment of Concussion [SAC] and Balance Error Scoring System, respectively) can be useful in diagnosing concussion, results of these tests often normalize within a few days and cannot be used to make a definitive diagnosis.
- Student-athletes may underreport symptoms and inflate their level of recovery in hopes of being rapidly cleared for return to competition.
- Clinical assessment of sport-related concussion is a surrogate index of recovery, not a direct measure of brain structure and functional integrity after concussion.

This updated concussion definition does not include staging, diagnostic criteria or objective biomarkers. Thus, although there may be observable signs for a sport-related concussion, the diagnosis remains clinical and is based on a combination of reported symptoms, observed signs and a physical examination. There is no blood test, brain wave test or brain imaging study that has been approved for the diagnosis of concussion. Such tests are still being evaluated in the research setting.

Preseason Education

Concussion education is a critical component of an effective concussion management plan. Education should be provided to the following individuals:

- Student-athletes.
- Coaches.
- Team physicians.
- Athletic trainers.
- Directors of athletics.
- Other personnel involved in student-athlete health and safety decision-making.

There are many sources for concussion education materials, including through the **CDC**, **NATA** and others. The NCAA provides Concussion Fact Sheets developed by CSMAS for use by its member schools with **student-athletes**, **coaches** and **educators**.

Education remains the core responsibility of the schools' medical and coaching staff.

Although these fact sheets provide important information, they are no substitute for the team physician and athletic trainer educating their student-athletes about concussion both as part of the preseason physical exam, and on an individual basis based on the unique needs of each student-athlete. If concussion fact sheets or related materials are simply handed out to individuals, there may be limited understanding. Research from the **NCAA-Department of Defense Mind Matters Challenge led to a consensus statement** that examined five domains in concussion education, and each domain included Foundational Statements for member school consideration. The following statements have been adapted from the original article.

Foundational Statements

Domain 1 - Content of concussion education for athletes. Provide student-athletes with education that addresses:

- The potential dilemma individuals face when deciding to disclose a concussion (e.g., tradeoffs, concerns about what might happen next, knowing how to report).
- Short-term benefits of early concussion symptom disclosure (e.g., athletic, academic, occupational). What is known about possible long-term manifestations of concussion and head injury.
- Concussion-related misperceptions (e.g., knowledge gaps).
- Site-specific information regarding institutional concussion resources and policies (e.g., steps to take if an individual suspects they have a concussion).

Domain 2 - Dissemination and implementation of concussion education:

- Actively collaborate with organizational stakeholders (including coaches, primary health care providers and athletes) to select concussion education approaches that are engaging, interactive and that foster discussion.
- Share messaging about concussion symptom disclosure on a regular basis and in a variety of ways (e.g., formal education, informal conversation, posters).
- Integrate messaging about the importance of complete concussion symptom disclosure throughout the recovery process.

Domain 3 - Concussion education for other stakeholders:

- Provide coaches with evidence-based concussion education that is aimed at supporting athletes in concussion symptom disclosure.
- Provide sports medicine medical staff with strategies about how to engage coaches in supporting athletes in concussion symptom disclosure.
- Provide easily accessible information to parents/guardians about how to support athlete concussion symptom disclosure.
- Provide easily accessible information to other key site-specific stakeholders (e.g., student-life administrators, faculty athletic representatives, leadership) about how to support athlete concussion symptom disclosure.

Domain 4 - Team-level processes:

- Provide athletes with education that addresses the role they can play in encouraging peers to disclose possible concussion symptoms (e.g., share evidence-based bystander education programming).
- Provide opportunity for team members and coaches to discuss and establish team values that are supportive of concussion symptom disclosure.

Domain 5 - Organizational processes:

- Actively collaborate with organizational stakeholders (including coaches, primary health care providers and athletes) to identify and address organizational barriers to concussion symptom disclosure.
- Evaluate the effectiveness of institutionally selected concussion education approaches in changing athlete concussion symptom disclosure.
- Communicate in a deliberate manner institutional values that emphasize safety and its importance in athletic performance.

Ultimately, concussion education is not simply about content, but also about how concussion education is disseminated and implemented, including positive reinforcement for improving the culture of concussion safety. Each party that receives concussion education should sign acknowledgment of having reviewed and understood the concussion material.

Preparticipation Assessment

Although the efficacy of a concussion baseline exam in sport with regard to managing concussion at a later date is not clear-cut, a preparticipation examination provides an excellent opportunity to better understand the athlete and to help the athlete understand the risks and benefits of competing in sport. The prior standard of performing a computerized neuropsychological assessment for comparison after concussion is no longer recommended as a stand-alone test for managing concussion.[2]

Each athlete and each injury is different. Depending on the severity of prior injuries, the number of concussions and other individual concerns, and based on the developing state of science, the team physician/primary health care provider should review each athlete's history and consider discussing with the student-athlete concerns about concussion and repetitive head impact as warranted, including potential risks and benefits from playing sport. Such discussion allows the athlete to make an informed decision about their participation in sport.

The preparticipation assessment should include an overview of the following:

- History of concussion or brain injury, neurologic disorder and mental health symptoms and disorders.
- Symptom evaluation.
- Cognitive assessment.
- Balance evaluation.

In keeping with **Independent Medical Care** legislation, the team physician determines preparticipation clearance and/or the need for additional consultation or testing.

Baseline testing may inform postinjury evaluation; however, student-athletes who have had a concussion may perform at the same level or even better than their baseline testing, as motivation and other factors may differ in postconcussion testing. Ultimately, baseline testing serves as one of many potential factors in making a clinical decision. A new baseline assessment may be considered six months or beyond for any student-athlete with a documented concussion, especially those with a complicated presentation/recovery, multiple concussions or high exposure to repetitive head impacts.

Recognition and Diagnosis of Concussion

In collegiate sport, all athletics personnel should be educated in understanding and recognizing core aspects of concussion presentation. If there is ever any doubt whether an athlete has suffered a concussion, it is best to err on the side of caution (i.e., 'when in doubt, sit them out'). Recognition and diagnosis of concussion is ultimately overseen by the primary athletics health care providers (i.e., team physicians and athletic trainers, all of whom should have received training in the diagnosis and management of concussion). Concussion may occur during practice, a competitive event or in a setting unrelated to sport. Schools must adhere to the following action plans for competitions and practice.

Medical personnel with training in the diagnosis, treatment and initial management of acute concussion must be "present" at all NCAA competitions in the following contact/collision sports: acrobatics and tumbling, Alpine skiing, baseball, basketball, beach volleyball, diving, equestrian, field hockey, football, gymnastics, ice hockey, lacrosse, pole vault,

rugby, soccer, softball, volleyball, water polo and wrestling. To be present means to be on site at the campus or arena of the competition. Medical personnel may be from either team or may be independently contracted for the event.

Medical personnel with training in the diagnosis, treatment and initial management of acute concussion must be "available" at all NCAA practices in the following contact/collision sports: acrobatics and tumbling, Alpine skiing, baseball, basketball, beach volleyball, diving, equestrian, field hockey, football, gymnastics, ice hockey, lacrosse, pole vault, rugby, soccer, softball, volleyball, water polo and wrestling. To be available means that, at a minimum, medical personnel can be contacted at any time during the practice via telephone, messaging or email.

The recognition of concussion is the first step in helping to assure prompt and appropriate management. The table below identifies some signs and symptoms of concussion. Any athlete with a suspected concussion should be removed from the field of play or practice for a prompt evaluation. Signs that warrant discontinuation of participation include actual or suspected loss of consciousness, seizure, tonic posturing, ataxia, poor balance, confusion, behavioral changes and amnesia.[21] Players exhibiting these signs should not return to competition or training that day unless evaluated acutely by an experienced health care professional with a multimodal assessment (as noted below) who determines that the sign was not related to a concussion and that it is safe for the student-athlete to participate.

The clinical manifestations of concussion may present with immediate symptoms or signs or may sometimes manifest over several hours. For this reason, even when an initial evaluation reveals no symptoms or signs of concussion, the practitioner may consider reevaluations over the next day in high-risk scenarios (e.g., an observed severe implosive impact – directly or indirectly – to the head).

Once concussion is suspected, the primary athletics health care provider must immediately evaluate the athlete. Ideally, the assessment is performed away from the field of play in a quiet, distraction-free setting. The concussion assessment normally takes 10-15 minutes. According to the Consensus Statement, the **Sport Concussion Assessment Tool 6** (SCAT6) can serve as a 'template' for a concussion evaluation; some practitioners may use similar tools. The key is that the SCAT6 provides a broad base for covering multiple aspects of a physical and neurological exam that aids in making a clinical diagnosis of concussion. The multi-modal assessment for concussion should include:

- Assessment for symptoms.
- Physical and neurological exam.
- Cognitive assessment.
- Balance exam.
- Clinical assessment to rule out more serious injury, as noted below.

If the concussion evaluation leads the practitioner to confirm or suspect concussion, the athlete must be removed from practice/play for that calendar day. Same day return to play is warranted only if a concussion or other limiting health condition is not suspected after the evaluation.

An impulsive force could cause more severe injuries, such as a severe traumatic brain injury, seizure, basilar skull fracture, subdural hematoma, cervical spine fracture, second-impact syndrome, epidural hematoma or multi-trauma presentations. All concussion evaluations should include an assessment for potential 'red flags.' If a more serious injury is suspected, then an emergency action plan must be followed. Such an action plan includes, but is not limited to:

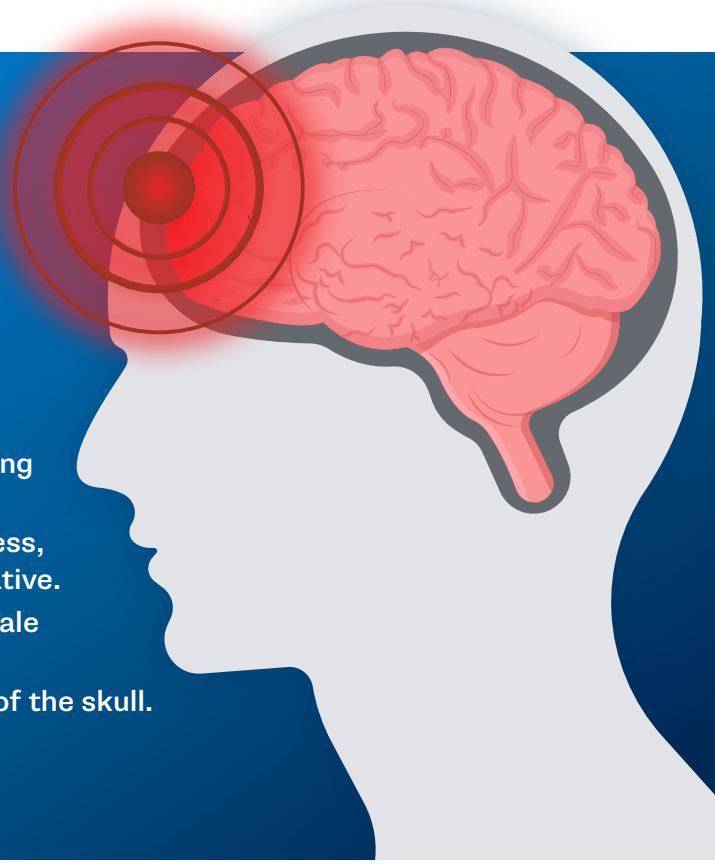
- Cervical spine stabilization.
- Seizure management.
- Skull fracture management.
- Intracranial bleed management.

Some Signs and Symptoms of Concussion

- Appears dazed or stunned.
- Forgets an instruction.
- Is confused about an assignment or position.
- Is unsure of the game, score or opponent.
- Appears less coordinated.
- Answers questions slowly.
- Headache or head pressure.
- Nausea.
- Balance problems or dizziness.
- Double or blurry vision.
- Sensitivity to light or noise.
- Feeling sluggish, hazy or foggy.
- Confusion, concentration or memory problems.

Providers should always have in place a plan that allows for prompt cervical spine stabilization and direct access for emergency medical services. A student-athlete must be immediately removed from play and assessed for possible transport to a local hospital or transport center when any of the following signs, symptoms or behaviors are present:

- Neck pain or tenderness.
- Seizure or convulsion.
- Double vision.
- Loss of consciousness.
- Weakness or tingling/burning in more than one arm or in the legs.
- Deteriorating conscious state.
- Vomiting.
- Severe or increasing headache.
- Increasingly restless, agitated or combative.
- Glasgow Coma Scale Score < 15.
- Visible deformity of the skull.



Postconcussion Management

Serial evaluations up to 72 hours are warranted in immediate postconcussive management because concussion symptoms and signs may evolve over one to three days. Additionally, documentation of a postconcussion plan of care should be noted in oral and written form both from the student-athlete and another adult responsible for the student-athlete.

Subacute (Three Days to Weeks Postinjury) Management

For many years, the first several days, and sometimes weeks, of a postconcussion management plan included 'cocoon therapy,' in other words, placing the athlete in a dark, quiet environment of relative or complete bed rest. The rationale was that there existed a mismatch between decreased brain blood flow and increased metabolic demands of the brain. In many instances, individuals with concussion were kept on relative bed rest until all postconcussion symptoms resolved.

There are several emerging paradigm shifts in postconcussion management. Firstly, strict or relative bed rest is no longer encouraged beyond the first day, and individuals are encouraged to begin light exercise as tolerated following the first day postconcussion. Early initiation of light exercise improves concussion recovery and allows earlier return to play;[3] specifically, symptom-limited, light aerobic physical activity within 24-48 hours (e.g., walking) may be beneficial (coupled with reduced screen use for the first 48 hours postinjury).[4] Such exercise may be important in the activation of brain-derived neurotrophic factors that aid in recovery. Early exercise may also counterbalance fear avoidance following concussion, which could lead to mental health symptoms that may prolong concussion recovery. Secondly, emerging evidence reveals that it is typical to recover from concussion injury, but persisting symptoms may develop that commingle with concussion but are not direct manifestations of concussion per se.[5]

Persisting symptoms may be largely grouped into the following categories:

- Vestibular.
- Cognitive.
- Fatigue.
- Anxiety and mood.
- Headache, migraine and cervicalgia.
- Ocular.
- Dysautonomia (e.g., orthostatic hypotension).

The Consensus Statement[1] notes:

> *If dizziness, neck pain and/or headaches persist for more than 10 days, cervicovestibular rehabilitation is recommended. For children, adolescents, and adults*

The following core mechanisms for evaluation and monitoring of concussion recovery and persisting symptoms should be in place:

- Symptom evaluation.
- Immediate and delayed memory.
- Concentration.
- Orthostatic vital signs.
- Cervical spine assessment.
- Neurological evaluation.
- Balance and tandem gait assessment.
- Modified Visual Ocular Motor Screening.

In addition, consider evaluating for the following, as clinically indicated:

- Fear, anxiety, depression or other mental health issues.
- Sleep disturbance.
- Graded aerobic exercise testing.

with dizziness/balance problems, either vestibular rehabilitation or cervicovestibular rehabilitation may be of benefit. The inclusion of subsymptom threshold aerobic exercise in combination with other treatments should be considered. In the case of a recurrence of symptoms when progressing through the return-to-learn or return-to-sport strategies, re-evaluation and referral for rehabilitation may be of benefit to facilitate recovery.

Although clear evidence for targeted therapy based on persisting symptoms is still emerging, it is worth considering such therapy as opposed to simply attributing persisting symptoms to the original concussion injury. Importantly, symptoms may overlap and therefore a thorough review of symptoms in conjunction with a physical and neurological exam is warranted. For example, dysautonomia (orthostatic hypotension) may present with complaints of 'dizziness.' Cognitive dysfunction may result from disordered sleeping, and disordered sleeping may exacerbate anxiety and mood disorders. Headache may present as posttraumatic migraine or as an expression of cervicalgia. Dizziness, difficulty concentrating and poor reading retention may result from convergence insufficiency. When overlapping symptoms do not have a clear-cut etiology, referral to a specialist (e.g., neuropsychologist, licensed mental health provider, sleep specialist, neuro-ophthalmologist) should be considered.

Evaluation tools, such as the recently released **Sport Concussion Office Assessment Tool 6** (SCOAT6) may be helpful in providing a standardized framework for a clinical, office-based evaluation, especially for school athletics health care settings in which physicians are not embedded.

Reevaluation

Given the emerging paradigm shift that concussion recovery is the norm and that persisting symptoms may prolong clinical recovery independent of brain recovery from concussion per se, athletes with persisting symptoms for more than four weeks should be reevaluated by a physician to assess for additional diagnoses, best management options and consideration of referral. If symptoms persist, other diagnoses that may account for persisting symptoms include, but are not limited to:

- Fatigue and/or sleep disorder.
- Migraine or other headache disorders.
- Mental health symptoms and disorders.
- Ocular dysfunction.
- Cervical and vestibular dysfunction.
- Cognitive impairment.
- Autonomic dysfunction, including orthostatic intolerance and postural orthostatic tachycardia syndrome.
- Pain.
- Depression.
- Anxiety.
- Substance misuse.

Many diagnoses, such as depression, are common and treatable. Student-athletes should be encouraged to receive appropriate medical care and treatment.

Return-to-Learn Management

The vast majority of young adults have full return-to-learn with no additional academic support by 10 days post-injury. Complete rest and isolation should be avoided, even during the initial 24-48 hours postinjury. Relative rest is important in the first 24 hours. For student-athletes with persisting symptoms, a more formal plan may be in order. Importantly, return-to-learn is foundational postconcussion, and should be in place prior to full return-to-sport, as outlined below.

A return-to-learn management plan should be part of a member school's concussion safety protocol. Each student-athlete should be assigned a point person within athletics who will help them navigate their return to learning. When return-to-learn is prolonged, a multidisciplinary team (see table below) may be required.

The multidisciplinary team may include, but is not limited to:		
Team Physician	Athletic Trainer	Psychologist/Counselor
Academic Counselor	Course Instructor(s)	College Administrators
Neuropsychologist	Medical Specialists	Coaches
Faculty Athletics Representative	Office of Disability Services Representatives	

Individualized initial plans should include return to classroom/studying as tolerated. The plan may address environment, physical, curriculum and/or testing adjustments.

Reevaluation by a team physician (or their designee) should be considered if concussion symptoms worsen over time with academic challenges. Modification of schedule/academic accommodations should be considered, as indicated, with help from the identified point person. Reevaluation by a team physician and members of the multidisciplinary team should be considered, as appropriate, for any student-athlete with persisting symptoms. Engaging campus resources should be considered for cases that cannot be managed through schedule modification/academic accommodations. Such campus resources must be consistent with the American with Disabilities Act Amendment Act (ADAAA), and include at least one of the following:

- Learning specialists.
- Office of disability services.
- ADAAA office.

Return-to-Sport

A return-to-sport management plan should take place in parallel with return-to-learn. Athletes who have not been able to return-to-learn because of ongoing symptomatology should not be fully engaged in competition. The return-to-sport management plan should specify:

- Final determination of unrestricted return-to-sport is from the team physician or medically qualified physician designee.
- Complete rest and isolation should be avoided, even for the initial 24-48 hours. Relative rest is important in the first 24 hours.
- Each NCAA student-athlete with concussion must undergo a supervised stepwise progression* management plan by a health care provider with expertise in concussion that specifies the following steps:

Step 1

Symptom-limited activities of daily living.

Step 2

Aerobic exercise with light resistance training as tolerated (no more than mild or brief exacerbation of symptoms). ***Light*** (up to approximately 55% maximum heart rate); ***Moderate*** (up to approximately 70% maximum heart rate).

Step 3

Individual sport-specific exercise and activity without any increased risk of inadvertent head-impact exposure. *Proceed to Step 4 only after resolution of signs and symptoms related to the current concussion, including with and after physical exertion.*

Step 4

Noncontact practice with progressive resistance training.

Step 5

Unrestricted practice or training.

Step 6

Unrestricted return-to-sport.**

**It is typical for each step to be ≥ 24 hours.*
***Unrestricted return-to-sport should not occur prior to unrestricted return-to-learn for injuries occurring while the athlete is enrolled in classes.*

Reducing Repeated Head Impacts

Head impact exposure/repeated head impacts is a relatively new term within sports medicine and concussion medicine. The **NCAA-Department of Defense CARE Consortium** study is the first prospective, longitudinal study that has been systematically measuring head impact exposure. Whereas it was formerly believed that concussion was the most important metric to measure with regard to long-term brain health and sport, emerging information suggests that repeated head impacts may be the more important metric. In essence, head impact exposure is a measure of forces to the brain via linear or rotational acceleration. Head impact exposure may be measured indirectly via sensors within a helmet, mouthguard sensors or other externally placed devices on the external skull. These methods are estimates and not direct measurements of impulsive forces to the brain. The technology and use of head impact sensors have changed considerably since their introduction, but considerable limitations remain. Head impact study data cannot be used to extrapolate to a specific individual player because style of play, protective equipment, position, coaching and even the technology and analytic methods change considerably from team to team, and over time.

Although head impact exposure represents a force to the brain, the term denotes a force that does not lead to the clinical manifestations of concussion. It is still in the early stages of understanding repetitive head impacts, and common sense and the latest research show that the vast majority of measured head impacts are well below the threshold necessary to potentially cause a concussion. Importantly, the threshold level of force that may potentially contribute to injury is currently unknown.

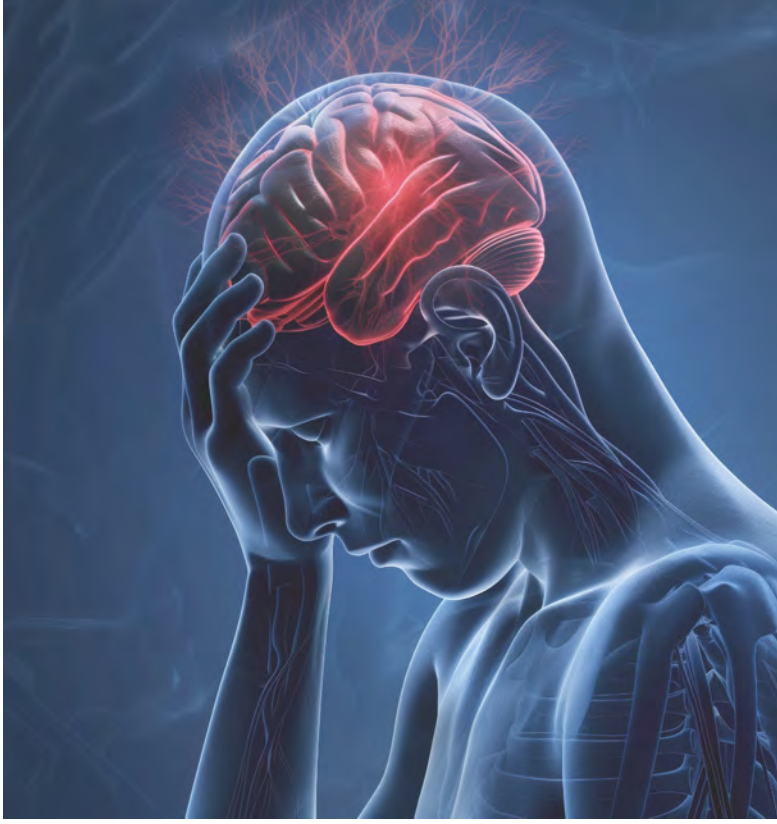
Prior to commencing the NCAA-DoD CARE Consortium, a gap analysis among leading scientists revealed the following:

- The natural history of concussion is unknown.
- It is unknown which functional domains are reliably impaired following concussion.
- It is unknown if specific functional domains are more or less predictive of recovery trajectory.
- It is unknown if all sports-related concussions are the same, either across sport or across sexes.
- The neurobiology of concussion is unknown.
- It is unknown if concussion or repetitive head impact exposure is the right metric.
- It is unknown if there is a disconnect between the clinical and the neurophysiological return-to-play point.
- The role of neuroimaging, biomarkers, fluid biomarkers and genotype biomarkers in answering these gaps is unknown.

Notwithstanding the gaps in our understanding, schools should have in place a management plan that reduces head impact exposure. While the risk of injury, including head injury and repetitive head impacts, are an inherent part of many sports, efforts to reduce head impact exposure should be done in a manner consistent with **Interassociation Recommendations: Preventing Catastrophic Injury and Death in Collegiate Athletes** and the Consensus Statement.[1] Examples include:

- All practices and competitions adhere to existing ethical standards.
- Using playing or protective equipment (including the helmet) as a weapon is prohibited during all practices and competitions.
- In all practices and competitions, deliberately inflicting injury on another player is prohibited.
- All playing and protective equipment (including helmets), as applicable, meet relevant equipment safety standards and related certification requirements.
- All contact/collision, helmeted practices and competitions adhere to keeping the head out of blocking and tackling.
- Emphasizing education of proper technique to reduce head impact exposure for all contact and collision sports, with a special emphasis in the preseason.
- Adhering to policies and rules in sport that limit the number and duration of contact practices and activities in contact-collision sports.
- Consideration of participation in neuromuscular training warm-up programs.
- For ice hockey: It is recommended that all players wear a mouthguard.

Chronic Traumatic Encephalopathy



According to the CDC: "Chronic traumatic encephalopathy (CTE) is a brain disease that affects how the brain works. It is linked to a build-up of abnormal proteins that damage brain tissue and cause brain cells to undergo cell death. Research suggests CTE is associated with long-term exposure to repeated hits to the head (head impacts). There is no strong evidence that shows that getting one or more concussions (or other mild traumatic brain injuries) or occasional hits to the head leads to CTE. More research is needed to better understand:

- Potential risk factors for CTE, including the role of a person's sex, genetics, medical history, and environmental and lifestyle factors.
- How the CTE disease process begins.
- Why some people with a history of long-term exposure to repeated head impacts develop CTE and others do not.

Conclusion

Although research and consensus statements have provided more clarity to concussion and repetitive head impact diagnosis and management, there is still much to study and to learn. To remain current with emerging information, the NCAA, upon the recommendations of the CSMAS, formed a Concussion Safety Advisory Group. As noted above, this group has updated the Concussion Safety Protocol Checklist which serves as the foundation for all member schools' concussion safety protocols. When assessing all relevant emerging information for the Checklist update, the CSAG also recommended that:

- No NCAA sport should be eliminated.
- Repetitive head impact exposure in football and other contact/collision sports should continue to be evaluated and limited, where possible, through rules and innovative technology.
- The development of science, changes to the style of play and practice, and evolution of playing rules should press forward.

Importantly, while the scientific community continues to study emerging hypotheses regarding the potential for consequences later in life, steps have been taken over the years to reduce the inherent risks of concussion, head injury and repetitive head impacts. As concussion and head impact exposure may potentially negatively impact brain health, medical professionals, coaches, administrators, athletic trainers and all those involved should continue to prioritize health and safety, including continuing to evaluate how to reduce concussion and head impact exposure in sport while managing their inherent risk in sport effectively consistent with emerging evidence- and consensus-based recommendations.

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5. Yeates KO, Raisanen AM, Premji Z, et al. What tests and measures accurately diagnose persisting post-concussive symptoms in children, adolescents and adults following sport-related concussion? A systematic review. *Br J Sports Med*. Jun 2023;57(12):780-788. doi:10.1136/bjsports-2022-106657

SECTION 6

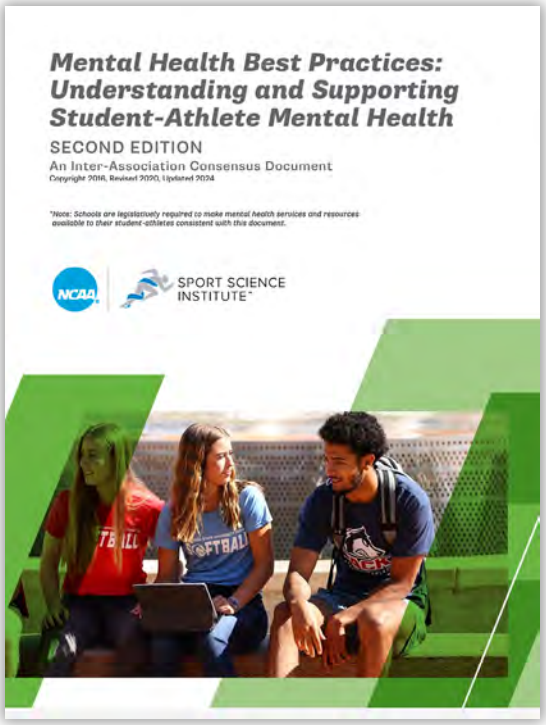
Mental Health

Guideline 6A

Mental Health Best Practices

The NCAA recognizes mental health as an important dimension of overall health and thus has a constitutional commitment to support schools in designing athletics programs that protect, support and enhance the mental health of student-athletes. As required by NCAA legislation, each school is required to make mental health services and resources available to its student-athletes. Provision of those services and resources must be consistent with the **NCAA Mental Health Best Practices for Understanding and Supporting Student-Athlete Mental Wellness, 2nd Edition** which was first published in 2016 and most recently updated in 2024. Additional resources to support the implementation of the Mental Health Best Practices can be found **here**.

The 2014 publication *Mind, Body and Sport: Understanding and Supporting Student-Athlete Mental Wellness* was a product of the NCAA Mental Health Task Force and key medical and mental health organizations. This foundational work led to the creation of the current Mental Health Best Practices document.



SECTION 7

Social and Interpersonal Health

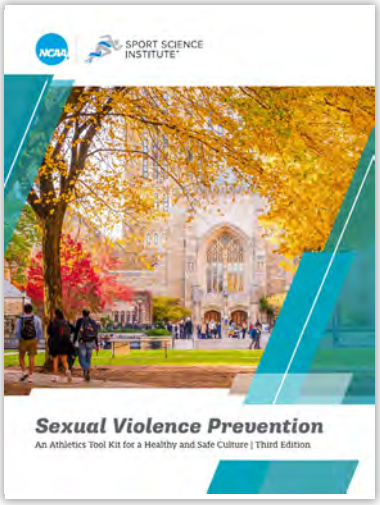
Guideline 7A

Sexual Assault and Interpersonal Violence

Sexual misconduct, including sexual and gender-based harassment, sexual assault/sexual violence, stalking and intimate partner violence, is embedded in American society and affects people at all socioeconomic levels in our culture. Institutions of higher education and their athletics programs are not immune to the attitudes and behaviors that contribute to these behaviors which have created a major public health threat that demands a strong and comprehensive public health response.

The NCAA has published several resources to help NCAA schools develop and promote a culture on campus that is free from sexual misconduct. These include:

- **Sexual Violence Prevention: An Athletics Tool Kit for a Healthy and Safe Culture**. The NCAA Sexual Assault Task Force, comprised of sexual violence prevention experts and membership representatives, convened in 2015 to assemble key elements regarding prevention of sexual violence. The task force initiated the 2016 publication, updated in 2020 and 2023, which provides guidance to member schools on efforts to prevent sexual violence.
- **NCAA Board of Governors Policy on Campus Sexual Violence**. In 2017, following publication of the Tool Kit, the Board of Governors adopted an Association-wide policy to reinforce previous efforts of the Association in addressing campus sexual violence.
- **Addressing Sexual Assault and Interpersonal Violence: Athletics' Role in Support of Healthy and Safe Campuses**. In 2014, the NCAA published this resource providing key elements for consideration in preventing sexual violence.



Guideline 7B

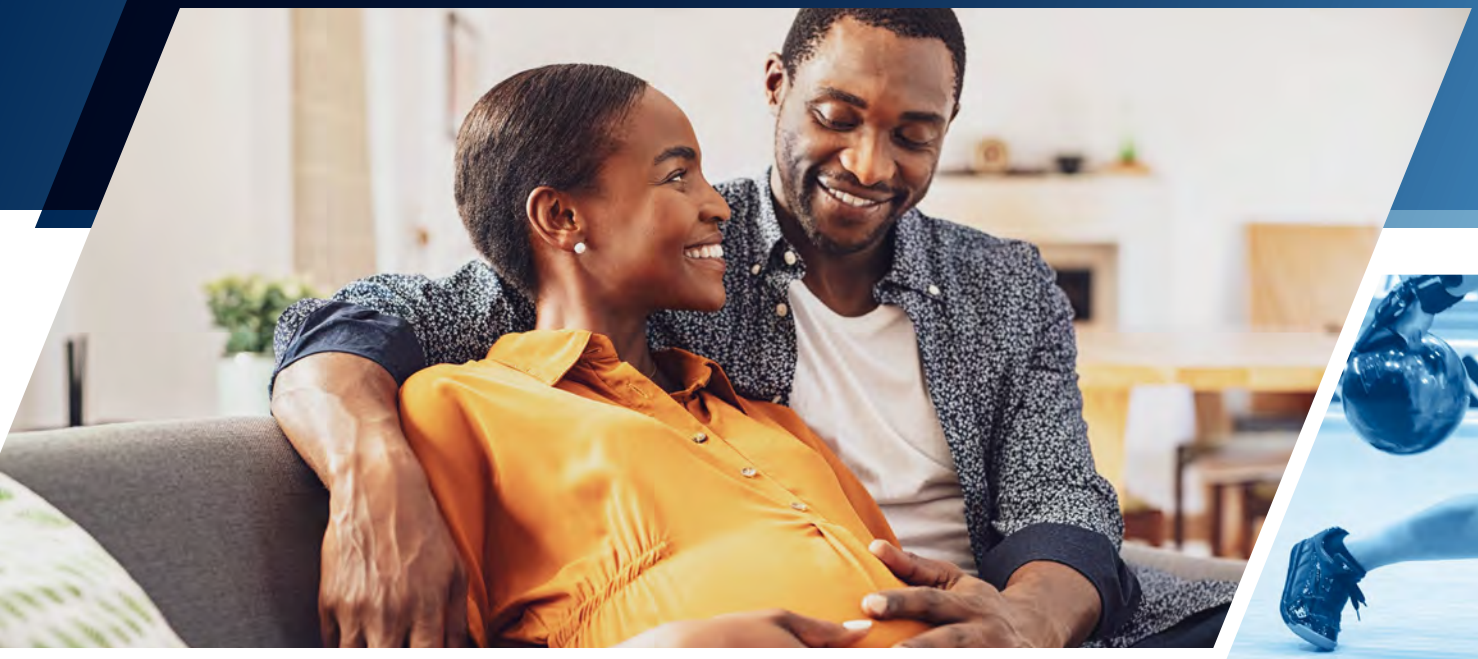
Participation Policy for Transgender Student-Athletes

The NCAA **participation policy for transgender student-athletes** was updated on Feb. 6, 2025. The policy provides definitions and clarifies participation opportunities for transgender student-athletes.

Student-athletes taking a banned substance (e.g., testosterone) must complete the **medical exception process**.

Supporting Transgender and Nonbinary Student-Athletes

The NCAA encourages schools to explore, identify and utilize all available resources as they consider how to create an inclusive environment that develops the mental and physical health of all student-athletes, including transgender and nonbinary student-athletes. Such resources may include, among others, the **Gender Identify and Student-Athlete Participation Summit Final Report**, **resources** designed to support LGBTQ student-athletes, coaches and administrators, as well as **resources** available in the NCAA Mental Health Best Practices.



Guideline 7C

Pregnancy and Reproductive Health

Reproductive health is an important component of overall student-athlete health, including considerations for menstruation- and pregnancy-related conditions, as well as prevention of unintended pregnancy.

Administrative Considerations

Reproductive health can place unique challenges on the student-athlete. Each member school is encouraged to consider having a policy that outlines access to birth control and the rights and responsibilities of student-athletes with pregnancy-related conditions. The policy should cover:

- Where and how the student-athlete can receive confidential counseling and timely reproductive health care, including access to birth control.
- Federal and state laws surrounding pregnancy-related conditions, including the U.S. Department of Justice **Title IX** regulations.
- Treating pregnancy like any other temporary health condition with regard to receipt of institutional grants-in-aid.
- A statement that NCAA legislation permits an extension of the period of eligibility for a student-athlete for reasons of pregnancy.
- Model practices identified in the American College of Obstetricians and Gynecologists Committee Opinion on Physical Activity and Exercise During Pregnancy and the Postpartum Period.[1]

Student-athletes should not be forced into decisions about their pregnancy because of financial or psychological pressure or fear of losing their athletics scholarship. The sports medicine staff should be well-versed in the athletics department's policies and be able to access the identified resources. The sports medicine staff should respect the student-athlete's requests for confidentiality until there is a medical reason to withhold the student-athlete from competition.

Reference

1. Syed H, Slayman T, DuChene Thoma K. ACOG Committee Opinion No. 804: Physical activity and exercise during pregnancy and the postpartum period. *Obstet Gynecol*. Feb 1 2021;137(2):375-376. doi:10.1097/AOG.0000000000004266

SECTION 8

Role of Policy and Data in Student-Athlete Health and Safety

Guideline 8A

Institutional Performance Program

The NCAA Institutional Performance Program offers NCAA member schools data models, data management and data reporting to support them in their efforts to safeguard the health and well-being of student-athletes and to promote the integrity of the school. Most of the data contained in the IPP data management system is collected from member schools by the NCAA as a condition of membership.

In the 2017-18 academic year, Divisions I and II chose to augment the IPP system by requiring member schools in those divisions to complete a student-athlete health and safety survey on an annual basis pursuant to policies and procedures as determined by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports. Data generated by that survey are then made available to member schools by the NCAA in a manner consistent with the policies, structures and functions of the IPP system. Completion of an annual health and safety survey is optional for Division III member schools.

A useful feature of the IPP system is that it facilitates comparative analysis at the divisional, conference or member school level. Users can create a member school "peer group," which allows for school-by-school comparison on any of the data included in the system.

The IPP system can be accessed through the NCAA Applications environment. A member school's single-source sign-on administrator may grant access to the IPP application to anyone on campus with a single-source sign-on account, provided the school's chancellor/president has approved that individual(s) to receive access. Athletic health care providers who wish to use the IPP system should contact their school's single-source sign-on administrator.

Additional division-specific information about the IPP is available for **Division I**, **Division II** and **Division III**.

Guideline 8B

Injury Surveillance in Health and Safety

Sports injury surveillance plays a crucial role in the health, safety and performance of NCAA student-athletes. Sports medicine departments at NCAA schools are routinely faced with unique challenges during clinical care of student-athletes and seek answers to pressing questions about injury management and prevention. By providing evidence-based knowledge to help understand associations between sport participation and injuries, surveillance enhances injury prevention practices, risk-management decisions, athletic health care delivery, and ultimately, the quality of student-athlete care at all NCAA schools.

The NCAA Injury Surveillance Program, formerly known as the NCAA Injury Surveillance System, has provided timely and reliable data on injuries that result from sport participation since 1982. In 2009, the NCAA began its partnership with the Datalys Center for Sports Injury Research and Prevention to enhance the ISP by transitioning to a system that is compatible with schools' electronic medical record systems. The Datalys Center, an independent, nonprofit organization, manages data collection, analysis and information dissemination in response to the needs of the NCAA membership and staff. The ISP is now the largest injury database for college sports.

How the NCAA Injury Surveillance Program Works

The NCAA ISP relies on athletic trainers and other sports medicine staff to contribute data. Upon volunteering to participate in the ISP, sports medicine staff enter data on practice and competition activities through a compatible EMR system. They record injury information within their EMR systems as part of their routine medical practice and also report additional information, including the number of student-athletes participating at each school-sanctioned activity. All ISP data are de-identified during data submission, and the system is both HIPAA- and FERPA-compliant.

To help make the data submission process easier, the Datalys Center continuously seeks to expand the list of ISP-compatible EMRs. Currently, the ISP is compatible with six commonly-used EMR systems: Athletic Trainer System, CSMI Solutions SportsWare Online, Healthy Roster, PyraMED, Smartabase (formerly by Fusionsport, now acquired by Teamworks) and Vivature NExTT. ISP participants receive free training and support through the Datalys Center in collaboration with certified vendors. Depending on the EMR system, once entered, data are either automatically submitted to the ISP, or the user submits the data. Schools without a compatible EMR can still be part of the ISP by using the Injury Surveillance Tool, a free, web-based system developed by the Datalys Center.

The NCAA's goal, and its request, is that each participating school submits data for two to three sports per season. For schools with a compatible EMR, participation requires about 20 additional minutes of data entry per week, per sport. Staff at the Datalys Center can advise schools on their participation decisions based on both the school's sport sponsorships as well the information needs of the ISP. Greater participation will enhance the ISP and expand its capacity to support the health and safety initiatives of the NCAA. Schools that are willing to submit data for more than two to three sports per season, or for all of their sports, are welcome and encouraged to do so.

Benefits of Participating in the ISP

Schools participating in the ISP can:

- Enhance the quality of student-athlete health care at their institution.
- Request customized reports corresponding to institutional injury incidence patterns relative to Association-wide aggregate data.
- Access aggregate data that can inform injury prevention practices, risk and personnel management and medical decision-making at their school.
- Contribute to national health and safety policy and sport rules changes.
- Advance scientific research about health and safety risks to student-athletes.
- Receive free continuing education units for athletic trainers (BOC Category B: Participating member of a clinical research study).

Participating NCAA schools may request their data from the Datalys Center at any time. In addition, aggregate ISP data are frequently presented at scientific conferences and made publicly available through peer-reviewed publications documented on the **Datalys Center website**.

How Data from the ISP are Used

The ISP assists in the development and continued improvement of Association-wide student-athlete health and safety initiatives. Data from the ISP are used by the NCAA Sport Rules Committees, NCAA Committee on Competitive Safeguards and Medical Aspects of Sports, NCAA Sport Science Institute and participating schools to monitor injury trends over time, inform policy and sport rules changes and make evidence-based decisions to promote improvements to health and safety. ISP data have also led to commissioned research studies aimed at better understanding the underlying factors that contribute to observed surveillance findings.

Questions regarding the ISP should be directed to its Director, Dr. Avinash Chandran (**avinashc@datalyscenter.org** or 1-855-832-4222) or the Sport Science Institute at **ssi@ncaa.org**.

Guideline 8C

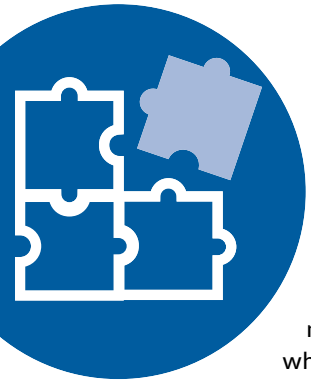
NCAA Legislation and Policy in Health and Safety

The purpose of this guideline is to provide resources about the NCAA legislative process and, more broadly, about how NCAA legislation addresses the physical and mental health, safety and performance of student-athletes. Current NCAA legislation addresses several topics relevant to the health and safety of student-athletes including, but not limited to, institutional responsibility and control, medical expenses, banned drugs, student-athlete eligibility, playing and practice season configurations, concussion management and independent medical care.

Information found at the following links outlines the NCAA governance and legislative process for each of the three divisions and for Association-wide governance committees:

- **How the NCAA works: Association-Wide.**
- **How the NCAA works: Division I.**
- **How the NCAA works: Division II.**
- **How the NCAA works: Division III.**

Divisions I, II and III each maintain a separate manual containing all legislation applicable to the division, including those provisions common to all three divisions. Online versions of these divisional manuals can be found through **Legislative Services Database Internet** or **NCAA Publications**. Sports medicine personnel are encouraged to familiarize themselves with the manual and relevant legislation. For specific questions on legislative application, sports medicine personnel should work with their campus athletics compliance administrators.



Each manual is generally structured in the following manner:

Constitution

Articles 1 through 6 of each divisional manual comprise the *NCAA Constitution*, which includes provisions about the structure and organization of the Association and the principles to which schools commit themselves by becoming NCAA members for the conduct of intercollegiate athletic programs. The constitution is the same for all divisions.

One of the principles outlined in the constitution is Student-Athlete Well-Being (NCAA Constitution, Article 1.4). Specifically, this principle establishes that intercollegiate athletics programs shall be conducted in a manner designed to protect, support and enhance the mental and physical health, safety and performance of student-athletes. Additionally, Article 2 of the constitution outlines the responsibilities of the Association, divisions, conferences and member schools. This specifies the mechanisms to develop and promulgate guidance, rules and policies based on consensus of the medical, scientific, sports medicine and sport governing communities, as appropriate, for student-athlete mental and physical health, safety and performance (Article 2-A-2-b). Finally, the constitution requires NCAA schools to establish an administrative structure that provides independent medical care for student-athletes (Article 2-D-1-d). (See **Guideline 1B: Independent Medical Care for Student-Athletes**.)

Operating Bylaws

Articles 7 through 21 are known as the *operating bylaws* and consist of legislation to promote the principles enunciated in the constitution and to achieve the Association's goals. The operating bylaws are unique, though similar, across divisions. The operating bylaws include several provisions intended to support student-athlete well-being such as medical expenses, playing and practice limitations, banned drugs and concussion management.

Administrative Bylaws

Articles 31 and 32 contain the administrative bylaws, which set forth policies and procedures for the implementation of the NCAA championships and the business of the Association.

Association-Wide Governance

While each NCAA division is empowered with setting its own rules and operating guidelines, some topics affect college sports as a whole and benefit from a coordinated approach across the divisions. For these situations, committees composed of representatives from all three divisions make recommendations that address matters of concern for the entire Association. These *Association-wide committees* work collaboratively and simultaneously with each division's governance structure to recommend legislation and to respond to other policy issues within their jurisdictions.

The Association-wide committee with responsibility for promoting student-athlete mental and physical health, safety and performance is the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports. CSMAS is charged with providing expertise and leadership to the Association to promote a healthy and safe environment for student-athletes through research, educational collaboration and policy development. Specifically, NCAA bylaws authorize CSMAS to:

- Promote and sponsor research to address relevant health and safety issues.
- Promote education to enhance the health and safety of student-athletes.
- Operate a national injury surveillance program to monitor injury trends and enhance safety in intercollegiate athletics.
- Deter the use of NCAA banned substances in order to promote fair competition and safety.
- Facilitate outreach activities to enhance student-athlete health and safety.
- Provide a health and safety perspective on relevant legislation and policy.

Association-wide committees like CSMAS cannot formally introduce legislative proposals, nor can they approve legislation. Instead, these groups propose legislation or legislative concepts to each division, which must then subsequently introduce, debate and vote on the proposals through their individual legislative processes. Visit **Legislative actions and issues - NCAA.org** for current legislation and proposals. This resource contains information about legislation that the membership is considering, updates on key issues and new legislation, and links to the key publications that form the agenda for the NCAA Convention.

Guideline 8D

Sport Playing Rules in Student-Athlete Health and Safety

The NCAA sponsors over two dozen sports, and each sport has its own set of playing rules. While most sports' rules are overseen and changed by the NCAA, some rules are maintained by sport governing bodies or organizations external to the NCAA. Almost every set of sport playing rules includes rules with some specific relevance to player health and safety. Members of the athletics health care team should have a working knowledge of rules content, especially for those sports for which a provider has a responsibility to provide medical oversight and care.

Rules related to health and safety generally fall into four categories: inclement weather, injury occurring during competition, protective equipment and performance technology.

Inclement Weather

In outdoor sports, inclement weather and other environmental factors (e.g., darkness) occurring during competition may imperil the safety, well-being and performance of student-athletes. In sports that are uniquely impacted by these factors, playing rules attempt to provide structure and guidance to assist athletics personnel in managing these situations, especially when the factors may create a threat to student-athlete health and safety. For additional information on weather, see **Guidelines 2A: Cold Stress and Cold Exposure**, **2B: Lightning Safety** and **4B: Exertional Heat Illness**.

Protective Equipment

Equipment requirements vary significantly by sport. In some cases, especially for collision and contact sports, sport playing rules establish mandatory pieces of protective equipment to be used during sanctioned competition. In most cases, mandated protective equipment must meet established performance standards in order to be acceptable for NCAA competition. Athletics personnel should be familiar with protective equipment mandates and both the related standards and the standards-setting organizations that promulgate them. Rules associated with other equipment/wearables (e.g., splints, casts, braces) vary by sport and, in some cases, the rules explicitly prohibit their use.

Injury Occurring During Competition

Some sports playing rules address injury scenarios and establish procedures for returning athletes to competition after sustaining an injury when the injury does not require removal from the remainder of the competition (e.g., bleeding that can be controlled). When rules permit an athlete to return-to-play after an injury, those decisions should be made by primary athletics health care provider, who retains autonomous medical management and return-to-play authority as per NCAA legislation. (See **Guideline 1B: Independent Medical Care for College Student-Athletes**.)

Performance Technology

The performance technology industry has evolved rapidly and necessitates ongoing rules modifications in a variety of sports. While some rules codify the mechanisms by which student-athletes with certain health conditions can safely use essential medical technology, other rules serve as guidance for the responsible application of (and in some instances interpretation of data generated by) performance technology. Any performance technology deployed by athletics team personnel (e.g., coaches, strength and conditioning staff) should not be used to make medical decisions for student-athletes; independent, autonomous medical decision-making authority lies with the primary athletics health care provider as outlined by NCAA legislation. (See **Guideline 1B: Independent Medical Care for College Student-Athletes**.)

To assist athletics health care providers in their efforts to familiarize themselves with sports playing rules, this appendix includes an analysis of playing rules of all NCAA-sponsored sports to demonstrate which of the four categories identified above are addressed in the playing rules of that sport. The results of that analysis and links to additional rules resources are in the table that follows.

Lastly, as the scope of this guideline is limited to sport playing rules, it may also be helpful for athletics personnel to review supplementary sources of NCAA health and safety guidance, including but not limited to the other chapters of this handbook, consensus- and expert-based guidance (e.g., **Preventing Catastrophic Injury and Death in Collegiate Athletes**) and additional sport-specific legislation where potential impacts to player health and safety are implied.

Sports Medicine Categories in NCAA Sport Playing Rules

Sport	Rules Resources	Weather	Equipment	Injury During Competition	Performance Technology
Baseball	Baseball Rules of the Game	X	X	X	X
Men's Basketball	Men's Basketball Rules of the Game		X		X
Women's Basketball	Women's Basketball Rules of the Game		X		X
Women's Bowling	Women's Bowling Rules of the Game		X		X
Fencing	Fencing Rules of the Game				
Field Hockey	Field Hockey Rules of the Game	X	X		
Football	Football Rules of the Game	X	X	X	X
Golf	Golf Rules of the Game	X	X		X
Men's and Women's Gymnastics	Gymnastics Rules of the Game		X	X	
Ice Hockey	Ice Hockey Rules of the Game		X	X	X
Men's Lacrosse	Men's Lacrosse Rules of the Game		X	X	
Women's Lacrosse	Women's Lacrosse Rules of the Game	X	X	X	
Rifle	Men's and Women's Rifle Rules of the Game		X		
Rowing	Rules of Rowing	X	X		
Skiing	Skiing Rules of the Game	X	X	X	
Soccer	Soccer Rules of the Game	X	X	X	X
Softball	Softball Rules of the Game	X	X	X	X
Swimming and Diving	Swimming and Diving Rules of the Game	X	X		X
Tennis	Tennis Rules of the Game	X	X		
Track and Field/ Cross Country	Cross Country and Track and Field Rules of Competition	X	X	X	X
Beach Volleyball	Beach Volleyball Rules of the Game	X		X	
Men's Volleyball	Men's Volleyball Rules of the Game			X	
Women's Volleyball	Women's Volleyball Rules of the Game		X	X	
Men's and Women's Water Polo	Water Polo Rules of the Game		X	X	
Men's Wrestling	Wrestling Rules of the Game		X	X	
Women's Wrestling	Available August 2025				

Additional resources for consideration in support of the Sports Medicine Handbook can be found online using the QR code or by visiting **ncaa.org/ssi**. Resources include key publications, educational materials and more.

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