



2011-12 NCAA[®] **Sports Medicine Handbook**





THE NATIONAL COLLEGIATE ATHLETIC ASSOCIATION

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Note: Revisions to the guidelines contained in the NCAA Sports Medicine Handbook may be made on a yearly basis. Between printings of the handbook, revisions will be published on NCAA.org. It is important that persons using this handbook be aware of any such revisions. The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports suggests that such revisions be recorded in the handbook, thereby keeping this publication current. New guidelines and major revisions have been highlighted with orange shading.

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PREFACE

The health and safety principle of the National Collegiate Athletic Association's constitution provides that it is the responsibility of each member institution to protect the health of, and provide a safe environment for, each of its participating student-athletes. To provide guidance in accomplishing this objective and to assist member schools in developing a safe intercollegiate athletics program, the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports creates a Sports Medicine Handbook. The committee has agreed to formulate guidelines for sports medicine care and protection of student-athletes' health and safety for topics relevant to intercollegiate athletics, applicable to a large population of student-athletes, and not accessible in another easily obtainable source.

This handbook consists of guidelines for each institution to consider in developing sports medicine policies appropriate for its intercollegiate athlet-

ics program. In some instances, accompanying best practices, and references to sports medicine or legal resource materials are provided for further guidance. These recommendations are not intended to establish a legal standard of care that must be strictly adhered to by member institutions. In other words, these guidelines are not mandates that an institution is required to follow to avoid legal liability or disciplinary sanctions by the NCAA. However, an institution has a legal duty to use reasonable care in conducting its intercollegiate athletics program, and guidelines may constitute some evidence of the legal standard of care.

These general guidelines are not intended to supersede the exercise of medical judgment in specific situations by a member institution's sports medicine staff. In all instances, determination of the appropriate care and treatment of student-athletes must be based on the clinical judgment of the institution's team physician or ath-

letic health care team that is consistent with sound principles of sports medicine care. These recommendations provide guidance for an institution's athletics administrators and sports medicine staff in protecting student-athletes' health and safety, but do not establish any rigid requirements that must be followed in all cases.

This handbook is produced annually, sent to head athletic trainers, and made available online to directors of athletics, senior woman administrators, faculty athletics representatives, athletic trainers, team physicians, Life Skills coordinators, and student-athlete advisory committees at each member institution, and conference commissioners. Please view the NCAA Sports Medicine Handbook as a tool to help your institution develop its sports medicine administrative policies. Such policies should reflect a commitment to protecting your student-athletes' health and well-being as well as an awareness of the guidelines set forth in this handbook.

2011-12

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FOREWORD

Shared Responsibility for Intercollegiate Sports Safety

Participation in intercollegiate athletics involves unavoidable exposure to an inherent risk of injury. However, student-athletes rightfully assume that those who sponsor intercollegiate athletics have taken reasonable precautions to minimize the risks of injury from athletics participation. In an effort to do so, the NCAA collects injury data in intercollegiate sports. When appropriate, the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports makes recommendations to modify safety guidelines, equipment standards, or a sport's rules of play.

It is important to recognize that rule books, safety guidelines and equipment standards, while helpful means of promoting safe athletics participation, are themselves insufficient to accomplish this goal. To effectively minimize the risks of injury from athletics participation, everyone involved in intercollegiate athletics must understand and respect the intent and objectives of applicable rules, guidelines and standards.

The institution, through its athletics

director, is responsible for establishing a safe environment for its student-athletes to participate in its intercollegiate athletics program.

Coaches should appropriately warn student-athletes about the sport's inherent risks of injury and instruct them how to minimize such risks while participating in games, practices and training.

The team physician and athletic health care team should assume responsibility for developing an appropriate injury prevention program and providing quality sports medicine care to injured student-athletes.

Student-athletes should fully understand and comply with the rules and standard of play that govern their sports and follow established procedures to minimize their risk of injury.

In summary, all persons participating in, or associated with, an institution's intercollegiate athletics program share responsibility for taking steps to reduce effectively the risk of injury during intercollegiate athletic competition.



Administrative issues

Also found on the NCAA website at: NCAA.org/health-safety

NCAA® GUIDELINE 1a

Sports Medicine Administration

October 1977 • Revised July 2011

The following components of a safe athletics program are an important part of injury prevention. They should serve both as a checklist and as a guideline for use by athletics administrators in the development of safe programs.

1. Preparticipation Medical Exam. Before student-athletes accept the rigors of any organized sport, their health should be evaluated by qualified medical personnel. Such an examination should determine whether the student-athlete is medically cleared to engage in a particular sport (see NCAA Bylaw 17.1.5).

Division I requires student-athletes new to their campus to complete a sickle cell solubility test, show results of a prior test, or sign a written release declining the test.

2. Health Insurance. Each student-athlete should be covered by individual, parental or institutional medical insurance to defray the costs of significant injury or illness.

NCAA institutions must certify insurance coverage for medical expenses resulting from athletically related injuries in a covered event (see Bylaw 3.2.4).

3. Preseason Preparation. The student-athlete should be protected from premature exposure to the full rigors of sports. Preseason conditioning should provide the student-athlete with optimal readiness by the first practice (see Guideline 1i, Preseason Preparation).

4. Acceptance of Risk. Any informed consent or waiver by student-athletes (or, if minors, by their parents) should be based on an awareness of the risks of participating in intercollegiate sports.

5. Planning/Supervision. Safety in intercollegiate athletics can be attained only by appropriate planning for and supervision of

practice, competition and travel.

6. Minimizing Potential Legal Liability. Liability must be a concern of responsible athletics administrators and coaches. Those who sponsor and govern athletics programs should accept the responsibility of minimizing the risk of injury.

7. Equitable Medical Care. Member institutions should neither practice nor condone illegal discrimination on the basis of race, creed, national origin, sex, age, disability, social status, financial status, sexual orientation or religious affiliation 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.

Member institutions should not place their sports medicine staffs in compromising situations by having them provide inequitable treatment in violation of their medical codes of ethics.

Institutions should be encouraged to incorporate questions regarding adequacy of medical care, with special emphasis on equitable treatment, in exit interviews with student-athletes.

8. Equipment. Purchasers of equipment should be aware of and use safety standards. In addition, attention should be directed to maintaining proper repair and fitting of equipment at all times in all sports. Student-athletes should:

- a. Be informed what equipment is mandatory and what constitutes illegal equipment;
- b. Be provided the mandated equipment;
- c. Be instructed to wear and how to wear mandatory equipment during participation; and
- d. Be instructed to notify the coaching staff when equipment becomes unsafe or illegal.

9. Facilities. The adequacy and conditions of the facilities used for particular intercollegiate athletics events should not be overlooked, and periodic examination of the facilities should be conducted. Inspection of the facilities should include not only the competitive area, but also warm-up and adjacent areas.

10. 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.

11. Emergency Care. See Guideline 1c.

12. Concussion Management Plan. NCAA member institutions must have a concussion management plan for their student-athletes on file with specific components as described in Bylaw 3.2.4.16 (see Guideline 2i).

13. Drug Testing. NCAA member institutions are responsible for ensuring compliance with NCAA drug testing program requirements (see NCAA Drug Testing Program book and Appendix A).

14. Legislation. NCAA member institutions are responsible for ensuring compliance with the NCAA bylaws relevant to health and safety as outlined in the division manuals (see Appendix B for a quick reference guide).

Medical Evaluations, Immunizations and Records

July 1977 • Revised June 2011

Preparticipation medical evaluation. A preparticipation medical evaluation should be required upon a student-athlete's entrance into the institution's intercollegiate athletics program (see NCAA Bylaw 17.1.5). **Division I requires student-athletes new to their campus to complete a sickle cell solubility test, show results of a prior test, or sign a written release declining the test.** This initial evaluation should include a comprehensive health history, immunization history as defined by current Centers for Disease Control and Prevention (CDC) guidelines and a relevant physical exam, with strong emphasis on the cardiovascular, neurologic and musculoskeletal evaluation. After the initial medical evaluation, an updated history should be performed annually. Further preparticipation physical examinations are not believed to be necessary unless warranted by the updated history or the student-athlete's medical condition.

Cardiac. Sudden cardiac death (SCD) is the leading medical cause of death in NCAA athletes and represents 75 percent of all sudden death cases that occur during training, exercise or competition.

In a five-year review of sudden deaths involving NCAA student-athletes, the incidence of SCD was approximately one in every 40,000 student-athletes per year. The American Heart Association has modified its 1996 recommendation for a cardiovascular screening every two years for collegiate athletes.² The revision³ recommends cardiovascular screening as a part of the physical exam required upon a student-athlete's entrance into the intercollegiate athletics program. In subsequent years, an interim history and blood pressure measurement should be made. Important changes in medical status or abnormalities may require more formal cardiovascular evaluation.

Medical records. Student-athletes have a responsibility to truthfully and fully disclose their medical history and to report any changes in their health to the team's health-care provider. Medical records should be maintained during the student-athlete's collegiate career and should include:

1. A record of injuries, illnesses, new medications or allergies, pregnancies and operations, whether sustained during the competitive season or the

off-season;

2. Referrals for and feedback from consultation, treatment or rehabilitation;

3. Subsequent care and clearances;

4. A comprehensive entry-year health-status questionnaire and an updated health-status questionnaire each year thereafter. Components of the questionnaire should consider recommendations from the American Heart Association (see reference Nos. 2 and 3) and the 4th Edition Preparticipation Physical Evaluation (see reference No. 5).

5. Immunizations. It is recommended that student-athletes be immunized for the following:

- a. Measles, mumps, rubella (MMR);
- b. Hepatitis B;
- c. Diphtheria, tetanus (and boosters when appropriate); and
- d. Meningitis.

6. Written permission, signed annually by the student-athlete, which authorizes the release of medical information to others. Such permission should specify all

Medical Evaluations, Immunizations and Records

persons to whom the student-athlete authorizes the information to be released. The consent form also should specify which information may be released and to whom.

Note: Records maintained in the athletic training facility are medical records, and therefore subject to state and federal laws with regard to confidentiality and content. Each institution should obtain from appropriate legal counsel an opinion regarding the confidentiality and content of such records in its state.

Medical records and the information they contain should be created, maintained and released in accordance with clear written guidelines based on this opinion. All personnel who have access to a student-athlete's medical records should be familiar with such guidelines and informed of their role in maintaining the student-athlete's right to privacy.

Institutions should consider state statutes for medical records retention (e.g., 7 years, 10 years); institutional policy (e.g., insurance long term retention policy); and professional liability statute of limitations.

Follow-up examinations. Those who have sustained a significant injury or illness during the sport season should be given a follow-up examination to re-establish medical clearance before resuming participation in a particular sport. This policy also should apply to pregnant student-athletes after delivery or pregnancy termination. These examinations are especially relevant if the event occurred before the student-athlete left the institution for summer break. Clearance for individuals to return to activity is

solely the responsibility of the team physician or that physician's designated representative.

Medical Hardship Waivers.

Documentation standards should assist conferences and institutions in designing a medical treatment protocol that satisfies all questions of incapacitation and reflects such in the records. To clarify:

- **hardship waiver:** A hardship waiver deals with a student-athlete's seasons of competition and may only be granted if a student-athlete has competed and used one of the four seasons of competition.
- **extension waiver:** An extension waiver deals with time on a student-athlete's eligibility clock and may be granted if, within a student-athlete's period of eligibility (five years or 10 semesters), he or she has been denied more than one participation opportunity for reasons beyond the student-athlete's and the institution's control.

In order to demonstrate that an injury or illness prevented competition and resulted in incapacitation for the remainder of the playing season, an institution needs to provide objective documentation to substantiate the

incapacitation. Three key components need to be included in this documentation:

1. Contemporaneous diagnosis of injury/illness;
2. Acknowledgement that the injury/illness is incapacitating; and
3. Length of incapacitation.

For more information about medical hardship waivers, read the complete article at NCAA.org/health-safety or contact the NCAA's student-athlete reinstatement staff.



Medical Evaluations, Immunizations and Records

Medical Documentation Standards Guidelines (from the NCAA)

Contemporaneous Diagnosis of Injury

- ___ Contemporaneous medical documentation that validates timing of injury or illness (Required)
- ___ Contemporaneous medical documentation that verifies initial severity of injury or illness (demonstrates incapacitation likely results for remainder of season) (Recommended)
- ___ Operation report(s) or surgery report(s) or emergency room document(s) (Recommended)

Acknowledgement that the Injury is Incapacitating

- ___ Contemporaneous letter or diagnosis from treating physician identifying injury or illness as “incapacitating” **OR**
- ___ Non-contemporaneous letter or diagnosis from treating physician identifying injury or illness as “incapacitating” **AND**
- ___ Treatment logs or athletic trainer’s notes (indicating continuing rehabilitation efforts)

Length of Incapacitation (verifying opportunity for injured student-athlete to resume playing within championship season in question is medically precluded)

- ___ Estimated length of incapacitation or recovery time range contained within original contemporaneous medical documentation **AND**
- ___ Contemporaneous documentation of follow-up doctors visits (within the estimated time range) in which student-athlete is not cleared to resume playing **OR**
- ___ Treatment logs or athletic trainer’s notes (indicating continuing rehabilitation efforts)

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NCAA® GUIDELINE 1c

Emergency Care and Coverage

October 1977 • Revised July 2004

Reasonable attention to all possible preventive measures will not eliminate sports injuries. Each scheduled practice or contest of an institution-sponsored intercollegiate athletics event, and all out-of-season practices and skills sessions, should include an emergency plan. Like student-athlete well-being in general, a plan is a shared responsibility of the athletics department; administrators, coaches and medical personnel should all play a role in the establishment of the plan, procurement of resources and understanding of appropriate emergency response procedures by all parties. Components of such a plan should include:

1. The presence of a person qualified and delegated to render emergency care to a stricken participant;
2. The presence or planned access to a physician for prompt medical evaluation of the situation, when warranted;
3. Planned access to early defibrillation;
4. Planned access to a medical facility, including a plan for communication and transportation between the athletics site and the medical facility for prompt medical services, when warranted. Access to a working telephone or other telecommunications device,

whether fixed or mobile, should be assured;

5. All necessary emergency equipment should be at the site or quickly accessible. Equipment should be in good operating condition, and personnel must be trained in advance to use it properly. Additionally, emergency information about the student-athlete should be available both at campus and while traveling for use by medical personnel;
6. An inclement weather policy that includes provisions for decision-making and evacuation plans (See Guideline 1d);
7. A thorough understanding by all parties, including the leadership of visiting teams, of the personnel and procedures associated with the emergency-care plan; and

8. Certification in cardiopulmonary resuscitation techniques (CPR), first aid, and prevention of disease transmission (as outlined by OSHA guidelines) should be required for all athletics personnel associated with practices, competitions, skills instruction, and strength and conditioning. New staff engaged in these activities should comply with these rules within six months of employment. Refer to Appendix B for NCAA Coach Sport Safety legislative requirements.

9. A member of the institution's sports medicine staff should be empowered to have the unchallengeable authority to cancel or modify a workout for health and safety reasons (i.e., environmental changes), as he or she deems appropriate.



Emergency Care and Coverage

Guidelines to Use During a Serious On-Field Player Injury:

These guidelines have been recommended for National Football League (NFL) officials and have been shared with NCAA championships staff.

1. Players and coaches should go to and remain in the bench area once medical assistance arrives. Adequate lines of vision between the medical staffs and all available emergency personnel should be established and maintained.
2. Players, parents and nonauthorized personnel should be kept a significant distance away from the seriously injured player or players.
3. Players or non-medical personnel should not touch, move or roll an injured player.
4. Players should not try to assist a teammate who is lying on the field (i.e., removing the helmet or chin strap, or attempting to assist breathing by elevating the waist).
5. Players should not pull an injured teammate or opponent from a pile-up.
6. Once the medical staff begins to work on an injured player, they should be allowed to perform services without interruption or interference.
7. Players and coaches should avoid dictating medical services to the athletic trainers or team physicians or taking up their time to perform such services.

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Lightning Safety

July 1997 • Revised June 2007

The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Brian L.

Bennett, formerly an athletic trainer with the College of William and Mary Division of Sports Medicine, Ronald L. Holle, a meteorologist, formerly of the National Severe Storms Laboratory (NSSL), and Mary Ann Cooper, M.D., Professor of Emergency Medicine of the University of Illinois at Chicago, in the development of this guideline.

Lightning is the most consistent and significant weather hazard that may affect intercollegiate athletics. Within the United States, the National Oceanic and Atmospheric Administration (NOAA) estimates that 60 to 70 fatalities and about 10 times as many injuries occur from lightning strikes every year. While the probability of being struck by lightning is low, the odds are significantly greater when a storm is in the area and proper safety precautions are not followed.

Education and prevention are the keys to lightning safety. The references associated with this guideline are an excellent educational resource. Prevention should begin long before any intercollegiate athletics event or practice by being proactive and having a lightning safety plan in

place. The following steps are recommended by the NCAA and NOAA to mitigate the lightning hazard:

1. Designate a person to monitor threatening weather and to make the decision to remove a team or individuals from an athletics site or event. A lightning safety plan should include planned instructions for participants and spectators, designation of warning and all clear signals, proper signage, and designation of safer places for shelter from the lightning.

2. Monitor local weather reports each day before any practice or event. Be diligently aware of potential thunderstorms that may form during scheduled intercollegiate athletics events or practices. Weather information can be found through various means via local television news coverage, the Internet, cable and satellite weather programming, or the National Weather Service (NWS) website at www.weather.gov.

3. Be informed of National Weather Service (NWS) issued thunderstorm “watches” or “warnings,” and the warning signs of developing thunderstorms in the area, such as high winds or darkening skies. A “watch” means conditions are favorable for severe weather to develop in an area; a “warning” means that severe

weather has been reported in an area and for everyone to take the proper precautions. A NOAA weather radio is particularly helpful in providing this information.

4. Know where the closest “safer structure or location” is to the field or playing area, and know how long it takes to get to that location. A safer structure or location is defined as:

a. Any building normally occupied or frequently used by people, i.e., a building with plumbing and/or electrical wiring that acts to electrically ground the structure. Avoid using the shower or plumbing facilities and contact with electrical appliances during a thunderstorm.

b. In the absence of a sturdy, frequently inhabited building, any vehicle with a hard metal roof (neither a convertible, nor a golf cart) with the windows shut provides a measure of safety. The hard metal frame and roof, not the rubber tires, are what protects occupants by dissipating lightning current around the vehicle and not through the occupants. It is important not to touch the metal framework of the vehicle. Some athletics events rent school buses as safer shelters to place around open courses or fields.

Lightning Safety

Dangerous Locations

Outside locations increase the risk of being struck by lightning when thunderstorms are in the area. Small covered shelters are not safe from lightning. Dug-outs, rain shelters, golf shelters and picnic shelters, even if they are properly grounded for structural safety, are usually not properly grounded from the effects of lightning and side flashes to people. They are usually very unsafe and may actually increase the risk of lightning injury. Other dangerous locations include areas connected to, or near, light poles, towers and fences that can carry a nearby strike to people. Also dangerous is any location that makes the person the highest point in the area.

5. Lightning awareness should be heightened at the first flash of lightning, clap of thunder, and/or other criteria such as increasing winds or darkening skies, no matter how far away. These types of activities should be treated as a warning or “wake-up call” to intercollegiate athletics personnel. Lightning safety experts suggest that if you hear thunder, begin preparation for evacuation; if you see lightning, consider suspending activities and heading for your designated safer locations.

The following specific lightning safety guidelines have been developed with the assistance of lightning safety experts. Design your lightning safety plan to consider local safety needs, weather patterns and thunderstorm types.

a. As a minimum, lightning safety experts strongly

recommend that by the time the monitor observes 30 seconds between seeing the lightning flash and hearing its associated thunder, all individuals should have left the athletics site and reached a safer structure or location.

b. Please note that thunder may be hard to hear if there is an athletics event going on, particularly in stadia with large crowds. Implement your lightning safety plan accordingly.

c. The existence of blue sky and the absence of rain are not guarantees that lightning will not strike. At least 10 percent of lightning occurs when there is no rainfall and when blue sky is often visible somewhere in the sky, especially with summer thunderstorms. Lightning can, and does, strike as far as 10 (or more) miles away from the rain shaft.

d. Avoid using landline telephones, except in emergency situations. People have been killed while using a landline telephone during a thunderstorm. Cellular or cordless phones are safe alternatives to a landline phone, particularly if the person and the antenna are located within a safer structure or location, and if all other precautions are followed.

e. To resume athletics activities, lightning safety experts recommend waiting 30 minutes after both the last sound of thunder and last flash of lightning. If lightning is seen without hearing thunder, lightning may be out of range and therefore less likely to be a

significant threat. At night, be aware that lightning can be visible at a much greater distance than during the day as clouds are being lit from the inside by lightning. This greater distance may mean that the lightning is no longer a significant threat. At night, use both the sound of thunder and seeing the lightning channel itself to decide on re-setting the 30-minute “return-to-play” clock before resuming outdoor athletics activities.

f. People who have been struck by lightning do not carry an electrical charge. Therefore, cardiopulmonary resuscitation (CPR) is safe for the responder. If possible, an injured person should be moved to a safer location before starting CPR. Lightning-strike victims who show signs of cardiac or respiratory arrest need prompt emergency help. If you are in a 911 community, call for help. Prompt, aggressive CPR has been highly effective for the survival of victims of lightning strikes.

Automatic external defibrillators (AEDs) have become a common, safe and effective means of reviving persons in cardiac arrest. Planned access to early defibrillation should be part of your emergency plan. However, CPR should never be delayed while searching for an AED.

Note: Weather watchers, real-time weather forecasts and commercial weather-warning devices are all tools that can be used to aid in decision-making regarding stoppage of play, evacuation and return to play.

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NCAA® GUIDELINE 1e

Catastrophic Incident in Athletics

July 2004 • Revised July 2008

The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Timothy Neal, ATC, Syracuse University, who originally authored this guideline.

Catastrophes such as death or permanent disability occurring in intercollegiate athletics are rare. However, the aftermath of a catastrophic incident to a student-athlete, coach or staff member can be a time of uncertainty and confusion for an institution. It is recommended that NCAA member institutions develop their own catastrophic incident guideline to provide information and the support necessary to family members, teammates, coaches and staff after a catastrophe. Centralizing and disseminating the information is best served by developing a catastrophic incident guideline. This guideline should be distributed to administrative, sports medicine and coaching staffs within the athletics department. The guideline should be updated and reviewed annually with the entire staff to ensure information is accurate and that new staff

members are aware of the guideline.

Components of a catastrophic incident guideline should include:

1. Definition of a catastrophic incident: The sudden death of a student-athlete, coach or staff member from any cause, or disabling and/or quality of life altering injuries.

2. A management team: A select group of administrators who receive all facts pertaining to the catastrophe. This team works collaboratively to officially communicate information to family members, teammates, coaches, staff, the institution and media. This team may consist of one or more of the following: director of athletics, head athletic trainer, university spokesperson, director of athletic communications and university risk manager. This team may select others to help facilitate fact finding specific to the incident.

3. Immediate action plan: At the moment of the catastrophe, a

checklist of whom to call and immediate steps to secure facts and offer support are items to be included.

4. Chain of command/role delineation: This area outlines each individual's responsibility during the aftermath of the catastrophe. Athletics administrators, university administrators and support services personnel should be involved in this area.

5. Criminal circumstances: Outline the collaboration of the athletics department with university, local and state law enforcement officials in the event of accidental death, homicide or suicide.

6. Away contest responsibilities: Catastrophes may occur at away contests. Indicate who should stay behind with the individual to coordinate communication and act as a university representative until relieved by the institution.

7. Phone list and flow chart: Phone numbers of all key individuals (office, home, cell)

involved in the management of the catastrophe should be listed and kept current. Include university legal counsel numbers and the NCAA catastrophic injury service line number (800/245-2744). A flow chart of who is to be called in the event of a catastrophe is also useful in coordinating communication.

8. Incident Record: A written chronology by the management team of the catastrophic incident is recommended to critique the process and provide a basis for review and enhancement of procedures.

9. Notification Process: After the catastrophic incident, the director of athletics, assistant director of athletics for sports medicine (head athletic trainer), head coach (recruiting coach if available), and university risk manager/legal counsel, as available, will contact the parents/legal guardians/

spouse of the victim. The director of athletics, head coach and others deemed necessary, will inform the team, preferably in person, as soon as possible and offer counseling services and support.

10. Assistance to Visiting Team's Catastrophic Incident as Host Institution: In the event that a visiting team experiences a catastrophic incident, the host institution may offer assistance by alerting the director of athletics or another member of the catastrophic incident management team in order to make as many resources available as possible to the visiting team. The host institution may assist in contacting the victim's institution and athletics administration, as well as activating, as appropriate, the host institution's catastrophic incident guideline to offer support to the visiting team's student-athletes, coaches and staff.

Catastrophic Injury Insurance Program

The NCAA sponsors a catastrophic injury insurance program that covers a student-athlete who is catastrophically injured while participating in a covered intercollegiate athletic activity. The policy has a \$90,000 deductible and provides benefits in excess of any other valid and collectible insurance. The policy will pay \$25,000 if an insured person dies as a result of a covered accident or sustains injury due to a covered accident which, independent of all other causes, results directly in the death of the insured person within twelve (12) months after the date of such injury. Both catastrophic injuries and sudden deaths should be reported to the NCAA national office insurance staff. For more information, visit NCAA.org.

Sample guidelines may be found at NCAA.org/health-safety.

Dr. Fred Mueller at the National Center for Catastrophic Sports Injury Research continues to research catastrophic injuries in sports through funding by the NCAA and the American College Football Coaches Association. The football fatality research and data collection has been done since 1931. The football catastrophic research started in 1977 at the University of North Carolina, Chapel Hill, and the research on fatalities and catastrophic injuries in all other sports was added beginning in 1982. Reports can be found on the NCCSI website at www.unc.edu/depts/nccsi/.

Catastrophic injuries include the following:

1. Fatalities.
2. Permanent disability injuries.
3. Serious injuries (fractured neck or serious head injury) even though the athlete has a full recovery.
4. Temporary or transient paralysis (athlete has no movement for a short time but has a complete recovery).

Please contact Dr. Mueller at the National Center for Catastrophic Sports Injury Research to report an incident at 919/962-5171 or via email at mueller@email.unc.edu.

References

1. Neal, TL: *Catastrophic Incident Guideline Plan*. *NATA News*: 12, May 2003.
2. Neal, TL: *Syracuse University Athletic Department Catastrophic Incident Guideline, 2003*.

NCAA® GUIDELINE 1f

Dispensing Prescription Medication

May 1986 • Revised June 2008

Research sponsored by the NCAA has shown that prescription medications have been provided to student-athletes by individuals other than persons legally authorized to dispense such medications. This is an important concern because the improper dispensing of both prescription and nonprescription drugs can lead to serious medical and legal consequences.

Research also has shown that state and federal regulations regarding packaging, labeling, records keeping and storage of medications have been overlooked or disregarded in the dispensing of medications from the athletic training facility. Moreover, many states have strict regulations regarding packaging, labeling, records keeping and storage of prescription and nonprescription medications. Athletics departments must be concerned about the risk of harm to the student-athletes when these regulations are not followed.

Administering drugs and dispensing drugs are two separate functions. Administration generally refers to the direct application of a single dose of drug. Dispensing is defined as preparing, packaging and labeling a prescription drug or device for subsequent use by a patient. Physicians cannot delegate

to athletic trainers the authority for dispensing prescription medications under current medication-dispensing laws, since athletic trainers are not authorized by law to dispense these drugs under any circumstances. The improper delegation of authority by the physician or the dispensing of prescription medications by the athletic trainer (even with permission of the physician), place both parties at risk for legal liability.

If athletics departments choose to provide prescription and/or nonprescription medications, they

must comply with the applicable state and federal laws for doing so. It is strongly encouraged that athletics departments and their team physicians work with their on-site or area pharmacists to develop specific policies.

The following items form a minimal framework for an appropriate drug-distribution program in a college-athletics environment. Since there is extreme variability in state laws, it is imperative for each institution to consult with legal counsel in order to be in full compliance.

1. Drug-dispensing practices are



Dispensing Prescription Medication

subject to and should be in compliance with all state, federal and Drug Enforcement Agency (DEA) regulations. Relevant items include appropriate packaging, labeling, counseling and education, records keeping, and accountability for all drugs dispensed.

2. Certified athletic trainers should not be assigned duties that may be performed only by physicians or pharmacists. A team physician cannot delegate diagnosis, prescription-drug control or prescription-dispensing duties to athletic trainers.

3. Drug-distribution records should

be created and maintained where dispensing occurs in accordance with appropriate legal guidelines. The record should be current and easily accessible by appropriate medical personnel.

4. All prescription and over-the-counter (OTC) medications should be stored in designated areas that ensure proper environmental (dry with temperatures between 59 and 86 degrees Fahrenheit) and security conditions.

5. All drug stocks should be examined at regular intervals for removal of any outdated, deteriorated or recalled medications.

6. All emergency and travel kits containing prescription and OTC drugs should be routinely inspected for drug quality and security.

7. Individuals receiving medication should be properly informed about what they are taking and how they should take it. Drug allergies, chronic medical conditions and concurrent medication use should be documented in the student-athlete's medical record and readily retrievable.

8. Follow-up should be performed to be sure student-athletes are complying with the drug regimen and to ensure that drug therapy is effective.

References

1. *Adherence to Drug-Dispensation and Drug-Administration Laws and Guidelines in Collegiate Athletic Training Rooms. Journal of Athletic Training*. 38(3): 252-258, 2003.
2. Anderson WA, Albrecht RR, McKeag DB, et al.: *A national survey of alcohol and drug use by college athletes. The Physician and Sportsmedicine* 19:91-104, 1991.
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4. Huff PS: *Drug Distribution in the Training Room. In Clinics in Sports Medicine. Philadelphia, WB Saunders Co: 211-228, 1998.*
5. Huff PS, Prentice WE: *Using Pharmacological Agents in a Rehabilitation Program. In Rehabilitation Techniques in Sports Medicine (3rd Ed.) Dubuque, IA, WCB/McGraw-Hill 244-265, 1998.*
6. Laster-Bradley M, Berger BA: *Evaluation of Drug Distribution Systems in University Athletics Programs: Development of a Model or Optimal Drug Distribution System for Athletics Programs. Unpublished report, 1991. (128 Miller Hall, Department of Pharmacy Care Systems, Auburn University, Auburn, AL 36849-5506)*
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8. *National Athletic Trainers' Association Consensus Statement: Managing Prescriptions and Non-Prescription Medication in the Athletic Training Facility. NATA News. January 2009.*

NCAA® GUIDELINE 1g

Nontherapeutic Drugs

July 1981 • Revised June 2002

The NCAA and professional societies such as the American Medical Association (AMA) and the American College of Sports Medicine (ACSM) denounce the employment of nontherapeutic drugs by student-athletes. These include drugs that are taken in an effort to enhance athletic performance, and those drugs that are used recreationally by student-athletes. Examples include, but are not limited to, alcohol, amphetamines, ephedrine, ma huang, anabolic-androgenic steroids, barbiturates, caffeine, cocaine, heroin, LSD, PCP, marijuana and all forms of tobacco. The use of such drugs is contrary to the rules and ethical principles of athletics competition.

The patterns of drug use and the specific drugs change frequently, and it is incumbent upon NCAA member institutions to keep abreast of current trends. The NCAA conducts drug-use surveys of student-athletes in all sports and across all divisions every four years. According to the 2005 NCAA Study of Substance Use Habits of College Student-Athletes, the percentage of student-athletes who use alcohol decreased by 12 percent (88.9-76.9) during the last 16 years, while the percentage of student-athletes who use marijuana during those same 16 years also decreased (27.5-20.3). Among the entire group of student-athletes, the use of amphetamines has continually increased since

1997. Use of spit tobacco is down in all divisions, but more so in Divisions II and III. Cocaine use is up slightly in all divisions since 2001. The full results of the 2005 and past surveys are available to all member institutions and can be used to educate staff and plan educational and treatment programs for its student-athletes.

The NCAA maintains a banned drug classes list and conducts drug testing at championship events and year-round random testing in sports. Some NCAA member institutions have developed drug-testing programs to combat the use of nontherapeutic substances. Such programs should follow best practice guidelines established by the NCAA Committee on Competitive Safeguards and Medical Aspects of

Sports. While not all member institutions have enacted their own drug-testing programs, it is essential to have some type of drug-education program as outlined in Guideline 1h. Drug testing should not be viewed as a replacement for a solid drug-education program.

All medical staff should be familiar with the regulations regarding dispensing medications as listed in Guideline 1f.

All member institutions, their athletics staff and their student-athletes should be aware of current trends in drug use and abuse, and the current NCAA list of banned drug classes. It is incumbent upon NCAA member institutions to act as a positive influence in order to combat the use of drugs in sport and society.

References

1. American College of Sports Medicine, *Position Stand: The Use of Anabolic-Androgenic Steroids in Sports*, 1984. (P.O. Box 1440, Indianapolis, IN 46206-1440)
2. American Medical Association *Compendium, Policy Statement: Medical and Non-Medical Use of Anabolic-Androgenic Steroids (105.001)*, 1990. (P.O. Box 10946, Chicago, IL 60610)
3. American Medical Association *Compendium, Policy Statement: Non-Therapeutic Use of Pharmacological Agents by Athletes (105.016)*, 1990. (P.O. Box 10946, Chicago, IL 60610)
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NCAA® GUIDELINE 1h

NCAA Alcohol, Tobacco and Other Drug Education Guidelines

August 2000 • Revised June 2003, June 2009, June 2010

NCAA bylaws require that the director of athletics or his or her designee disseminate the list of banned drug classes to all student-athletes and educate them about products that might contain banned drugs. The following provides a framework for member schools to assure they are conducting adequate drug education for all student-athletes. Athletics administrators, coaches and sports medicine personnel should also participate in drug-education sessions. Campus colleagues may provide additional support for your efforts.

In preparation for institution drug-education programs, annually:

- Develop a written policy on alcohol, tobacco and other drugs. This policy should include a statement on recruitment activities, drug testing, disclosure of all medications and supplements, discipline, and counseling or treatment options.
- Review the NCAA, conference and institutional drug-testing

program policies and update handbook materials accordingly.

- Include the NCAA list of banned drug classes and NCAA written policies in the student-athlete handbook.
- Identify NCAA, conference and institutional rules regarding the use of street drugs, performance enhancing substances, and nutritional supplements, and consequences for breaking the rules.
- Display posters and other NCAA educational materials in high-traffic areas.
- Include the following printed warning in the student-athlete handbook:

*Before consuming any nutritional/ dietary supplement product, review the product and its label with your athletics department staff. Dietary supplements are not well regulated and may cause a positive drug test result. Any product containing a dietary supplement ingredient is taken at your own risk.**

Tasks and Timelines for educating student-athletes

By July 1:

- Send out the NCAA list of banned drug classes, the dietary supplement warning and REC* information to all returning student-athletes and known incoming student-athletes.

Orientation at Start of Academic Year:

- Ensure that student-athletes sign NCAA compliance forms.
- Provide student-athletes with a copy of the written drug policies as outlined prior.
- Show NCAA Drug-Education and Testing video.
- Verbally explain all relevant drug policies with student-athletes and staff:
 - NCAA banned drug classes (note that all related compounds under each class are banned, regardless if they

NCAA Alcohol, Tobacco and Other Drug Education Guidelines

are listed as an example.)

- NCAA drug-testing policies and consequences for testing positive, including failure to show or tampering with a urine sample.
- Risks of using nutritional/ dietary supplements – read the dietary-supplement warning.
- NCAA tobacco use ban during practice or competition.
- Conference and institutional drug-testing program policies, if appropriate.
- Street drug use policies and institutional sanctions for violations, if appropriate.

Team Meetings:

- Repeat the information from the orientation at team meetings throughout the year.

Start of Each New Academic Term:

- Repeat the information from the orientation at the start of new academic terms to reinforce messages and to ensure transfer student-athletes are exposed to this information.

NCAA
Play it Safe

- Are you taking supplements or medications?
- Are they safe?
- Will they lead to a positive drug test?
- The REC has ANSWERS**

Call: 877-202-0769 or 816-474-8655

Online: www.drugfreesport.com/rec

Organization: NCAA I, II, or III

Passwords: Division I...*ncaa1*
Division II...*ncaa2*
Division III...*ncaa3*

**The NCAA and REC do not recommend the use of dietary supplements.

REC Drug Free Sport™

NCAA Banned-Drug Classes

- Stimulants
- Anabolic Agents
- Alcohol and Beta Blockers (banned for rifle only)
- Diuretics and other masking agents
- Street drugs
- Peptide hormones and analogues
- Anti-estrogens
- Beta-2 Agonist

Prescribed medications & Over the counter medications

Contact team physician, athletic trainer and utilize the REC Drug Look-up. (If banned you may be eligible for and NCAA Medical Exception)

Supplement Warning

YOU are responsible for any substance you put in your body and the use of any dietary supplement is at your own risk. Dietary supplements may contain banned substances not listed on the label. To help avoid an adverse reaction and positive drug test, please take all supplements to your team physician, athletic trainer and contact the REC BEFORE taking.

www.drugfreesport.com/rec

REC Drug Free Sport™

Throughout the Year:

- Provide additional drug-education opportunities using NCAA resources found at www.NCAA.org/drugtesting.

****For authoritative information on NCAA banned substances, medications and nutritional supplements, contact the Resource Exchange Center (REC) at 877/202-0769 or www.drugfreesport.com/rec (password *ncaa1, ncaa2 or ncaa3*).***

Preseason Preparation

July 2011

Athletic performance training is often divided into separate segments: preparation segment, competitive segment and offseason segment. The NCAA Sports Medicine Handbook Guideline 1a notes that the student-athlete should be protected from premature exposure to the full rigors of sports. Optimal readiness for the first practice and competition is often individualized to the student-athlete rather than a team as a whole. However, there is a lack of scientific evidence to set a specific number of days of sport practice that is needed for the first sport competition.

It is commonly accepted that student-athletes should participate in at least six to eight weeks of preseason conditioning. Gradual progression of type, frequency, intensity, recovery and duration of training should be the focus of the preparation segment. In addition to these areas warranted for progression, 10 to 14 days are needed for heat acclimatization when applicable (see Guideline 2c). The fall sport preseason period is often challenging as August presents added heat risks for sports and there is a lack of time limits for practice activities (with the exception of football).

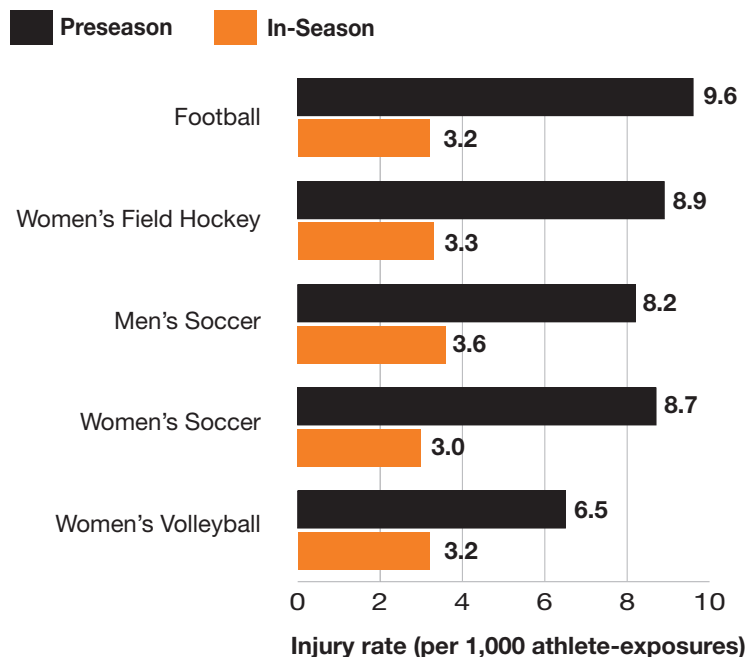
Changes to practice opportunities or the preseason period should be accompanied by an educational campaign for both coaches and student-athletes as to the expectations for the sport season.

Specifically, student-athletes should know that the designated preseason practice period might be considered part of the competitive season and therefore a time when they may practice at contest-level intensities. A shortened preseason period based only on time spent on campus or coach expectations for contest-level intensities during the preparation period often increases the time spent practicing sport-specific skills without ample opportunity for preparatory conditioning exercises and can lead to injury and overtraining. If this is the expectation for the preparatory

on-campus experience, athletes should be encouraged to improve fitness through a progressive training and conditioning program at least four weeks before starting the preseason segment.

The preparatory and preseason phases provide ample 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. In addition, a student-athlete's psychological well-being can be

Practice Injury Rates for Fall Sports (2004-05 to 2008-09 NCAA Injury Surveillance)



Preseason Preparation

directly dependent on the level of fatigue driven by volume (quantity) and intensity of training. Similarly, the incidence in stress-related injuries (e.g., stress fractures, tendinitis) can be proportional to the work-rest ratio of the athlete.

Preparatory Phase. The following are general concepts to consider during the preparatory phase of training:

- Training should be periodized so that variation in the volume and intensity occurs in a scheduled manner.
 - Plan recovery to allow for growth and development while avoiding acute and overtraining injuries.
 - A proper heat acclimatization plan is essential to minimize the risk of exertional heat illness during the fall preseason practice period. Minimizing exertional heat illness risk requires gradually increasing athletes' exposure to the duration and intensity of physical activity and to the environment over a period of 10 to 14 days.
 - Prolonged, near-maximal exertion should be avoided before acquired physical fitness and heat acclimatization are sufficient to support high-intensity, long duration exercise training or competition.
- Fall Preseason Period.** Institutions are encouraged to regularly review their preseason policies for fall sports and consider the following points of emphasis for protecting the health of and providing a safe environment for all student-athletes participating in preseason workout sessions.
- Before participation in any preseason-practice activities, all student-athletes should have completed the medical examination process administered by medical personnel (see Bylaw 17.1.5).
 - Institutions should implement an appropriate rest and recovery plan that includes a hydration strategy.
 - Preseason practice should begin with an acclimatization period for first-time participants, as well as continuing student-athletes.
 - During the acclimatization period, an institution should conduct only one practice per calendar day.
 - Practice sessions should have maximum time limits based on sport and individual needs, as well as environmental factors.
 - An institution should ensure student-athletes have continuous recovery time (e.g., three hours) between multiple practice sessions on the same calendar day.
- Subsequent to the initial acclimatization period, an institution should consider a practice model that promotes recovery if practice sessions are to occur on consecutive days (e.g., two-one-two-one format).
 - Student-athletes should be provided at least one recovery day per week on which no athletics-related activities are scheduled, similar to the regular playing season.
 - Coaches are encouraged to consult with healthcare staff (e.g., athletic trainer) in the development of the conditioning sessions. All personnel should be aware of the impact of exercise intensity and duration, heat acclimatization, hydration, medications and drugs, existing medical conditions, nutritional supplements, and equipment on student-athletes' health while participating in strenuous workouts.
 - Appropriate on-field personnel should review, practice and follow their venue emergency plan, as well as be trained in administering first aid, cardiopulmonary resuscitation (CPR) and AED use.

References

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Preseason Preparation

NCAA Football Preseason Model (see Bylaw 17).

The following concepts outline the legislation involving the NCAA football preseason period. Institutions should refer to division-specific legislation for exact requirements.

Five-Day Acclimatization Period.

In football, preseason practice begins with a five-day acclimatization period for both first-time participants (e.g., freshmen and transfers) and continuing student-athletes. All student-athletes, including walk-ons who arrive to preseason practice after the first day of practice, are required to undergo a five-day acclimatization period. The five-day acclimatization period should be conducted as follows:

- (a) Before participation in any preseason practice activities, all prospects and student-athletes initially entering the intercollegiate athletics program shall be required to undergo a medical examination administered by a physician.
- (b) During the five-day period, participants shall not engage in more than one on-field practice per day, not to exceed three hours in length.
- (c) During the first two days of the acclimatization period, helmets shall be the only piece of protective equipment student-athletes may wear. During the third and fourth days of the acclimatization period, helmets and shoulder pads shall be the only pieces of protective equipment student-athletes may wear. During the final day of the five-day period and on any days thereafter, student-athletes may practice in full pads.

The remaining preseason practice period is conducted as follows:

- (a) After the five-day period, institutions may practice in full pads. However, an institution may not conduct multiple on-field practice sessions (e.g., two-a-days or three-a-days) on consecutive days;
- (b) Student-athletes shall not engage in more than three hours of on-field practice activities on those days during which one practice is permitted;
- (c) Student-athletes shall not engage in more than five hours of on-field practice activities on those days during which more than one practice is permitted; and
- (d) On days that institutions conduct multiple practice sessions, student-athletes must be provided with at least three continuous hours of recovery time between the end of the first practice and the start of the last practice that day. During this time, student-athletes may not attend any meetings or engage in other athletically related activities (e.g., weightlifting); however, time spent receiving medical treatment and eating meals may be included as part of the recovery time.



Medical issues

Also found on the NCAA website at: NCAA.org/health-safety



NCAA® GUIDELINE 2a

Medical Disqualification of the Student-Athlete

January 1979 • Revised June 2004

Withholding a student-athlete from activity. The team physician has the final responsibility to determine when a student-athlete is removed or withheld from participation due to an injury, an illness or pregnancy. In addition, clearance for that individual to return to activity is solely the responsibility of the team physician or that physician's designated representative.

Procedure to medically disqualify a student-athlete during an NCAA championship. As the event sponsor, the NCAA seeks to ensure that all student-athletes are

physically fit to participate in its championships and have valid medical clearance to participate in the competition.

1. The NCAA tournament physician, as designated by the host school, has the unchallengeable authority to determine whether a student-athlete with an injury, illness or other medical condition (e.g., skin infection) may expose others to a significantly enhanced risk of harm and, if so, to disqualify the student-athlete from continued participation.

2. For all other incidents, the

student-athlete's on-site team physician can determine whether a student-athlete with an injury or illness should continue to participate or is disqualified. In the absence of a team physician, the NCAA tournament physician will examine the student-athlete and has valid medical authority to disqualify him or her if the student-athlete's injury, illness or medical condition poses a potentially life threatening risk to himself or herself.

3. The chair of the governing sports committee (or a designated representative) shall be responsible for administrative enforcement of the medical judgment, if it involves disqualification.



References

1. *Team Physician Consensus Statement. Project-based alliance for the advancement of clinical sports medicine composed of the American Academy of Family Physicians, the American Academy of Orthopedic Surgeons, the American College of Sports Medicine (ACSM), the American Medical Society for Sports Medicine, and the American Osteopathic Academy of Sports Medicine, 2000. Contact ACSM at 317/637-9200.*

NCAA® GUIDELINE 2b

Cold Stress and Cold Exposure

June 1994 • Revised June 2002, June 2009

Any individual can lose body heat when exposed to cold air, but when the physically active cannot maintain heat, cold exposure can be uncomfortable, impair performance and may be life-threatening. A person may exhibit cold stress due to environmental or non-environmental factors. The NATA position statement (2008) states that 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.

The variance in the degree, signs and symptoms of cold stress may also be the result of non-environmental factors. These

factors are, but not limited to, previous cold weather injury (CWI), race, geological origin, ambient temperature, use of medications, clothing attire, fatigue, hydration, age, activity, body size/composition, aerobic fitness level, clothing, acclimatization and low caloric intake. Nicotine, alcohol and other drugs may also contribute



Wind Chill Chart



		Temperature (°F)																		
		Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	
	10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	
	15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	
	20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	
	25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	
	30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	
	35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	
	40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	
	45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	
	50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	
	55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	
	60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	

Frostbite Times 30 minutes 10 minutes 5 minutes

Wind Chill (°F) = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})
 Where, T= Air Temperature (°F) V= Wind Speed (mph) Effective 11/01/01

Cold Stress and Cold Exposure

to how the person adapts to the stresses of cold.

Early recognition of cold stress is important. Shivering, a means for the body to generate heat, serves as an early warning sign. Excessive shivering contributes to fatigue and makes performance of motor skills more difficult. Other signs include numbness and pain in fingers and toes or a burning sensation of the ears, nose or exposed flesh. As cold exposure continues, the core temperature drops. When the cold reaches the brain, a victim may exhibit sluggishness, poor judgment and may appear disoriented. Speech becomes slow and slurred, and movements become clumsy. If the participant wants to lie down and rest, the situation is a medical emergency and the emergency action plan should be activated.

Cold injuries can be classified into three categories: freezing or nonfreezing of extremities and hypothermia.

Definitions of Common Cold Injuries in Sports

Frostbite

Frostbite is usually a localized response to a cold, dry environment, but in some incidents, moisture may exacerbate the condition. Frostbite can appear in three distinct phases: frostnip, mild frostbite and deep frostbite.

Frostnip, also known as prefreeze, is a precursor to frostbite and many times occurs when skin is in contact with cold surfaces (e.g., sporting implements or liquid). The most characteristic symptom is a loss of sensation.

Frostbite is the actual freezing of skin or body tissues, usually of the face, ears, fingers and toes, and can occur within minutes. Signs and

symptoms include edema, redness or mottled gray skin, and transient tingling and burning.

Hypothermia

Hypothermia is a significant drop in body temperature [below 95 degrees Fahrenheit (35 degrees Celsius)] as the body's heat loss exceeds its production. The body is unable to maintain a normal core temperature. An individual may exhibit changes in motor function (e.g., clumsiness, loss of finger dexterity, slurred speech), cognition (e.g., confusion, memory loss) and loss of consciousness (e.g., drop in heart rate, stress on the renal system, hyperventilation, sensation of shivering). The signs and symptoms of hypothermia will vary with each individual, depending upon previous cold weather injury (CWI), race, geological origin, ambient temperature, use of medications, clothing attire, fatigue, hydration, age, activity, and others.

Hypothermia can occur at temperatures above freezing. A wet and windy 30- to 50-degree exposure may be as serious as a subzero exposure. As the Wind-Chill Equivalent Index (WCEI) indicates, wind speed interacts with ambient temperature to significantly increase body cooling. When the body and clothing are wet, whether from sweat, rain, snow or immersion, the cooling is even more pronounced due to evaporation of the water held close to the skin by wet clothing.

Chilblain and Immersion (Trench) Foot

Chilblain is a non-freezing cold injury associated with extended cold and wet exposure and results in an exaggerated or inflammatory response. Chilblain may be observed in exposure to cold, wet conditions extending beyond one

hour in endurance and alpine events, and team sports, in which clothing remains wet. The feet and hands are usually affected.

Prevention of Cold Exposure and Cold Stress

Educating all participants in proper prevention is the key to decreasing the possibility of cold exposure injury or illness. Individuals unaccustomed to cold conditions participating at venues that may place them at risk for cold stress may need to take extra precautionary measures (e.g., proper clothing, warm-up routines, nutrition, hydration, sleep).

The sports medicine staff and coaches should identify participants or conditions that may place members of their teams at a greater risk (e.g., predisposing medical conditions, physiological factors, mechanical factors, environmental conditions).

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. Begin with a wicking fabric next to the skin; wicking will not only keep the body warm and dry, but also eliminates the moisture retention of cotton. Polypropylene or wool wick moisture away from the skin and retain insulating properties when wet. Add lightweight pile or wool layers for warmth and use a wind-blocking garment to avoid wind chill. Because heat loss from the head and neck may account for as much as 40 percent of total heat loss, the head and ears should be covered

during cold conditions. Hand coverings should be worn as needed and in extreme conditions, a scarf or facemask should be worn. Mittens are warmer than gloves. Feet can be kept dry by wearing moisture-wicking or wool socks that breathe and should be dried between wears.

Energy/Hydration

Maintain energy levels via the use of meals, energy snacks and carbohydrate/electrolyte sports drinks. Negative energy balance increases the susceptibility to hypothermia. Stay hydrated, since dehydration affects the body's ability to regulate temperature and increases the risk of frostbite. Fluids are as important in the cold as in the heat. Avoid alcohol, caffeine, nicotine and other drugs that cause water loss, vasodilatation or vasoconstriction of skin vessels.

Fatigue/Exhaustion

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

Warm-Up

Warm-up thoroughly and keep warm throughout the practice or competition to prevent a drop in muscle or body temperature. Time the warm-up to lead almost immediately to competition. After competition, add clothing to avoid rapid cooling. Warm extremely cold air with a mask or scarf to prevent bronchospasm.

Partner

Participants should never train alone. An injury or delay in recognizing early cold exposure symptoms could become life-threatening if it occurs during a cold-weather workout on an isolated trail.

Practice and Competition Sessions

The following guidelines, as outlined in the 2008 NATA position statement, can be used in planning activity depending on the wind-chill temperature. Conditions should be constantly re-evaluated for change in risk, including the presence of precipitation:

- 30 degrees Fahrenheit and below: Be aware of the potential for cold injury and notify appropriate personnel of the potential.
- 25 degrees Fahrenheit and below: Provide additional protective clothing; cover as much exposed skin as practical; provide opportunities and facilities for re-warming.
- 15 degrees Fahrenheit and below: Consider modifying activity to limit exposure or to allow more frequent chances to re-warm.
- 0 degrees Fahrenheit and below: Consider terminating or rescheduling activity.

Environmental Conditions

To identify cold stress conditions, regular measurements of environmental conditions are recommended during cold conditions by referring to the Wind-Chill Equivalent Index (WCEI) (revised November 1, 2001). The WCEI is a useful tool to monitor the air temperature index that measures the heat loss from exposed human skin surfaces. Wind chill is the temperature it "feels like" outside, based on the rate of heat loss from exposed skin caused by the effects of the wind and cold. Wind removes heat from the body in addition to the low ambient temperature.

When traveling to areas of adverse weather conditions, the following terms will be consistently referred to in weather forecasting.

Wind Chill

Increased wind speeds accelerate heat loss from exposed skin, and the wind chill is a measure of this effect. No specific rules exist for determining when wind chill becomes dangerous. As a general guideline, the threshold for potentially dangerous wind chill conditions is about minus-20 degrees Fahrenheit.

Wind Chill Advisory

The National Weather Service issues this product when the wind chill could be life threatening if action is not taken. The criteria for this warning vary from state to state.

Wind Chill Factor

Increased wind speeds accelerate heat loss from exposed skin. No specific rules exist for determining when wind chill becomes dangerous. As a general rule, the threshold for potentially dangerous wind chill conditions is about minus-20 degrees Fahrenheit.

Wind Chill Warning

The National Weather Service issues this product when the wind chill is life threatening. The criteria for this warning vary from state to state.

Blizzard Warning

The National Weather Service issues this product for winter storms with sustained or frequent winds of 35 miles per hour or higher with considerable falling and/or blowing snow that frequently reduces visibility to one-quarter of a mile or less.

Cold Stress and Cold Exposure



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Prevention of Heat Illness

June 1975 • Revised June 2002, June 2010

Practice or competition in hot and/or humid environmental conditions poses special problems for student-athletes. Heat stress and resulting heat illness is a primary concern in these conditions. Although deaths from heat illness are rare, exertional heat stroke (EHS) is the third-leading cause of on-the-field sudden death in athletes. There have been more deaths from heat stroke in the last five-year block (2005-2009) than any other five-year block during the past 35 years. Constant surveillance and education are necessary to prevent heat-related problems. The following practices should be observed:

1. An initial complete medical history and physical evaluation, followed by the completion of a yearly health-status questionnaire before practice begins, is required, per Bylaw 17.1.5. A history of previous heat illnesses, sickle cell trait and the type and duration of training activities for the previous month, should also be considered.

2. Prevention of heat illness begins with gradual acclimatization to environmental conditions. Student-athletes should gradually increase exposure to hot and/or humid environmental conditions during a minimum period of 10 to 14 days. Each exposure should involve a gradual increase in the intensity and duration of exercise and equipment worn until the exercise is comparable to

that likely to occur in competition. When environmental conditions are extreme, training or competition should be held during a cooler time of day. Hydration should be maintained during training and acclimatization sessions.

3. Clothing and protective equipment, such as helmets, shoulder pads and shin guards, increase heat stress by interfering with the evaporation of sweat and inhibiting other pathways needed for heat loss. Dark-colored clothing increases the body's absorption of solar radiation, while moisture wicking-type clothing helps with the body's ability to dissipate heat. Frequent rest periods should be scheduled so that the gear and clothing can be removed and/or loosened to allow heat dissipation. During the acclimatization process,

it may be advisable to use a minimum of protective gear and clothing and to practice in T-shirts, shorts, socks and shoes. Rubberized suits should not be worn.

4. To identify heat stress conditions, regular measurements of environmental conditions are recommended. The wet-bulb globe temperature (WBGT), which includes the measurement of wet-bulb temperature (humidity), dry-bulb temperature (ambient temperature) and globe temperature (radiant heat), assesses the potential impact of environmental heat stress. A WBGT higher than 82 degrees Fahrenheit (28 degrees Celsius) suggests that careful control of all activity should be undertaken. Additional precautions should be taken when wearing protective equipment (see reference No. 6).

Intense exercise, hot and humid weather and dehydration can seriously compromise athlete performance and increase the risk of exertional heat injury. Report problems to medical staff immediately.

PROTECT YOURSELF AND YOUR TEAMMATES:

Know the Signs

- Muscle cramping.
- Decreased performance.
- Unsteadiness.
- Confusion.
- Vomiting.
- Irritability.
- Pale or flushed skin.
- Rapid weak pulse.

Report your Symptoms

- High body temperature.
- Nausea.
- Headache.
- Dizziness.
- Unusual fatigue.
- Sweating has stopped.
- Disturbances of vision.
- Fainting.

Prevention of Heat Illness

The American College of Sports Medicine has recently (2007) revised its guidelines for conducting athletic activities in the heat (see reference No. 1).

5. EHS has the greatest potential of occurrence at the start of preseason practices and with the introduction of protective equipment during practice sessions. The inclusion of multiple practice sessions during the same day may also increase the risk of EHS. Ninety-six percent of all heat illnesses in football occur in August.

6. Hydration status also may influence the occurrence of EHS, therefore fluid replacement should be readily available. Student-athletes should be encouraged to drink frequently throughout a practice session. They should drink two cups or more of water and/or sports drink in the hour before practice or competition, and continue drinking during activity (every 15 to 20 minutes). For activities up to two hours in

duration, most weight loss represents water loss, and that fluid loss should be replaced as soon as possible.

After activity, the student-athlete should rehydrate with a volume that exceeds the amount lost during the activity. In general, 16-24 ounces of fluid should be replaced for every pound lost. Urine volume and color can be used to assess general hydration. If output is plentiful and the color is “pale yellow or straw-colored,” the student-athlete is not dehydrated. As the urine color gets darker, this could represent dehydration of the student-athlete. Water and sport drinks are appropriate for hydration and rehydration during exercise in the heat. Sport drinks should contain carbohydrates and electrolytes to enhance fluid consumption. In addition, the carbohydrates provide energy and help maintain immune and cognitive function.

7. During the preseason period or periods of high environmental stress, the student-athletes’ weight should be recorded before and after every work-

out, practice and competition. This procedure can detect progressive dehydration and loss of body fluids. Those who lose five percent of their body weight or more should be evaluated medically and their activity restricted until rehydration has occurred. For prevention, the routine measurement of pre- and post-exercise body weights is useful for determining sweat rates and customizing fluid replacement programs.

8. Some student-athletes may be more susceptible to heat illness. Susceptible individuals include those with: sickle cell trait, inadequate acclimatization or aerobic fitness, excess body fat, a history of heat illness, a febrile condition, inadequate rehydration, and those who regularly push themselves to capacity. Also, substances with a diuretic effect or that act as stimulants may increase risk of heat illness. These substances may be found in some prescription and over-the-counter drugs, nutritional supplements and foods.

Tips for student-athletes and coaches

Stay cool

- ✓ Conduct warm-ups in the shade.
- ✓ Schedule frequent breaks.
- ✓ Break in the shade.
- ✓ Use fans for cooling.
- ✓ Take extra time – at least three hours – between two-a-day practices.
- ✓ Wear light-colored, moisture-wicking, loose-fitting clothing.
- ✓ Increase recovery interval times between exercise bouts and intervals.

Stay hydrated

- ✓ Drink before you are thirsty (20 oz. two to three hours before exercise).
- ✓ Drink early (8 oz. every 15 minutes during exercise).
- ✓ Replace fluids (20 oz. for every pound lost).
- ✓ Lighter urine color is better.
- ✓ Incorporate sports drinks when possible.

Acclimatize

- ✓ Avoid workouts during unusually hot temperatures by picking the right time of day.
- ✓ Progress your exercise time and intensity slowly during a two-week period before preseason.
- ✓ Reduce multiple workout sessions; if multiple sessions are performed, take at least three hours of recovery between them.

Coaches be prepared

- ✓ Use appropriate medical coverage.
- ✓ Have a cell phone on hand.
- ✓ Know your local emergency numbers and program them in your phone.
- ✓ Report problems to medical staff immediately.
- ✓ Schedule breaks for hydration and cooling (e.g., drinks, sponges, towels, tubs, fans).
- ✓ Provide ample recovery time in practice and between practices.
- ✓ Monitor weight loss.
- ✓ Encourage adequate nutrition.

9. Student-athletes should be educated on the signs and symptoms of EHS, such as: elevated core temperature, weakness, cramping, rapid and weak pulse, pale or flushed skin, excessive fatigue, nausea, unsteadiness, disturbance of vision, mental confusion and incoherency. If heat stroke is suspected, prompt emergency treatment is recommended. When training in hot and/or humid conditions, student-athletes should train with a partner or be under observation by a coach or athletic trainer.

First aid for heat illness

Heat exhaustion—Heat exhaustion is a moderate illness characterized by the inability to sustain adequate cardiac output, resulting from strenuous physical exercise and environmental heat stress. Symptoms usually include profound weakness and exhaustion, and often dizziness, syncope, muscle cramps, nausea and a core temperature below 104 degrees Fahrenheit with excessive sweating and flushed appearance. First aid should include removal from activity, taking off all equipment and placing the student-athlete in a cool, shaded environment. Fluids should be given orally. Core temperature and vital signs should be serially assessed. The student-athlete should be cooled by ice immersion and ice towels, and use of IV fluid replacement should be determined by a physician. Although rapid recovery is typical, student-athletes should not be allowed to practice or compete for the remainder of that day.

Exertional Heatstroke—Heatstroke is a medical emergency. Medical care should be obtained at once; a delay in treatment can be fatal. This condition is characterized by a very high body temperature (104 degrees Fahrenheit or greater) and the

POTENTIAL RISK FACTORS

As identified throughout Guideline 2c, the following are potential risk factors associated with heat illness:

- 1. Intensity of exercise.** This is the leading factor that can increase core body temperature higher and faster than any other.
- 2. Environmental conditions.** Heat and humidity combine for a high wet-bulb globe temperature that can quickly raise the heat stress on the body.
- 3. Duration and frequency of exercise.** Minimize multiple practice sessions during the same day and allow at least three hours of recovery between sessions.
- 4. Dehydration.** Fluids should be readily available and consumed to aid in the body's ability to regulate itself and reduce the impact of heat stress.
- 5. Nutritional supplements.** Nutritional supplements may contain stimulants, such as ephedrine, ma huang or high levels of caffeine.* These substances can have a negative impact on hydration levels and/or increase metabolism and heat production. They are of particular concern in people with underlying medical conditions such as sickle cell trait, hypertension, asthma and thyroid dysfunction.
- 6. Medication/drugs.** Certain medications and drugs have similar effects as nutritional supplements. These substances may be ingested through over-the-counter or prescription medications, recreational drugs, or consumed in food. Examples include antihistamines, decongestants, certain asthma medications, Ritalin, diuretics and alcohol.
- 7. Medical conditions.** Examples include illness with fever, gastro-intestinal illness, previous heat illness, obesity or sickle cell trait.
- 8. Acclimatization/fitness level.** Lack of acclimatization to the heat or poor conditioning.
- 9. Clothing.** Dark clothing absorbs heat. Moisture wicking-type material helps dissipate heat.
- 10. Protective equipment.** Helmets, shoulder pads, chest protectors, and thigh and leg pads interfere with sweat evaporation and increase heat retention.
- 11. Limited knowledge of heat illness.** Signs and symptoms can include elevated core temperature, pale or flushed skin, profound weakness, muscle cramping, rapid weak pulse, nausea, dizziness, excessive fatigue, fainting, confusion, visual disturbances and others.

*NOTE: Stimulant drugs such as amphetamines, ecstasy, ephedrine and caffeine are on the NCAA banned substance list and may be known by other names. A complete list of banned drug classes can be found on the NCAA website at NCAA.org/health-safety.

student-athlete likely will still be sweating profusely at the time of collapse, but may have hot, dry skin, which indicates failure of the primary temperature-regulating mechanism (sweating), and CNS dysfunction (e.g., altered consciousness, seizure, coma). First aid includes activation of the emergency action plan, assessment of core temperature/vital signs and

immediate cooling of the body with cold water immersion. Another method for cooling includes using cold, wet ice towels on a rotating basis. Student-athletes who incur heatstroke should be hospitalized and monitored carefully. The NATA's Inter-Association Task Force recommends, "cool first, transport second" in these situations (see reference No. 7).

Prevention of Heat Illness

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Weight Loss— Dehydration

July 1985 • Revised June 2002

There are two general types of weight loss common to student-athletes who participate in intercollegiate sports: loss of body water or loss of body weight (fat and lean tissue). Dehydration, the loss of body water, leads to a state of negative water balance called dehydration. It is brought about by withholding fluids and carbohydrates, the promotion of extensive sweating and the use of emetics, diuretics or laxatives. The problem is most evident in those who must be certified to participate in a given weight class, but it also is present in other athletics groups.

There is no valid reason for subjecting the student-athlete's body to intentional dehydration, which can lead to a variety of adverse physiological effects, including significant pathology and even death. Dehydration in excess of 3 to 5 percent leads to reduced strength and

muscular endurance, reduced plasma and blood volume, compromised cardiac output (elevated heart rate, smaller stroke volume), impaired thermoregulation, decreased kidney blood flow and filtration, reduced liver glycogen stores, and loss of electrolytes. Pathological responses include life-threatening heat illness, rhabdomyolysis (severe muscle breakdown), kidney failure and cardiac arrest.

With extensive dehydration, attempts at acute rehydration usually are insufficient for body fluid and electrolyte homeostasis to be restored before competition. For example, 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 fluid deprivation. To promote sound

practices, student-athletes and coaches should be educated about the physiological and pathological consequences of dehydration. The use of laxatives, emetics and diuretics should be prohibited. Similarly, the use of excessive food and fluid restriction, self-induced vomiting, vapor-impermeable suits (e.g., rubber or rubberized nylon), hot rooms, hot boxes and steam rooms should be prohibited. Excessive food restriction or self-induced vomiting may be symptoms of serious eating disorders (see Guideline 2f).

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, gradual weight loss to achieve the desired weight, and maintenance of the weight during the course of the competitive season. Standard body composition procedures should be used to determine the appropriate competitive weight. Spot checks (body composition or dehydration) should be used to ensure compliance with the weight standard during the season.

Student-athletes and coaches should be informed of the health consequences of dehydration, educated in proper weight-loss procedures, and subject to disciplinary action when approved rules are violated.

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NCAA[®] GUIDELINE 2e

Assessment of Body Composition

June 1991 • Revised June 2002

The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Dr. Dan Benardot, Georgia State University, who authored a revision of this guideline.

Athletic performance is, to a great degree, dependent on the ability of the student-athlete to overcome resistance and to sustain aerobic and/or anaerobic power. Both of these elements of performance have important training and nutritional components and are, to a large degree, influenced by the student-athlete's body composition. 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' body composition often becomes a central theme of training.

Successful student-athletes achieve a body composition that is within a range associated with performance achievement in their specific sport. 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, linemen on



football teams have different responsibilities than receivers, and this difference is manifested in physiques that are also different.

Besides the aesthetic and performance reasons for wanting to achieve an optimal body composition, there may also be safety reasons. A student-athlete who is carrying excess weight may be more prone to injury when performing difficult skills than the student-athlete with a more optimal body composition. However, the means student-athletes often use in an attempt to achieve an optimal body composition may be counterproductive. Diets and excessive training often result in such a severe energy deficit that, while total weight may be reduced, the constituents of weight also change, commonly with a lower muscle mass and a relatively higher fat mass. The resulting higher

body fat percentage and lower muscle mass inevitably results in a performance reduction that motivates the student-athlete to follow regimens that produce even greater energy deficits. This downward energy intake spiral may be the precursor to eating disorders that place the student-athlete at serious health risk. Therefore, while achieving an optimal body composition is useful for high-level athletic performance, the processes student-athletes often use to attain an optimal body composition may reduce athletic performance, may place them at a higher injury risk and may increase health risks.

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

high lean mass to fat mass ratio is often synonymous with a high strength to weight ratio, which is typically associated with athletic success. However, there is no single ideal body composition for all student-athletes in all sports. Each sport has a range of lean mass and fat mass associated with it, and each student-athlete in a sport has an individual range that is ideal for him or her. 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 the establishment of an acceptable range of lean and fat mass for the individual student-athlete, and the monitoring of lean and fat mass over regular time intervals to assure a stability or growth of the lean mass and a proportional maintenance or reduction of the fat mass. 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 the attention traditionally given to body fat percent.

In the absence of published standards for a sport, one strategy for determining if a student-athlete is within the body composition standards for the sport is to obtain a body fat percent value for each student-athlete on a team (using the same method of assessment), and obtaining an average and standard deviation for body fat percent for the 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 greater than or less than ± 1 standard deviation should be evaluated to

determine the appropriateness of their training schedule and nutrient intake. In addition, it is important for coaches and student-athletes to use functional performance measures in determining the appropriateness of a student-athlete's body composition. Student-athletes outside the normal range of body fat percent 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 can be measured indirectly by several methods, including hydrostatic weighing, skinfold and girth measurements (applied to a nomogram or prediction equation), bioelectrical impedance analysis (BIA), dual-energy x-ray absorptiometry (DEXA), ultrasound, computerized tomography, magnetic-resonance imagery, isotope dilution, neutron-activation analysis, potassium-40 counting, and infrared interactance. The most common of the methods now used to assess body composition in student-athletes are skinfold measurements, DEXA, hydrostatic weighing and BIA. While hydrostatic weighing and DEXA are considered by many to be the "gold standards" of the indirect measurement techniques, there are still questions regarding the validity of these techniques when applied to humans. Since skinfold-based prediction equations typically use hydrostatic weighing or DEXA as the criterion methods, results from skinfolds typically carry the prediction errors of the criterion methods plus the added measurement errors associated with obtaining skinfold values. BIA has become popular because of its non-

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Assessment of Body Composition

invasiveness and speed of measurement, but results from this technique are influenced by hydration state. Since student-athletes have hydration states that are in constant flux, BIA results may be misleading unless strict hydration protocols are followed. In general, all of the commonly used techniques should be viewed as providing only estimates of body composition, and since these techniques use different theoretical assumptions in their prediction of body composition, values obtained from one technique should not be compared with values obtained from another technique.

Concerns with Body Composition Assessment

1. Using Weight as a Marker of Body Composition—While the collection of weight data is a necessary adjunct to body composition assessment, by itself weight may be a misleading value. For instance, young student-athletes have the expectation of growth and increasing weight, so gradual increases in weight should not be interpreted as a body composition problem. A student-athlete who has increased resistance training to improve strength may also have a higher weight, but since this increased weight is likely to result from more muscle, this should be viewed as a positive change. The important consideration for weight is that it can be (and often is) misused as a measure of body composition, and this misuse can detract from the purpose of body composition assessment.

2. Comparing Body Composition Values with Other Athletes—Student-athletes often compare

body composition values with other student-athletes, but this comparison is not meaningful and it may drive a student-athlete to change body composition in a way that negatively impacts both performance and health. Health professionals involved in obtaining body composition data should be sensitive to the confidentiality of this information, and explain to each student-athlete that differences in height, age and gender are likely to result in differences in body composition, without necessarily any differences in performance. Strategies for achieving this include:

- Obtaining body composition values with only one student-athlete at a time, to limit the chance that the data will be shared.
- Giving student-athletes information on body composition using phrases such as “within the desirable range” rather than a raw value, such as saying “your body fat level is 18 percent.”
- Providing athletes with information on how they have changed between assessments, rather than offering the current value.
- Increasing the focus on muscle mass, and decreasing the focus on body fat.
- Using body composition values as a means of helping to explain changes in objectively measured performance outcomes.

3. Seeking an Arbitrarily Low Level of Body Fat—Most student-athletes would like their body fat level to be as low as possible. However, student-athletes often try to seek a body fat level that is arbitrarily low and this can increase the frequency of illness, increase the risk of injury, lengthen the time

the student-athlete can return to training after an injury, reduce performance and increase the risk of an eating disorder. Body composition values should be thought of as numbers on a continuum that are usual for a sport. If a student-athlete falls anywhere on that continuum, it is likely that factors other than body composition (training, skills acquisition, etc.) will be the major predictors of performance success.

4. Frequency of Body Composition Assessment

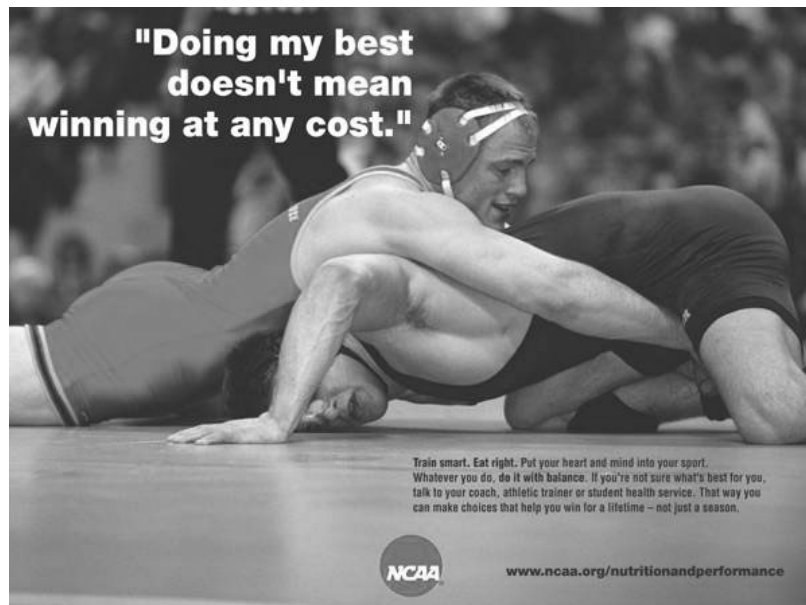
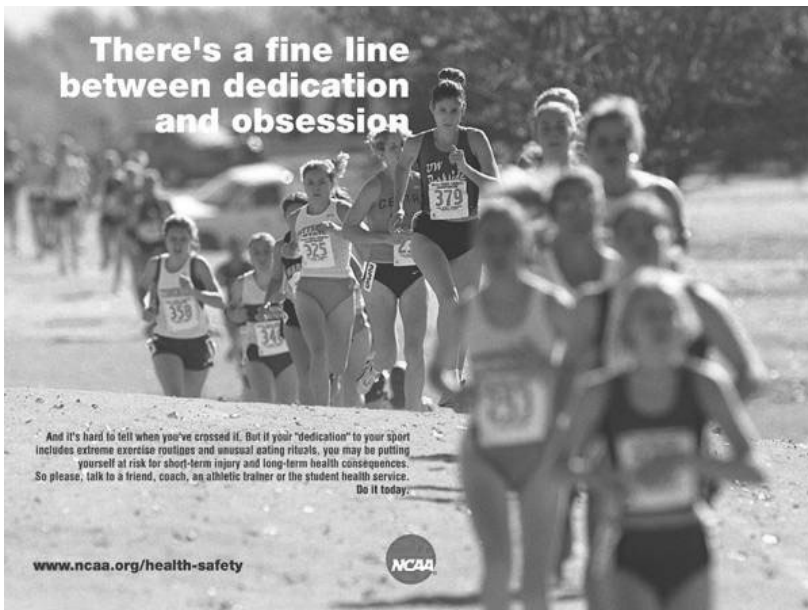
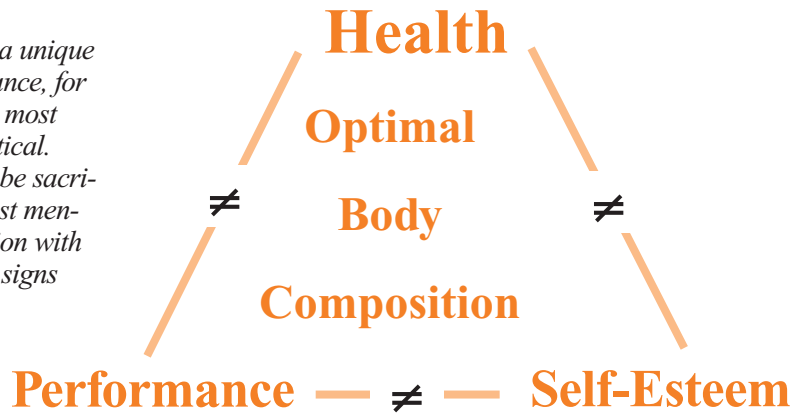
—Student-athletes who have frequent weight and/or skinfolds taken are fearful of the outcome, since the results are often (inappropriately) used punitively. Real changes in body composition occur slowly, so there is little need to assess student-athletes weekly, biweekly or even monthly. If body composition measurements are sufficient and agreed upon by all parties, measurement frequency of twice a year should be sufficient. In some isolated circumstances in which a student-athlete has been injured or is suffering from a disease state, it is reasonable for a physician to recommend a more frequent assessment rate to control for changes in lean mass. Student-athletes and/or coaches who desire more frequent body composition or weight measurement should shift their focus to assessments of objective performance-related measures.

Summary

The assessment of body composition can be a useful tool in helping the student-athlete and coach understand the changes that are occurring as a result of training and nutritional factors. However, the body composition measurement

Assessment of Body Composition

For each student-athlete, there may be a unique optimal body composition for performance, for health and for 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 lost menstrual cycle, sluggishness or an obsession with achieving a number on a scale may be signs that health is being challenged.



Assessment of Body Composition

process and the values obtained can be a sensitive issue for the student-athlete. A legitimate purpose for body composition assessment should dictate the use of these measurement techniques. Health professionals involved in obtaining body composition data should focus on using the same technique with the same prediction equations to derive valid comparative data over time. Institutions should have a protocol in place outlining the rationale for body composition measurements, who is allowed to measure the student-athlete, who is

permitted to discuss the results with the student-athlete and what frequency of body composition measurement is appropriate. The student-athlete should not feel forced or obligated to undergo body composition or weight measurement.

Everyone involved directly or indirectly with body composition measurement should understand that inappropriate measurement and use of body composition data might contribute to the student-athlete experiencing unhealthy emotional

stress. This stress can lead to the development or enhancement of eating disorders in the student-athlete (see Guideline 2f). All coaches (sport or strength/conditioning) should be aware of the sizable influence they may have on the behaviors and actions of their student-athletes. Many student-athletes are sensitive about body fat, so care should be taken to apply body composition measurement, when appropriate, in a way that enhances the student-athlete's well-being.

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Nutrition and Athletic Performance

January 1986 • Revised June 2002, May 2009

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, athletes need to adjust their caloric intake and macronutrient distribution while maintaining a high nutrient-dense diet that supports their training and competition nutrient needs. The following key points summarize the impacts of training on energy, nutrient and fluid recommendations for competitive student-athletes as recommended by the American College of Sports Medicine (ACSM) and the American Dietetic Association (ADA).

It is helpful to think of collegiate athletes' training year as including three phases: base, competition and transition. During base training when training volume is high (practices are longer and/or more frequent), athletes' energy needs are likely to be at their highest. A high-quality nutritional plan is key during this phase. Base training is also the best phase to experiment with and define event fueling and hydration strategies that can be

continued throughout the year.

The competitive phase usually reflects a decrease in training volume, and perhaps higher-intensity training sessions with extended periods of tapering leading up to competition and travel. During the competitive phase, athletes should adjust caloric and macronutrient intake to prevent unwanted weight gain, and learn how to eat before competition and while traveling, and how to adjust fluid needs based on environmental impacts. Athletes who consume a balanced, adequate diet will likely exhibit the best performance, and experience less illness during the competitive phase.

The transition phase, during which athletes' training volume and intensity are likely at their lowest, requires some attention to the prevention of unwanted changes in body weight (increased body fat or decreased muscle mass). During this phase, athletes may need to decrease total caloric intake and resist overindulging while still maintaining a nutrient-dense diet.

Carbohydrate, the primary fuel for higher intensity activity, is required to replenish liver and glycogen stores and to prevent low blood sugar (hypoglycemia) during

training and performance.

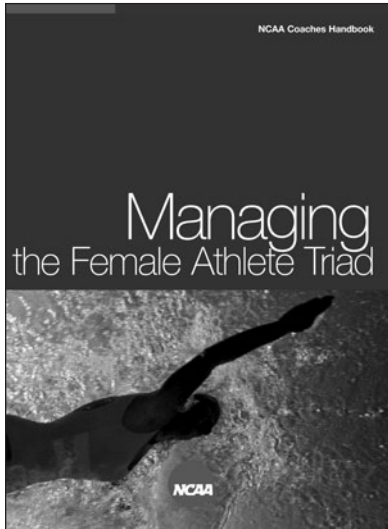
Carbohydrate intake has been well documented to have a positive impact on adaptation to training, performance and improved immune function.

During base training, a daily intake of between 5 to 7 grams of carbohydrate per kilogram of body weight per day is advised. As training intensity and/or volume increase, carbohydrate need may easily exceed 10 grams of carbohydrate per kilogram of body weight. Athletes should begin to think about fueling for their next athletics activity immediately after the one they just completed. Recovery carbohydrate, to replace glycogen stores, can be calculated based on 1 to 1.2 grams of carbohydrate per kilogram of body weight and should be consumed immediately after training sessions



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Nutrition and Athletic Performance



Available online at NCAA.org/health-safety.

longer than 90 minutes or high-intensity, shorter-duration training sessions. Within two hours after training, additional carbohydrate will help continue glycogen repletion.

The U.S. Dietary Guidelines and experts in performance nutrition recommend that athletes focus their food choices on less-refined types of carbohydrate, as these contain essential micronutrients vital to health and performance. Whole grains, breads, pasta, whole fruits and vegetables are excellent sources of high-quality carbohydrate.

Protein requirements are slightly higher in both endurance (1.2 to 1.4 grams per kilogram body weight) and strength-training student-athletes (1.6 to 1.7 grams per kilogram body weight), above the typical recommended daily intake (0.8 grams per kilogram body weight). **Fortunately, the higher intakes recommended for athletes are easily achieved in a well-balanced diet without the use of additional supplements.**

Fat intake is an important source of essential fatty acids and carrier for fat-soluble vitamins necessary for optimal physiological function. During prolonged, lower-intensity training, fats are a major energy contributor and are stored in muscle as triglyceride for use during activity. Dietary intake is suggested to be between 20 to 35 percent of total daily caloric intake. Diets low in fat intake can negatively impact training, nutrient density of the diet and the ability to consistently improve performance.

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.

However, 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. A multivitamin providing not more than 100 percent of the daily recommended intake can be considered for these student-athletes. Female student-athletes are especially prone to deficiencies in calcium and iron due to the impacts of regular menstrual cycles, avoidance of animal products and/or energy restriction. The diets and iron status of endurance athletes and vegetarians (especially females) should be evaluated. However, megadoses of specific vitamins or minerals (10 to 100 times the dose of daily requirements) are not recommended.

Hydration status impacts health and performance. Athletes should consume fluids throughout their day (water, low fat milk, 100 percent fruit juices) and before, during and after training.

Fluids containing electrolytes and carbohydrates are a good source of fuel and re-hydration. Fluids (e.g., energy drinks) containing questionable supplement ingredients and high levels of caffeine or other stimulants may be detrimental to the health of the competitive athlete and are not effective forms of fuel or hydration.

Adequate overall energy intake spread out across the day is important for all student-athletes. Insufficient energy intakes (due to skipped meals or dieting) will have a rapid negative impact on training and performance, and over time, on bone, immune function and injury

risk. Inadequate energy intakes increase fatigue, deplete muscle glycogen stores, increase the risk of dehydration, decrease immune function, increase the risk of injury and result in unwanted loss of muscle mass. A low caloric intake in female student-athletes can lead to menstrual dysfunction and decreased bone mineral density.

The maintenance or attainment of an ideal body weight is sport-specific and represents an important part of a nutritional program. However, student-athletes in certain sports face a difficult paradox in their training/nutrition regimen, particularly those competing in “weight class” sports (e.g., wrestling, rowing), sports that favor those with lower body weight (e.g., distance running, gymnastics), sports requiring student-athletes to wear body contour-revealing clothing (track, diving, swimming, volleyball) and sports with subjective judging related to “aesthetics” (gymnastics, diving). These student-athletes are encouraged to eat to provide the necessary fuel for performance, yet they often face self- or team-imposed weight restrictions. Emphasis on low body weight or low body fat may benefit performance only if the guidelines are realistic, the calorie intake is reasonable and the diet is nutritionally well-balanced.

The use of extreme weight-control measures can jeopardize the health of the student-athlete and possibly trigger behaviors associated with eating disorders. NCAA studies have shown that at least 40 percent of member institutions reported at least one case of anorexia nervosa or bulimia nervosa in their athletics programs. Once identified, these individuals should be referred for medical evaluation and

psychological and nutritional therapy.

A more prevalent issue is the large number of sub-clinical or chronically dieting athletes. Department-wide efforts to educate staff and student-athletes should include addressing the negative impacts of under-fueling and weight/food preoccupation on the athletes’ performance and overall well-being. Although dysfunctional eating is much more prevalent in women (approximately 90 percent of the reports in the NCAA studies were in women’s sports), dysfunctional eating also occurs in men. Female athletes who miss three or more menstrual cycles in a year, are preoccupied with weight, experience rapid changes in body weight, avoid eating with others, or are over-focused on shape and food are exhibiting warning signs worth addressing, if prevention of eating disorders is desired. The medical examination and updated history (Bylaw 17.1.5) is an opportunity to assess athletes for these risk factors and refer them to appropriate professionals for further evaluation and diagnosis.

Eating disorders are often an expression of underlying emotional distress that may have developed long before the individual was involved in athletics. Eating disorders 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

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Nutrition and Athletic Performance

dehydration, resulting in 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 of time. Many student-athletes have performed successfully while experiencing an eating disorder. Therefore, diagnosis of this problem should not be based entirely on a decrease in athletic performance.

Body composition and body weight can affect exercise performance but

should not be used as the main criteria for participation in sports. Decisions regarding weight loss should be based on the following recommendations to reduce the risk of disordered eating.

1. Frequent weigh-ins (either as a team or individually) are discouraged unless part of strategies outlined in Guideline 2c.
2. Weight loss (fat loss) should be addressed during base or transition phases.
3. Weight-loss goals should be determined by the student-athlete and medical and nutritional

personnel, with consultation from the coach.

4. Weight-loss plans should be individualized and realistic.

For each student-athlete, there may be a unique optimal body composition for performance, for health and for 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 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.

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Dietary Supplements

January 1990 • Revised June 2004, June 2009

Nutritional and dietary supplements are marketed to student-athletes to improve performance, recovery time and muscle-building capability. Many student-athletes use nutritional supplements despite the lack of proof of effectiveness. In addition, such substances are expensive and may potentially be harmful to health or performance. Of greater concern is the lack of regulation and safety in the manufacture of dietary supplements. Many compounds obtained from specialty “nutrition” stores and mail-order businesses may not be subject to the strict regulations set by the U.S. Food and Drug Administration. Therefore, the contents of many of these compounds are not represented accurately on the list of ingredients and may contain impurities or banned substances, which may cause a student-athlete to test positive. Positive drug-test appeals based on the claim that the student-athletes did not know the substances they were taking contained banned drugs have not been successful. Student-athletes should be instructed to consult with the institution's sports medicine staff before taking ANY nutritional supplement. Reference NCAA Banned Drug Classes in Appendix A.

Member institutions are restricted in the providing of nutritional supplements – see NCAA bylaws for divisional regulations.

It is well known that a high-carbohydrate diet is associated with improved performance and enhanced ability to train. Carbohydrates in the form of glycogen are the body's main fuel for high-intensity activity. A large number of student-athletes only consume 40 to 50 percent of their total calories from carbohydrates, versus the recommended 55 to 65 percent for most people (about 5 to 10 gm/kg body weight). The lower end of the range should be ingested during regular training; the high end during intense training.

High-carbohydrate foods and beverages can provide the necessary amount of carbohydrate for the high caloric demand of most sports to optimize performance. Low-carbohydrate diets are not advantageous for athletes during intense training and could result in a significantly reduced ability to perform or train by the end of an intense week of training. When the levels of carbohydrate are reduced, exercise intensity and length of activity

decreases, and fatigue rapidly increases. A high-carbohydrate diet consisting of complex carbohydrates, fruits, vegetables, low-fat dairy products and whole grains (along with adequate protein) is the optimal diet for peak performance. (See Guideline 2f, Nutrition and Athletic Performance.)

Protein and amino acid supplements are popular with bodybuilders and strength-training student-athletes. Although protein is needed to repair and build muscles after strenuous training, most studies have shown that student-athletes ingest a sufficient amount without supplements. The recommended amount of protein in the diet should be 12 to 15 percent of total energy intake (about 1.4 to 1.6 gm/kg of body weight) for all types of student-athletes. Although selected amino acid supplements are purported to increase the production of anabolic hormones, studies using manufacturer-recommended amounts have not found increases in growth hormone

The NCAA subscribes to the Resource Exchange Center (REC). The REC (www.drugfreesport.com/rec) provides accurate information on performance-enhancing drugs, dietary supplements, medications, new ingredients and validity of product claims, and whether a substance is banned by the NCAA. This service is provided 24 hours a day via a password-protected website for all NCAA member schools and their student-athletes and athletics personnel. To access the REC, go to www.drugfreesport.com/rec. The password is ncaa1, ncaa2, or ncaa3, depending on your divisional classification.

Dietary Supplements

or muscle mass. Ingesting high amounts of single amino acids is contraindicated because they can affect the absorption of other essential amino acids, produce nausea, and/or impair kidney function and hydration status.

Other commonly advertised supplements are vitamins and minerals. Most scientific evidence shows that selected vitamins and minerals will not enhance performance provided no deficiency exists. Some vitamins and minerals are marketed to student-athletes for other benefits. For example, the antioxidants, vitamins E and C, and beta-carotene, are used by many student-athletes because they believe that these antioxidants will protect them from the damaging effects of aerobic exercise. Although such exercise can cause muscle damage, studies have found that training will increase the body's natural antioxidant defense system so that mega doses of antioxidants may not be needed. Supplementation in high dosages of antioxidants, such as vitamins E and C, and beta-carotene, could disrupt the normal balance of these compounds and the balance of free radicals in the body and cause more harm than good. (American Council on Science and Health)

The mineral chromium has been suggested to increase muscle mass and decrease fat; these claims have little, if any, credible support. In fact, the Federal Trade Commission has declared such claims to be unsubstantiated and deceptive. Similarly, magnesium is purported, but not proven, to prevent cramps. To obtain necessary vitamins and minerals, student-athletes should eat a wide variety of foods because not all vitamins and minerals are found in every food.

Other substances naturally occurring in foods, such as carnitine, herbal extracts and special enzyme formulations, do not provide any benefit to performance. The high-protein diet has received recent attention, but data showing that this diet will enhance performance are weak. High-protein diets are discouraged by most nutrition experts due to increased stress placed on the kidneys. Mild to severe stomach cramping and diarrhea, dehydration, and gout have been

associated with use of certain amino acid supplements. Creatine has been found in some laboratory studies to enhance short-term, high-intensity exercise capability, delay fatigue on repeated bouts of such exercise and increase strength. Several studies have contradicted these claims, and, moreover, the safety of creatine supplements has not been verified. Weight gains of one to three kilograms per week have been found in creatine users, but the cause is unclear.

Many other "high-tech" nutritional



What you don't know can hurt your eligibility

Nutritional/Dietary Supplements

- Are not strictly regulated
- May contain banned substances
- May not list all contents on the label
- May be legal but still contain NCAA banned substances

Consult with your institution's sports medicine staff before taking any nutritional/dietary supplement.

Ignorance is no excuse!



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or dietary supplements may seem to be effective at first, but this is likely a placebo effect — if student-athletes believe these substances will enhance performance, they may train harder or work more efficiently. Ultimately, most nutritional supplements are ineffective, costly and unnecessary.

Student-athletes should be aware that nutritional supplements are not limited to pills and powders; “energy” drinks that contain stimulants are popular. Many of these contain large amounts of either caffeine or other stimulants, both 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, the use of stimulants while exercising can increase the risk of heat illness.

Student-athletes should be provided accurate and sound information on nutritional supplements. It is not worth risking eligibility for products that have not been scientifically proven to improve

performance and may contain banned substances. Member institutions should review NCAA Bylaw 16.5.2, educational columns and interpretations for guidance on restrictions on providing supplements to student-athletes.

Institutions should designate an individual (or individuals) as the athletics department resource for questions related to NCAA banned drugs and the use of nutritional supplements. In addition, institutions should educate athletics department staff members who have regular interaction with student-athletes that the NCAA maintains a list of banned drug classes and provides examples of banned substances in each drug class on the NCAA website; any nutritional supplement use may present risks to a student-athlete’s health and eligibility; and questions regarding NCAA banned drugs and the use of nutritional supplements should be referred to the institution’s designated department resource individual (or individuals). See Appendix B for Division I legislative requirements.

Caution: “Nutritional/dietary supplements may contain NCAA banned substances. The U.S. Food and Drug Administration does not strictly regulate the supplement industry; therefore, purity and safety of nutritional/dietary supplements cannot be guaranteed. Impure supplements may lead to a positive NCAA drug test. The use of supplements is at the student-athlete’s own risk. Student-athletes should contact their institution’s team physician or athletic trainer for further information.”

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“Burners” (Brachial Plexus Injuries)

June 1994 • Revised June 2003

The majority of stingers occur in football. Such injuries have been reported in 52 percent of college football players during a single season. As many as 70 percent of college football players have experienced stingers. Stingers also can occur in a variety of other sports, including basketball, ice hockey, wrestling and some field events in track.

“Burners” or “stingers” are so named because the injuries can cause a sudden pain and numbness along the forearm and hand. The more formal medical terminology is transient brachial plexopathy or an injury to the brachial plexus. A brachial plexus injury may also involve injury to a cervical root. An injury to the spinal cord itself is more serious and frequently does not fall under this category of injury, although it shares certain symptoms; therefore, spinal cord injuries should be ruled out when diagnosing stingers.

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Mechanism

The most common mechanism for stingers is head movement in an opposite direction from the shoulder either from a hit to the head or downward traction of the shoulder. This can stretch the nerve roots on the side receiving the blow (traction), or compress or pinch those

on the opposite side. Contact to the side of the neck may cause a direct contusion to the brachial plexus. In football, improper blocking and tackling techniques may result in a brachial plexus injury. Coaches, parents and student-athletes should be cautioned regarding the consequences of improper techniques, which may result in cervical spine injuries or trauma to the brachial plexus.

Symptoms and Severity

Student-athletes who suffer burners may be unable to move the affected arm from their side and will complain of burning pain, and potentially, numbness traveling from the injured side of the neck through the shoulder down the arm and forearm, and sometimes into the hand. Weakness may be present in the muscles of the shoulder, elbow and hand.

Brachial plexus injuries can be classified into three categories. The mildest form (Grade 1) are neuropraxic injuries that involve demyelination of the axon sheath without intrinsic axonal disruption. Complete recovery typically occurs in a few seconds to days. Grade 1 injuries are the most common in athletics. Grade 2 injuries involve axonotmesis or disruption of the axon and myelin sheath with pres-

“Burners” (Brachial Plexus Injuries)

ervation of the epineurium, perineurium, and endoneurium, which can serve as the conduit for the regenerating axon as it re-grows at 1 to 7 millimeters per day. Weakness can last for weeks but full recovery typically occurs. Grade 3 injuries, neurotmesis or complete nerve transections are rare in athletes. Surgical repair of the nerve is required in these cases and complete recovery may not occur.

These classifications have more meaning with regard to anticipated recovery of function than a grading on the severity of symptoms at the time of initial injury.

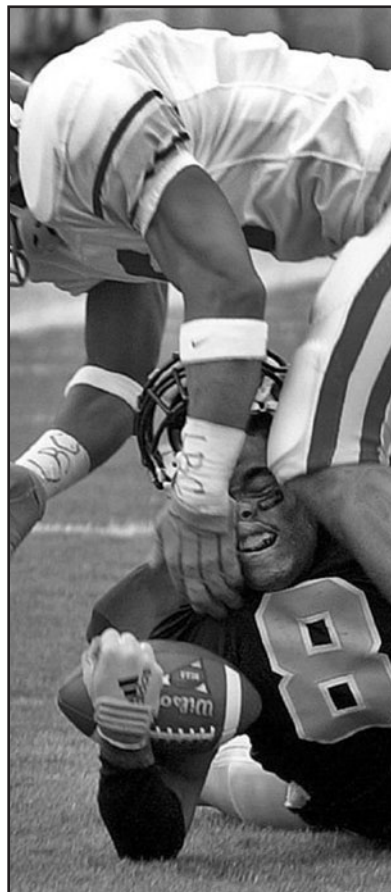
Treatment and Return to Play

Burners and stingers typically result in symptoms that are sensory in nature, frequently involving the C5 and C6 dermatomes. All athletes sustaining burners should be removed from competition and examined thoroughly for injury to the cervical spine and shoulder. All cervical roots should be assessed for motor and sensory function. If symptoms clear within seconds to several minutes and are not associated with any neck pain, limitation of neck movement or signs of shoulder subluxation or dislocation, the athlete can safely return to competition. It is important to re-examine the athlete after the game and for a few successive days to detect any reoccurrence of weakness or alteration in sensory exam.

If sensory complaints or weakness persists for more than a few minutes, a full medical evaluation with radiographs and consideration for a MRI should be done to rule out cervical disk or other compressive pathology. If symptoms persist for more than 2 to 3 weeks, an EMG may be helpful in assessing the

extent of injury. However, an EMG should not be used for return-to-play criteria, as EMG changes may persist for several years after the symptoms have resolved. Shoulder injuries (acromioclavicular separation, shoulder subluxation or dislocation, and clavicular fractures) should be considered in the differential diagnosis of the athlete with transient or prolonged neurologic symptoms of the upper extremity. Any injured athlete who presents with specific cervical-point tenderness, neck stiffness, bony deformity, fear of moving his/her head and/or complains of a heavy head should be immobilized on a spine board (as one would for a cervical spine fracture) and transported to a medical facility for a more thorough evaluation.

Bilateral symptoms indicate that



All athletes sustaining burners or stingers should undergo a physical rehabilitation program that includes neck and trunk strengthening exercises. The fit of shoulder pads should be re-checked and consideration of other athletic protective equipment, such as neck rolls and/or collars, should be given. The athlete's tackling techniques should be reviewed.

“Burners” (Brachial Plexus Injuries)

the cord itself has been traumatized and may suggest transient quadriplegia. These athletes should also be immobilized and transported to a medical facility for a more thorough evaluation.

All athletes sustaining burners or stingers should undergo a physical rehabilitation program that includes neck and trunk strengthening exercises. The fit of shoulder pads should be re-checked and consideration of other athletic protective equipment, such as neck rolls and/or collars, should be given. The athlete's tackling techniques should be reviewed.

Stinger assessment should be part of the student-athletes' preseason physical and mental history (see handbook Guideline No. 1b) so that these “at-risk” athletes can be instructed in a prevention/preventative exercise program and be provided with proper protective equipment.

Recurrent Burners

Recurrent burners may be common; 87 percent of athletes in one study had experienced more than one. Medical personnel should pay special attention to this condition.

Although rare, risk of permanent nerve injury exists for those with recurrent burners. Therefore, participants should report every occurrence to their certified athletic trainers or team physician. Any player with persistent pain, burning, numbness and/or weakness (lasting longer than two minutes) should be held out of competition and referred to a physician for further evaluation.

A Word of Caution

Management of the student-athlete with recurrent burners can be difficult. There are no clear guidelines concerning return to play. Although some risk of permanent nerve injury exists, a review of the literature shows this risk to be small for those with recurrent episodes. The most important concern for student-athletes with recurrent burners is to stress the importance of reporting all symptoms to the attending medical personnel so that a thorough physical examination, with particular attention to strength and sensory changes, can be obtained. Any worsening of symptoms should provoke a more thorough evaluation.

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Concussion or Mild Traumatic Brain Injury (mTBI) in the Athlete

June 1994 • Revised July 2004, 2009, July 2010, July 2011

Estimates suggest that 1.6 to 3.8 million concussions occur from participation in sports- and recreation-related activities every year (see reference No. 18). These injuries are often difficult to detect, with athletes often underreporting their injury, minimizing their importance or not recognizing that an injury has occurred. At the college level, these injuries are more common in certain sports, such as football, ice hockey, men's and women's soccer, and men's lacrosse. However, they also

account for a significant percentage of injuries in men's and women's basketball, women's lacrosse, and other sports traditionally considered "noncontact."

The incidence in helmeted versus nonhelmeted sports is also similar. In the years 2004 to 2009, the rate of concussion during games per 1,000 athlete exposures for football was 3.1, for men's lacrosse 2.6, for men's ice hockey 2.4, for women's ice hockey 2.2, for women's soccer 2.2, for wrestling 1.4, for men's

soccer 1.4, for women's lacrosse 1.2, for field hockey 1.2, for women's basketball 1.2, and for men's basketball 0.6, accounting for between 4 and 16.2 percent of the injuries for these sports as reported by the NCAA Injury Surveillance Program by the Datalys Center.

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 of multiple or severe concussions, including second impact syndrome, postconcussive syndrome, or post-traumatic encephalopathy. Though there is some controversy as to the existence of second impact syndrome, in which a second impact with potentially catastrophic consequences occurs before the full recovery after a first insult, the risks include severe cognitive compromise and death. Other associated injuries that can occur in the setting of concussion include seizures, cervical spine injuries, skull fractures and/or intracranial bleed. Due to the serious nature of mild traumatic brain injury, and these serious potential complications, it is



Concussion or Mild Traumatic Brain Injury

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. In April 2010, the NCAA Executive Committee adopted a policy that requires NCAA institutions to have a concussion management plan on file. (See information box on page 56.)

Concussion or mild traumatic brain injury (mTBI) has been defined as “a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces.” Although concussion most commonly occurs after a direct blow to the head, it can occur after a blow elsewhere that is transmitted to the head. Concussions can be defined by the clinical features, pathophysiological changes and/or biomechanical forces that occur, and these have been described in the literature. The neurochemical and neurometabolic changes that occur in concussive injury have been elucidated, and exciting research is underway describing the genetic factors that may play a role in determining which individuals are at an increased risk for sustaining brain injury.

Most commonly, concussion is characterized by the rapid onset of cognitive impairment that is self limited and spontaneously resolves. The acute symptoms of concussion, listed below, are felt to reflect a functional disturbance in cognitive function instead of structural abnormalities, which is why diagnostic tests such as magnetic resonance imaging (MRI) and computerized tomography (CT) scans are most often normal. These studies may have their role in assessing and evaluating the head-injured athlete whenever there is concern for the associated

injuries of skull fracture, intracranial bleeding and seizures, when there is concern for structural abnormalities or when the symptoms of an athlete persist or deteriorate.

Concussion is associated with clinical scenarios that often clear spontaneously, and may or may not be associated with loss of consciousness (LOC).

The sideline evaluation of the brain-injured athlete should include an assessment of airway, breathing and circulation (ABCs), followed by an assessment of the cervical spine and skull for associated injury. The sideline evaluation should also include a neurological and mental status examination and some form of brief neurocognitive testing to assess memory function and attention. This can be in the form of questions regarding the particular practice or competition, previous game results, and remote and recent memory, and questions to test the athlete’s recall of words, months of the year backwards and calculations. Special note should be made regarding the presence and duration of retrograde or anterograde amnesia, and the presence and duration of confusion. A timeline of injury and the presence of symptoms should be

noted. These sideline tests should be performed and repeated as necessary, but do not take the place of other comprehensive neuropsychological tests.

Once an injury occurs and an initial assessment has been made, it is important to determine an initial plan of action, which includes deciding on whether additional referral to a physician and/or emergency department should take place, and determining the follow-up care. The medical staff should also determine whether additional observation or hospital admission should be considered.

Follow-up care and instructions should be given to the athlete, and ensuring that they are not left alone for an initial period of time should be considered. Athletes should avoid alcohol or other substances that will impair their cognitive function, and also avoid aspirin and other medications that can increase their risk of bleeding.

As mentioned previously, conventional imaging studies such as MRI and CT scans are usually normal in mTBI. However, these studies are considered an adjunct when any structural lesion, such as an intracranial bleed or fracture, is suspected. If an athlete

Table 1
SIGNS AND SYMPTOMS OF mTBI

Loss of consciousness (LOC)	Visual Disturbances
Confusion	(Photophobia, blurry Phono/ photophobia vision, double vision)
Post-traumatic amnesia (PTA)	
Retrograde amnesia (RGA)	
Disorientation	Disequilibrium
Delayed verbal and motor responses	Feeling “in a fog,” “zoned out”
Inability to focus	Vacant stare
Headache	Emotional lability
Nausea/Vomiting	Dizziness
Excessive drowsiness	Slurred/incoherent speech

experiences prolonged loss of consciousness, confusion, seizure activity, focal neurologic deficits or persistent clinical or cognitive symptoms, then additional testing may be indicated.

There are several grading systems and return-to-play guidelines in the literature regarding concussion in sport (AAN, Torg, Cantu). However, there may be limitations because they presume that LOC is associated with more severe injuries. It has been demonstrated that LOC does not correlate with severity of injury in patients presenting to an emergency department with closed head injury, and has also been demonstrated in athletes with concussion (Lovell '99). It has been further demonstrated that retrograde amnesia (RGA), post-traumatic amnesia (PTA), and the duration of confusion and mental status changes are more sensitive indicators of injury severity (Collins '03), thus an athlete with these symptoms should not be allowed to return to play during the same day. These athletes should not return to any participation until cleared by a physician. More recent grading systems have been published that attempt to take into account the expanding research in the field of mTBI in athletes. Though it is useful to become familiar with these guidelines, it is important to remember that many of these injuries are best treated in an

1. NCAA Concussion Fact Sheets and Video for Coaches and Student-Athletes
Available at www.NCAA.org/health-safety.

2. Heads Up: Concussion Tool Kit
CDC. Available at www.cdc.gov/ncipc/tbi/coaches_tool_kit.htm.

3. Heads Up Video
NATA. Streaming online at www.nata.org/consumer/headsup.htm.

individual fashion (Cantu '01, Zurich Conference, NATA '04).

Several recent publications have endorsed the use of neurocognitive or neuropsychological testing as the cornerstone of concussion evaluation. These tests provide a reliable assessment and quantification of brain function by examining brain-behavior relationships. These tests are designed to measure a broad range of cognitive function, including speed of information processing, memory recall, attention and concentration, reaction time, scanning and visual tracking ability, and problem solving ability. Several computerized versions of these tests have also been designed to improve the availability of these tests, and make them easier to distribute and use. Ideally, these tests are performed before the season as a “baseline” with which post-injury tests can be compared. Despite the utility of neuropsychological test batteries in the assessment and treatment of concussion in athletes, several questions remain unanswered. Further research is

needed to understand the complete role of neuropsychological testing.

Given these limitations, it is essential that the medical care team treating athletes continue to rely on its clinical skills in evaluating the head-injured athlete to the best of its ability. It is essential that no athlete be allowed to return to participation when any symptoms persist, either at rest or during exertion. Any athlete exhibiting an injury that involves significant symptoms, long duration of symptoms or difficulties with memory function should not be allowed to return to play during the same day of competition. The duration of time that an athlete should be kept out of physical activity is unclear, and in most instances, individualized return-to-play decisions should be made. These decisions will often depend on the clinical symptoms, previous history of concussion and severity of previous concussions. Additional factors include the sport, position, age, support system for the athlete and the overall “readiness” of the athlete to return to sport.

Once an athlete is completely asymptomatic, the return-to-play progression should occur in a step-wise fashion with gradual increments in physical exertion and risk of contact. After a period of remaining asymptomatic, the first step is an “exertional challenge” in which the athlete exercises for 15 to 20 minutes in an activity such as biking or running in which he/she increases his/her heart rate and

Table 2

SYMPTOMS OF POST-CONCUSSION SYNDROME

Loss of intellectual capacity	Fatigue
Poor recent memory	Irritability
Personality changes	Phono/photophobia
Headaches	Sleep disturbances
Dizziness	Sleep disturbances
Lack of concentration	Depressed mood
Poor attention	Anxiety

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breaks a sweat. If he/she does not experience any symptoms, this can be followed by a steady increase in exertion, followed by return-to-sport-specific activities that do not put the athlete at risk for contact. Examples include dribbling a ball or shooting, stickwork or passing, or other agilities. This allows the athlete to return to the practice setting, albeit in a limited role. Finally, the athlete can be progressed to practice activities with limited contact and finally full contact. How quickly one moves through this progression remains controversial.

The NCAA Executive Committee adopted (April 2010) the following policy for institutions in all three divisions.

“Institutions shall have a concussion management plan on file such that a student-athlete who exhibits signs, symptoms or behaviors consistent with a concussion shall be removed from practice or competition and evaluated by an athletics healthcare provider with experience in the evaluation and management of concussions. Student-athletes diagnosed with a concussion shall not return to activity for the remainder of that day. Medical clearance shall be determined by the team physician or his or her designee according to the concussion management plan.

“In addition, student-athletes must sign a statement in which they accept the responsibility for reporting their injuries and illnesses to the institutional medical staff, including signs and symptoms of concussions. During the review and signing process, student-athletes should be presented with educational material on concussions.”

NCAA Adopted Concussion Management Plan Legislation.

Concussion Management Plan. An active member institution shall have a concussion management plan for its student-athletes. The plan shall include, but is not limited to, the following:

- (a) An annual process that ensures student-athletes are educated about the signs and symptoms of concussions. Student-athletes must acknowledge that they have received information about the signs and symptoms of concussions and that they have a responsibility to report concussion-related injuries and illnesses to a medical staff member;
- (b) A process that ensures a student-athlete who exhibits signs, symptoms or behaviors consistent with a concussion shall be removed from athletics activities (e.g., competition, practice, conditioning sessions) and evaluated by a medical staff member (e.g., sports medicine staff, team physician) with experience in the evaluation and management of concussions;
- (c) A policy that precludes a student-athlete diagnosed with a concussion from returning to athletic activity (e.g., competition, practice, conditioning sessions) for at least the remainder of that calendar day; and
- (d) A policy that requires medical clearance for a student-athlete diagnosed with a concussion to return to athletics activity (for example, competition, practice, conditioning sessions) as determined by a physician (e.g., team physician) or the physician’s designee.

3.2.4.16.1 Effect of Violation. A violation of Constitution 3.2.4.16 shall be considered an institutional violation per Constitution 2.8.1; however, the violation shall not affect the student-athlete’s eligibility.

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In Addition to the Executive Committee Policy Requirements, Additional Best Practices for a Concussion Management Plan Include, but are not Limited to:

1. Although sports currently have rules in place, athletics staff, student-athletes and officials should continue to emphasize that purposeful or flagrant head or neck contact in any sport should not be permitted and current rules of play should be strictly enforced.
2. Institutions should have on file and annually update an emergency action plan for each athletics venue to respond to student-athlete catastrophic injuries and illnesses, including but not limited to, concussions, heat illness, spine injury, cardiac arrest, respiratory distress (e.g., asthma), and sickle cell trait collapses. All athletics healthcare providers and coaches should review and practice the plan at least annually.
3. Institutions should have on file an appropriate healthcare plan that includes equitable access to athletics healthcare providers for each NCAA sport.
4. Athletics healthcare providers should be empowered to have the unchallengeable authority to determine management and return-to-play of any ill or injured student-athlete, as the provider deems appropriate. For example, a countable coach should not serve as the primary supervisor for an athletics healthcare provider, nor should the coach have sole hiring or firing authority over a provider.
5. The concussion management plan should outline the roles of athletics healthcare staff (e.g., physician, certified athletic trainer, nurse practitioner, physician assistant, neurologist, neuropsychologist). In addition, the following components have been specifically identified for the collegiate environment:
 - a. Institutions should ensure that coaches have acknowledged that they understand the concussion management plan, their role within the plan and that they received education about concussions.
 - b. Athletics healthcare providers should practice within the standards as established for their professional practice (e.g., physician, certified athletic trainer, nurse practitioner, physician assistant, neurologist, neuropsychologist).
 - c. Institutions should record a baseline assessment for each student-athlete before the first practice in the sports of baseball, basketball, diving, equestrian, field hockey, football, gymnastics, ice hockey, lacrosse, pole vaulting, rugby, soccer, softball, water polo and wrestling, at a minimum. The same baseline assessment tools should be used post-injury at appropriate time intervals. The baseline assessment should consist of one or more of the following areas of assessment.
 - 1) At a minimum, the baseline assessment should consist of the use of a symptoms checklist and standardized cognitive and balance assessments [e.g., SAC; SCAT; SCAT II; Balance Error Scoring System (BESS)].
 - 2) Additionally, neuropsychological testing (e.g., computerized, standard paper and pencil) has been shown to be effective in the evaluation and management of concussions. The development and implementation of a neuropsychological testing program should be performed in consultation with a neuropsychologist who is in the best position to interpret NP tests by virtue of background and training. However, there may be situations in which neuropsychologists are not available and a physician experienced in the use and interpretation of such testing in an athletic population may perform or interpret NP screening tests.
 - d. The student-athlete should receive serial monitoring for deterioration. Athletes should be provided with written instructions upon discharge, preferably with a roommate, guardian or someone who can follow the instructions.
 - e. The student-athlete should be evaluated by a team physician as outlined within the concussion management plan. Once asymptomatic and post-exertion assessments are within normal baseline limits, return-to-play should follow a medically supervised stepwise process.
6. Institutions should document the incident, evaluation, continued management and clearance of the student-athlete with a concussion.

For references, visit www.NCAA.org/health-safety.

NCAA® GUIDELINE 2j

Skin Infections in Athletics

July 1981 • Revised June 2008

Skin infections may be transmitted by both direct (person to person) and indirect (person to inanimate surface to person) contact. Infection control measures, or measures that seek to prevent the spread of disease, should be used to reduce the risks of disease transmission. Efforts should be made to improve student-athlete hygiene practices, to use recommended procedures for cleaning and disinfection of surfaces, and to handle blood and other bodily fluids appropriately. Suggested measures include: promotion of hand and personal hygiene practices; educating athletes and athletics staff; ensuring recommended procedures for cleaning and disinfection of hard surfaces are followed; and verifying clean up of blood and other potentially infectious materials is done, according to the Occupational Health and Safety Administration (OSHA) Blood-borne Pathogens Standard #29 CFR 1910.1030.

Categories of skin conditions and examples include:

1. Bacterial skin infections
 - a. impetigo;
 - b. erysipelas;
 - c. carbuncle;
 - d. staphylococcal disease, MRSA;
 - e. folliculitis (generalized);
 - f. hidradentitis suppurativa;
2. Parasitic skin infections
 - a. pediculosis;

- b. scabies;
3. Viral skin infections
 - a. herpes simplex;
 - b. herpes zoster (chicken pox);
 - c. molluscum contagiosum; and
4. Fungal skin infections
 - a. tinea corporis (ringworm).

Note: Current knowledge indicates that many fungal infections are easily transmitted by skin-to-skin contact. In most cases, these skin conditions can be covered with a securely attached bandage or nonpermeable dressing to allow participation.

Open wounds and infectious skin conditions that cannot be adequately protected should be considered cause for medical disqualification from practice or competition (see Guideline 2a). The term “adequately protected” means that the wound or skin condition has been deemed as non-infectious and adequately treated as deemed appropriate by a health care provider and is able to be properly covered. The term “properly covered” means that the skin infection is covered by a securely attached bandage or dressing that will contain all drainage and will remain intact throughout the sport activity. A health care provider might exclude a student-athlete if the activity poses a risk to the health of the infected athlete (such as injury to the infected area), even though the infection can be properly covered. If wounds can be properly covered, good hygiene measures such

as performing hand hygiene before and after changing bandages and throwing used bandages in the trash should be stressed to the athlete.

Antibiotic Resistant Staph Infections

There is much concern about the presence and spread of antibiotic-resistant *Staphylococcus aureus* in intercollegiate athletics across sports. Athletes are at-risk due to presence of open wounds, poor hygiene practices, close physical contact, and the sharing of towels and equipment. Institutions and conferences should continue efforts and support for the education of staff and student-athletes on the importance of proper hygiene and wound care to prevent skin infections from developing and infectious diseases from being transmitted.

Staphylococcus aureus, often referred to as “staph,” are bacteria commonly carried on the skin or in the nose of healthy people. Occasionally, staph can cause an infection. Staph bacteria are one of most common causes of skin infections in the U.S. Most infections are minor, typically presenting as skin and soft tissue infections (SSTI) such as pimples, pustules and boils. They may be red, swollen, warm, painful or purulent. Sometimes, athletes confuse these lesions with insect bites in the early stages of infection. A purulent lesion could present as draining pus; yellow or white center; central point or “head”; or a palpable fluid-filled cavity.

Skin Infections in Athletics

In the past, most serious staph bacterial infections were treated with antibiotics related to penicillin. In recent years, antibiotic treatment of these infections has changed because staph bacteria have become resistant to various antibiotics, including the commonly used penicillin-related antibiotics. These resistant bacteria are called methicillin-resistant *Staphylococcus aureus*, or MRSA. Fortunately, the first-line treatment for most purulent staph, including MRSA, skin and soft tissue infections is incision and drainage with or without antibiotics. However, if antibiotics are prescribed, patients should complete

the full course and consult physicians if the infection does not get better. The Centers for Disease Control and Prevention (CDC), American Medical Association (AMA), and Infectious Diseases Society of America (IDSA) have developed a treatment algorithm that should be reviewed; it is accessible at www.cdc.gov/ncidod/dhqp/ar_mrsa_ca_skin.html.

Staph bacteria including MRSA can spread among people having close contact with infected people. MRSA is almost always spread by direct physical contact, and not through the air. Spread may also occur through

indirect contact by touching objects contaminated by the infected skin of a person with MRSA or staph bacteria (e.g. towels, sheets, wound dressings, clothes, workout areas, sports equipment).

If a lesion cannot be properly covered for the rigors of the sport, consider excluding players with potentially infectious skin lesions from practice and competition until lesions are healed.

Staph bacteria including MRSA can be found on the skin and in the nose of some people without causing illness. The role of decolonization is still under investigation. Regimens

Some common recommendations include:

A. Keep hands clean by washing thoroughly with soap and warm water or using an alcohol-based sanitizer routinely

B. Encourage good hygiene

- immediate showering after activity
- ensure availability of adequate soap and water
- pump soap dispensers are preferred over bar soap

C. Avoid whirlpools or common tubs

- individuals with active infections, open wounds, scrapes or scratches could infect others or become infected in this environment

D. Avoid sharing towels, razors, and daily athletic gear

- avoid contact with other people's wounds or material contaminated from wounds

E. Maintain clean facilities and equipment

- wash athletic gear and towels after each use
- establish routine cleaning schedules for shared equipment

F. Inform or refer to appropriate health care personnel for all active skin lesions and lesions that do not respond to initial therapy

- train student-athletes and coaches to recognize potentially infected wounds and seek first aid
- encourage coaches and sports medicine staff to assess regularly for skin lesions
- encourage health care personnel to seek bacterial cultures to establish a diagnosis

G. Care and cover skin lesions appropriately before participation

- keep properly covered with a proper dressing until healed
- "properly covered" means that the skin infection is covered by a securely attached bandage or dressing that will contain all drainage and will remain intact throughout the sport activity
- if wounds can be properly covered, good hygiene measures should be stressed to the student-athlete such as performing hand hygiene before and after changing bandages and throwing used bandages in the trash
- if wound cannot be properly covered, consider excluding players with potentially infectious skin lesions from practice and/or competition until lesions are healed or can be covered adequately

Skin Infections in Athletics

intended to eliminate MRSA colonization should not be used in patients with active infections. Decolonization regimens may have a role in preventing recurrent infections, but more data are needed to establish their efficacy and to identify optimal regimens for use in community settings. After treating active infections and reinforcing hygiene and appropriate wound care, consider consultation with an infectious disease specialist regarding use of decolonization when there are recurrent infections in an individual patient or members of a defined group.

MRSA infections in the community are typically SSTI, but can also cause severe illness such as pneumonia. Most transmissions appear to be from people with active MRSA skin infections. Staph and MRSA infections are not routinely reported to public health authorities, so a precise number is not known. It is estimated that as many as 300,000 hospitalizations are related to MRSA infections each year. Only a small proportion of these have disease onset occurring in the community. It has also been estimated that there are more than 12 million outpatient (i.e., physician offices, emergency and outpatient departments) visits for suspected staph and MRSA SSTIs in the U.S. each year. Approximately 25 to 30 percent (80 million persons) of the population is colonized in the nose with staph bacteria at a given time and approximately 1.5 percent (4.1 million persons) is colonized with MRSA.

In an effort to educate the public about the potential risks of MRSA, organizations such as the CDC, NCAA and the National Athletic Trainers' Association (NATA) have issued official statements recommending all health care personnel and physically active adults and children take appropriate

precautions if suspicious skin infections appear, and immediately contact their health care provider.

Individual cases of MRSA usually are not required to be reported to most local/state health departments; however, most states have laws that require reporting of certain communicable diseases, including outbreaks regardless of pathogens. So in most states if an outbreak of skin infections is detected, the local and/or state health department should be contacted.

Recognition of MRSA is critical to clinical management. Education is the key, involving all individuals associated with athletics, from student-athletes to coaches to medical personnel to custodial staff. Education should encompass proper hygiene, prevention techniques and appropriate precautions if suspicious wounds appear. Each institution should develop prevention strategies and infection control policies and procedures.



WHEN IN DOUBT, CHECK IT OUT.

Report skin infections

to your athletic trainer, coach or team physician.

Recognize the signs of infections:
skin sores/lesions that have redness, pain, swelling or pus.

Don't treat yourself.



Skin Infections in Athletics

Skin Infections in Wrestling

Data from the NCAA Injury Surveillance Program indicate that skin infections are associated with at least 17 percent of the practice time-loss injuries in wrestling.

It is recommended that qualified personnel, including a knowledgeable, experienced physician, examine the skin of all wrestlers before any participation (practice and competition). Male student-athletes shall wear shorts and female student-athletes should wear shorts and a sports bra during medical examinations.

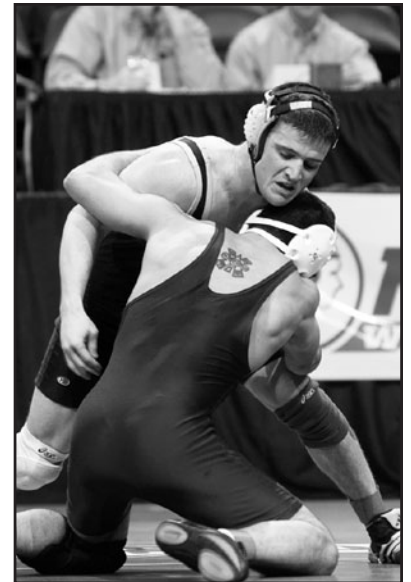
Open wounds and infectious skin conditions that cannot be adequately protected should be considered cause for medical disqualification from practice or competition (see Guideline 2a). The term “adequately protected” means that the wound or skin condition has been deemed as non-infectious and adequately treated as deemed appropriate by a health care provider and is able to be properly covered. The term “properly covered” means that the skin infection is covered by a securely attached bandage or dressing that will contain all drainage and will

remain intact throughout the sport activity. A health care provider might exclude a student-athlete if the activity poses a risk to the health of the infected athlete (such as injury to the infected area), even though the infection can be properly covered. If wounds can be properly covered, good hygiene measures such as performing hand hygiene before and after changing bandages and throwing used bandages in the trash should be stressed to the athlete. (See Wrestling Rule WA-15.)

Medical Examinations

Medical examinations must be conducted by knowledgeable physicians and/or certified athletic trainers. The presence of an experienced dermatologist is recommended. The examination should be conducted in a systematic fashion so that more than one examiner can evaluate problem cases. Provisions should be made for appropriate lighting and the necessary facilities to confirm and diagnose skin infections.

Wrestlers who are undergoing treatment for a communicable skin disease at the time of the meet or tournament shall provide written documentation to that effect from a physician. The



status of these individuals should be decided before the screening of the entire group. The decision made by a physician and/or certified athletic trainer “on site” should be considered FINAL.

Guidelines for Disposition of Skin Infections

Unless a new diagnosis occurs at the time of the medical examination conducted at the meet or tournament, the wrestler presenting with a skin lesion shall provide a completed Skin

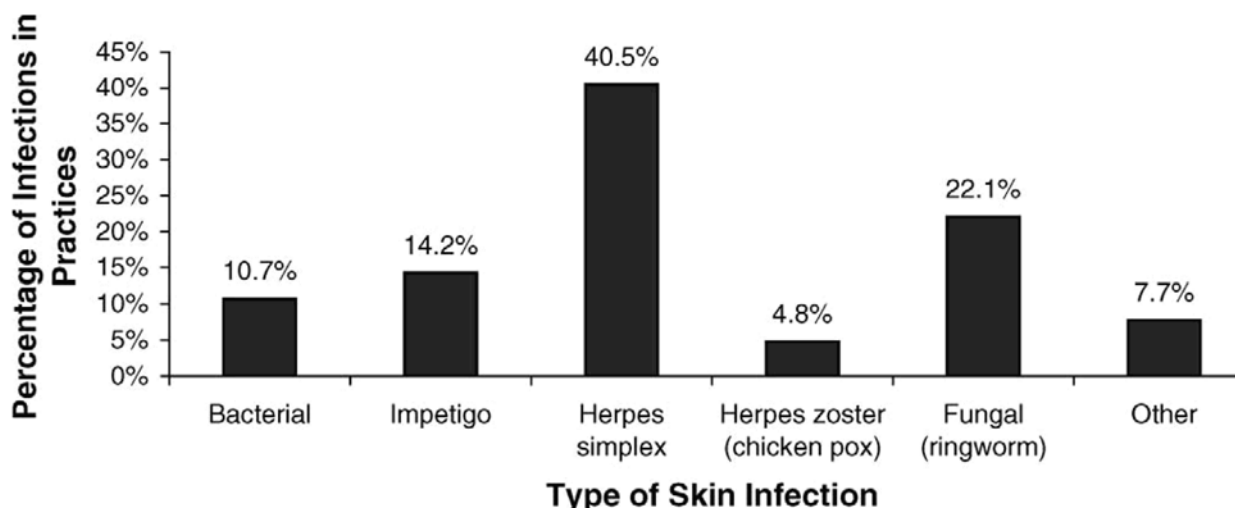


Figure 3. Skin infections in practices, men’s wrestling, 1993–1994 through 2003–2004 (n = 1151).

Evaluation and Participation Status Form from the team physician documenting clinical diagnosis, lab and/or culture results, if relevant, and an outline of treatment to date (i.e., surgical intervention, duration, frequency, dosages of medication).

BACTERIAL INFECTIONS

(Furuncles, Carbuncles, Folliculitis, Impetigo, Cellulitis or Erysipelas, Staphylococcal disease, MRSA)

1. Wrestler must have been without any new skin lesion for 48 hours before the meet or tournament.
2. Wrestler must have no moist, exudative or purulent lesions at meet or tournament time.
3. Gram stain of exudate from questionable lesions (if available).
4. Active purulent lesions shall not be covered to allow participation. See above criteria when making decisions for participation status.

HIDRADENITIS SUPPURATIVA

1. Wrestler will be disqualified if extensive or purulent draining lesions are present.
2. Extensive or purulent draining lesions shall not be covered to allow participation.

PEDICULOSIS

Wrestler must be treated with appropriate pediculicide and re-examined for completeness of response before wrestling.

SCABIES

Wrestler must have negative scabies prep at meet or tournament time.

HERPES SIMPLEX

Primary Infection

1. Wrestler must be free of systemic symptoms of viral infection (fever, malaise, etc.).
2. Wrestler must have developed no

new blisters for 72 hours before the examination.

3. Wrestler must have no moist lesions; all lesions must be dried and surmounted by a FIRM ADHERENT CRUST.
4. Wrestler must have been on appropriate dosage of systemic antiviral therapy for at least 120 hours before and at the time of the meet or tournament.
5. Active herpetic infections shall not be covered to allow participation.

See above criteria when making decisions for participation status.

Recurrent Infection

1. Blisters must be completely dry and covered by a FIRM ADHERENT CRUST at time of competition, or wrestler shall not participate.
2. Wrestler must have been on appropriate dosage of systemic antiviral therapy for at least 120 hours before and at the time of the meet or tournament.
3. Active herpetic infections shall not be covered to allow participation.

See above criteria when making decisions for participation status.

Questionable Cases

1. Tzanck prep and/or HSV antigen assay (if available).
2. Wrestler's status deferred until Tzanck prep and/or HSV assay results complete.

Wrestlers with a history of recurrent herpes labialis or herpes gladiatorum could be considered for season-long prophylaxis. This decision should be made after consultation with the team physician.

HERPES ZOSTER (chicken pox)

Skin lesions must be surmounted by a FIRM ADHERENT CRUST at meet

or tournament time and have no evidence of secondary bacterial infection.

MOLLUSCUM CONTAGIOSUM

1. Lesions must be curetted or removed before the meet or tournament.
2. Solitary or localized, clustered lesions can be covered with a gaspermeable membrane, followed by tape.

VERRUCAE

1. Wrestlers with multiple digitate verrucae of their face will be disqualified if the infected areas cannot be covered with a mask. Solitary or scattered lesions can be curetted away before the meet or tournament.
2. Wrestlers with multiple verrucae plana or verrucae vulgaris must have the lesions "adequately covered."

TINEA INFECTIONS (ringworm)

1. A minimum of 72 hours of topical therapy is required for skin lesions.
2. A minimum of two weeks of systemic antifungal therapy is required for scalp lesions.
3. Wrestlers with extensive and active lesions will be disqualified. Activity of treated lesions can be judged either by use of KOH preparation or a review of therapeutic regimen. Wrestlers with solitary, or closely clustered, localized lesions will be disqualified if lesions are in a body location that cannot be "properly covered."
4. The disposition of tinea cases will be decided on an individual basis as determined by the examining physician and/or certified athletic trainer.

Skin Infections in Athletics

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National Collegiate Athletic Association

SKIN EVALUATION AND PARTICIPATION STATUS
(Physician Release for Student-Athlete to Participate with Skin Lesion)

Student-Athlete: _____

Date of Exam: ____ / ____ / ____

Institution: _____

Please Mark Location of Lesion(s):

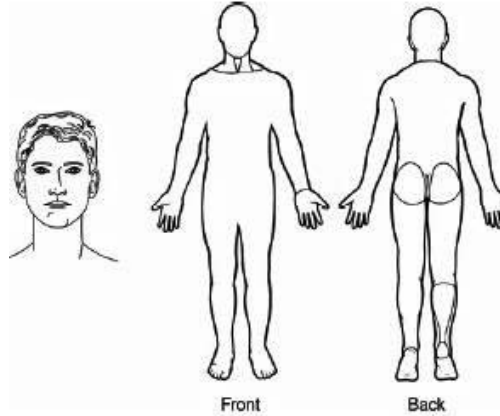
Dual(s)/Tournament: _____

Number of Lesion(s): _____

Cultured: No Yes _____

Diagnosis: _____

Medication(s) used to treat lesion(s): _____



Date Treatment Started: ____ / ____ / ____ Time: _____

Earliest Date student-athlete may return to participation: ____ / ____ / ____

Physician Name (Printed): _____

Physician Signature: _____
(M.D. or D.O.)

Specialty: _____

Office Address: _____

Contact #: _____

Institution Certified Athletic Trainer Notified: No Yes Signature: _____

Note to Physicians: Non-contagious lesions do not require treatment prior to return to participation (e.g. eczema, psoriasis, etc.). Please familiarize yourself with NCAA Wrestling Rules which state: (refer to the NCAA Wrestling Rules and Interpretations publication for complete information)

"9.6.4 ... The presence of a communicable skin disease ... shall be full and sufficient reason for disqualification."

"9.6.5 ... If a student-athlete has been diagnosed as having such a condition, and is currently being treated by a physician (ideally a dermatologist) who has determined that it is safe for that individual to compete without jeopardizing the health of the opponent, the student-athlete may compete. However, the student-athlete or his/her coach or athletic trainer shall provide current written documentation from the treating physician to the medical professional at the medical examination, ..."

"9.6.6 ... Final determination of the participant's ability to compete shall be made by the host site's physician or certified athletic trainer who conducts the medical examination after review of any such documentation and the completion of the exam."

Below are some treatment guidelines that suggest **MINIMUM TREATMENT** before return to wrestling: (please refer to the NCAA Sports Medicine Handbook for complete information)

Bacterial Infections (Furuncles, Carbuncles, Folliculitis, Impetigo, Cellulitis or Erysipelas, Staphylococcal disease, CA-MRSA): Wrestler must have been without any new skin lesion for 48 hours before the meet or tournament; completed 72 hours of antibiotic therapy and have no moist, exudative or draining lesions at meet or tournament time. Gram stain of exudate from questionable lesions (if available). Active bacterial infections shall not be covered to allow participation.

Herpetic Lesions (Simplex, fever blisters/cold sores, Zoster, Gladiatorum): Skin lesions must be surmounted by a FIRM ADHERENT CRUST at competition time, and have no evidence of secondary bacterial infection. For primary (first episode of Herpes Gladiatorum) infection, the wrestler must have developed no new blisters for 72 hours before the examination; be free of signs and symptoms like fever, malaise, and swollen lymph nodes; and have been on appropriate dosage of systemic antiviral therapy for at least 120 hours before and at the time of the competition. Recurrent outbreaks require a minimum of 120 hours of oral anti-viral treatment, again so long as no new lesions have developed and all lesions are scabbed over. Active herpetic infections shall not be covered to allow participation.

Tinea Lesions (ringworm): Oral or topical treatment for 72 hours on skin and 14 days on scalp. Wrestlers with solitary, or closely clustered, localized lesions will be disqualified if lesions are in a body location that cannot be adequately covered.

Molluscum Contagiosum: Lesions must be curetted or removed before the meet or tournament and covered.

Verrucae: Wrestlers with multiple digitate verrucae of their face will be disqualified if the infected areas cannot be covered with a mask. Solitary or scattered lesions can be curetted away before the meet or tournament. Wrestlers with multiple verrucae plana or verrucae vulgaris must have the lesions adequately covered.

Hidradenitis Suppurativa: Wrestler will be disqualified if extensive or purulent draining lesions are present; covering is not permissible.

Pediculosis: Wrestler must be treated with appropriate pediculicide and re-examined for completeness of response before wrestling.

Scabies: Wrestler must have negative scabies prep at meet or tournament time.

DISCLAIMER: The National Collegiate Athletic Association shall not be liable or responsible, in any way, for any diagnosis or other evaluation made herein, or exam performed in connection therewith, by the above named physician/provider, or for any subsequent action taken, in whole or in part, in reliance upon the accuracy or veracity of the information provided herein.

Menstrual-Cycle Dysfunction

January 1986 • Revised June 2002

The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Dr. Anne Loucks, Ohio University, in the revision of this guideline.

In 80 percent of college-age women, the length of the menstrual cycle ranges from 23 to 35 days.

Oligomenorrhea refers to a menstrual cycle that occurs inconsistently, irregularly and at longer intervals. Amenorrhea is the cessation of the menstrual cycle with ovulation occurring infrequently or not at all. A serious medical problem of amenorrhea is the lower level of circulating estrogen (hypoestrogenism), and its potential health consequences.

The prevalence of menstrual-cycle irregularities found in surveys depends on the definition of menstrual function used, but has been reported to be as high as 44 percent in athletic women. Research suggests that failure to increase dietary energy intake in compensation for the expenditure of energy during exercise can disrupt the hypothalamic-pituitary-ovarian (HPO) axis. Exercise training appears to have no suppressive effect on the HPO axis beyond the impact of its strain on energy availability.

There are several important reasons to discuss the treatment of menstrual-cycle irregularities. One reason is infertility; fortunately, the long-term effects of menstrual cycle dysfunction

appear to be reversible. Another medical consequence is skeletal demineralization, which occurs in hypoestrogenic women. Skeletal demineralization was first observed in amenorrheic athletes in 1984.

Initially, the lumbar spine appeared to be the primary site where skeletal demineralization occurs, but new techniques for measuring bone mineral density show that demineralization occurs throughout the skeleton. Some women with menstrual disturbances involved in high-impact activities, such as gymnastics and figure skating, display less demineralization than women runners.

Despite resumption of normal menses, the loss of bone mass during prolonged hypoestrogenemia is not completely reversible. Therefore, young women with low levels of circulating estrogen, due to menstrual irregularities, are at risk for low peak bone mass which may increase the potential for osteoporotic fractures later in life. An increased incidence of stress fractures also has been observed in the long bones and feet of women with menstrual irregularities.

The treatment goal for women with menstrual irregularities is the re-establishment of an appropriate hormonal environment for the maintenance of bone health. This can be achieved by the re-establishment of a regular menstrual cycle or by hormone replacement therapy, although

neither change has been shown to result in complete recovery of the lost bone mass. Additional research is necessary to develop a specific prognosis for exercise-induced menstrual dysfunction.

All student-athletes with menstrual irregularities should be seen by a physician. General guidelines include:

1. Full medical evaluation, including an endocrine work-up and bone mineral density test;
2. Nutritional counseling with specific emphasis on:
 - a. Total caloric intake versus energy expenditure.
 - b. Calcium intake of 1,200 to 1,500 milligrams a day; and
3. Routine monitoring of the diet, menstrual function, weight-training schedule and exercise habits.

If this treatment scheme does not result in regular menstrual cycles, estrogen-progesterone supplementation should be considered. This should be coupled with appropriate counseling on hormone replacement and review of family history. Hormone-replacement therapy is thought to be important for amenorrheic women and oligomenorrheic women whose hormonal profile reveals an estrogen deficiency.

The relationship between amenorrhea, osteoporosis and disordered

eating is termed the “female athlete triad.” In 1997, the American College of Sports Medicine issued a position stand calling for all individuals working with physically active girls and women to be educated about the female athlete triad and develop plans for prevention, recognition, treatment and risk reduction. Recommendations are that any student-athlete who presents with any one component of the triad be screened for the other two components and referred for medical evaluation.

Other recommendations include:

- All sports medicine professionals, including coaches and athletic trainers, should learn to recognize the symptoms and risks associated with the female athlete triad.
- Coaches and others should avoid pressuring female athletes to diet and lose weight and should be educated about the warning signs of eating disorders.
- Sports medicine professionals, athletics administrators and officials of sport governing bodies share a responsibility to prevent, recognize and treat this disorder.
- Sports medicine professionals, athletics administrators and officials of sport governing bodies should work toward offering opportunities for educating and monitoring coaches to ensure safe training practices.
- Young, physically active females should be educated about proper nutrition, safe training practices, and the risks and warning signs of the female athlete triad.

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Blood-Borne Pathogens and Intercollegiate Athletics

April 1988 • Revised August 2004

Blood-borne pathogens are disease-causing microorganisms that can be potentially transmitted through blood contact. The blood-borne pathogens of concern include (but are not limited to) the hepatitis B virus (HBV) and the human immunodeficiency virus (HIV). Infections with these (HBV, HIV) viruses have increased throughout the last decade among all portions of the general population. These diseases have potential for catastrophic health consequences. Knowledge and awareness of appropriate preventive strategies are essential for all members of society, including student-athletes.

The particular blood-borne pathogens HBV and HIV are transmitted through sexual contact (heterosexual and homosexual), direct contact with infected blood or blood components, and perinatally from mother to baby. In addition, behaviors such as body piercing and tattoos may place student-athletes at some increased risk for contracting HBV, HIV or Hepatitis C.

The emphasis for the student-athlete and the athletics health-care team should be placed predominately on education and concern about these

traditional routes of transmission from behaviors off the athletics field. Experts have concurred that the risk of transmission on the athletics field is minimal.

Hepatitis B Virus (HBV)

HBV is a blood-borne pathogen that can cause infection of the liver. Many of those infected will have no symptoms or a mild flu-like illness. One-third will have severe hepatitis, which will cause the death of one percent of that group. Approximately 300,000 cases of acute HBV infection occur in the United States every year, mostly in adults.

Five to 10 percent of acutely infected adults become chronically infected with the virus (HBV carriers). Currently in the United States there are approximately one million chronic carriers. Chronic complications of HBV infection include cirrhosis of the liver and liver cancer.

Individuals at the greatest risk for becoming infected include those practicing risky behaviors of having unprotected sexual intercourse or sharing intravenous (IV) needles in any form. There is also evidence that

household contacts with chronic HBV carriers can lead to infection without having had sexual intercourse or sharing of IV needles. These rare instances probably occur when the virus is transmitted through unrecognized-wound or mucous-membrane exposure.

The incidence of HBV in student-athletes is presumably low, but those participating in risky behavior off the athletics field have an increased likelihood of infection (just as in the case of HIV). An effective vaccine to prevent HBV is available and recommended for all college students by the American College Health Association. Numerous other groups have recognized the potential benefits of universal vaccination of the entire adolescent and young-adult population.

HIV (AIDS Virus)

The Acquired Immunodeficiency Syndrome (AIDS) is caused by the human immunodeficiency virus (HIV), which infects cells of the immune system and other tissues, such as the brain. Some of those infected with HIV will remain asymptomatic for many years. Others will more rapidly develop

manifestations of HIV disease (i.e., AIDS). Some experts believe virtually all persons infected with HIV eventually will develop AIDS and that AIDS is uniformly fatal. In the United States, adolescents are at special risk for HIV infection. This age group is one of the fastest growing groups of new HIV infections. Approximately 14 percent of all new HIV infections occur in persons aged between 12 to 24 years. The risk of infection is increased by having unprotected sexual intercourse, and the sharing of IV needles in any form. Like HBV, there is evidence that suggests that HIV has been transmitted in household-contact settings without sexual contact or IV needle sharing among those household contacts^{5,6}. Similar to HBV, these rare instances probably occurred through unrecognized-wound or mucous-membrane exposure.

Comparison of HBV/HIV

Hepatitis B is a much more “sturdy/durable” virus than HIV and is much more concentrated in blood. HBV has a much more likely transmission with exposure to infected blood; particularly parenteral (needle-stick) exposure, but also exposure to open wounds and mucous membranes. There has been one well-documented case of transmission of HBV in the athletics setting, among sumo wrestlers in Japan. There are no validated cases of HIV transmission in the athletics setting. The risk of transmission for either HBV or HIV on the field is considered minimal; however, most experts agree that the specific epidemiologic and biologic characteristics of the HBV virus make it a realistic concern for transmission in sports with sustained, close physical contact, such as wrestling. HBV is considered to have a potentially higher risk of transmission than HIV.

Testing of Student-Athletes

Routine mandatory testing of student-athletes for either HBV or HIV for participation purposes is not recommended. Individuals who desire voluntary testing based on personal reasons and risk factors, however, should be assisted in obtaining such services by appropriate campus or public-health officials.

Student-athletes who engage in high-risk behavior are encouraged to seek counseling and testing. Knowledge of one's HBV and HIV infection is helpful for a variety of reasons, including the availability of potentially effective therapy for asymptomatic patients, and modification of behavior, which can prevent transmission of the virus to others. Appropriate counseling regarding exercise and sports participation also can be accomplished.

Participation by the Student-Athlete with Hepatitis B (HBV) Infection

Individual's Health—In general, acute HBV should be viewed just as other viral infections. Decisions regarding ability to play are made according to clinical signs and symptoms, such as fatigue or fever. There is no evidence that intense, highly competitive training is a problem for the asymptomatic HBV carrier (acute or chronic) without evidence of organ impairment. Therefore, the simple presence of HBV infection does not mandate removal from play.

Disease Transmission—The student-athlete with either acute or chronic HBV infection presents very limited risk of disease transmission in most sports. However, the HBV

carrier presents a more distinct transmission risk than the HIV carrier (see previous discussion of comparison of HBV to HIV) in sports with higher potential for blood exposure and sustained, close body contact. Within the NCAA, wrestling is the sport that best fits this description.

The specific epidemiologic and biologic characteristics of hepatitis B virus form the basis for the following recommendation: If a student-athlete develops acute HBV illness, it is prudent to consider removal of the individual from combative, sustained close-contact sports (e.g., wrestling) until loss of infectivity is known. (The best marker for infectivity is the HBV antigen, which may persist up to 20 weeks in the acute stage). Student-athletes in such sports who develop chronic HBV infections (especially those who are e-antigen positive) should probably be removed from competition indefinitely, due to the small but realistic risk of transmitting HBV to other student-athletes.

Participation of the Student-Athlete with HIV

Individual's Health—In general, the decision to allow an HIV-positive student-athlete to participate in intercollegiate athletics should be made on the basis of the individual's health status. If the student-athlete is asymptomatic and without evidence of deficiencies in immunologic function, then the presence of HIV infection in and of itself does not mandate removal from play.

The team physician must be knowledgeable in the issues surrounding the management of HIV-infected student-athletes. HIV must be recognized as a potentially chronic disease, frequently affording the affected individual many years of

Blood-Borne Pathogens and Intercollegiate Athletics

The identity of individuals infected with a blood-borne pathogen must remain confidential. Only those persons in whom the infected student-athlete chooses to confide have a right to know about this aspect of the student-athlete's medical history. This confidentiality must be respected in every case and at all times by all college officials, including coaches, unless the student-athlete chooses to make the fact public.

excellent health and productive life during its natural history. During this period of preserved health, the team physician may be involved in a series of complex issues surrounding the advisability of continued exercise and athletics competition.

The decision to advise continued athletics competition should involve the student-athlete, the student-athlete's personal physician and the team physician. Variables to be considered in reaching the decision include the student-athlete's current state of health and the status of his/her HIV infection, the nature and intensity of his/her training, and potential contribution of stress from athletics competition to deterioration of his/her health status.

There is no evidence that exercise and training of moderate intensity is harmful to the health of HIV-infected individuals. What little data that exists on the effects of intense training on the HIV-infected individual demonstrates no evidence of health risk. However, there is no data looking at the effects of long-term intense training and competition at an elite, highly competitive level on the health of the HIV-infected student-athlete.

Disease Transmission—Concerns of transmission in athletics revolve around exposure to contaminated blood through open wounds or mucous membranes. Precise risk of such transmission is impossible to calculate, but epidemiologic and biologic evidence suggests that it is extremely low (see section on comparison of HBV/HIV). There have been no validated reports of transmission of HIV in the athletics setting^{3,13}. Therefore, there is no recommended restriction of student-athletes merely because they are

infected with HIV, although one court has upheld the exclusion of an HIV-positive athlete from the contact sport of karate¹⁹.

Administrative Issues

The identity of individuals infected with a blood-borne pathogen must remain confidential. Only those persons in whom the infected student-athlete chooses to confide have a right to know about this aspect of the student-athlete's medical history. This confidentiality must be respected in every case and at all times by all college officials, including coaches, unless the student-athlete chooses to make the fact public.

Athletics Health-Care Responsibilities

The following recommendations are designed to further minimize risk of blood-borne pathogens and other potentially infectious organisms transmission in the context of athletics events and to provide treatment guidelines for caregivers. In the past, these guidelines were referred to as "Universal (blood and body fluid) Precautions." Over time, the recognition of "Body Substance Isolation," or that infectious diseases may also be transmitted from moist body substances, has led to a blending of terms now referred to as "Standard Precautions." Standard precautions apply to blood, body fluids, secretions and excretions, except sweat, regardless of whether or not they contain visible blood. These guidelines, originally developed for health-care, have additions or modifications relevant to athletics. They are divided into two sections — the care of the student-athlete, and cleaning and disinfection of environmental surfaces.

Blood-Borne Pathogens and Intercollegiate Athletics

Care of the Athlete:

1. All personnel involved in sports who care for injured or bleeding student-athletes should be properly trained in first aid and standard precautions.
2. Assemble and maintain equipment and/or supplies for treating injured/bleeding athletes. Items may include: Personal Protective Equipment (PPE) [minimal protection includes gloves, goggles, mask, fluid-resistant gown if chance of splash or splatter]; antiseptics; antimicrobial wipes; bandages or dressings; medical equipment needed for treatment; appropriately labeled “sharps” container for disposal of needles, syringes and scalpels; and waste receptacles appropriate for soiled equipment, uniforms, towels and other waste.
3. Pre-event preparation includes proper care for wounds, abrasions or cuts that may serve as a source of bleeding or as a port of entry for blood-borne pathogens or other potentially infectious organisms. These wounds should be covered

with an occlusive dressing that will withstand the demands of competition. Likewise, care providers with healing wounds or dermatitis should have these areas adequately covered to prevent transmission to or from a participant. Student-athletes may be advised to wear more protective equipment on high-risk areas, such as elbows and hands.

4. The necessary equipment and/or supplies important for compliance with standard precautions should be available to caregivers. These supplies include appropriate gloves, disinfectant bleach, antiseptics, designated receptacles for soiled equipment and uniforms, bandages and/or dressings, and a container for appropriate disposal of needles, syringes or scalpels.

5. When a student-athlete is bleeding, the bleeding must be stopped and the open wound covered with a dressing sturdy enough to withstand the demands of activity before the student-athlete may continue participation in practice or competition. Current

NCAA policy mandates the immediate, aggressive treatment of open wounds or skin lesions that are deemed potential risks for transmission of disease. Participants with active bleeding should be removed from the event as soon as is practical. Return to play is determined by appropriate medical staff personnel and/or sport officials. Any participant whose uniform is saturated with blood must change their uniform before return to participation.

6. During an event, early recognition of uncontrolled bleeding is the responsibility of officials, student-athletes, coaches and medical personnel. In particular, student-athletes should be aware of their responsibility to report a bleeding wound to the proper medical personnel.

7. Personnel managing an acute blood exposure must follow the guidelines for standard precaution. Gloves and other PPE, if necessary, should be worn for direct contact with blood or other body fluids. Gloves should be changed after treating each individual participant. After removing gloves, hands should be washed.

8. If blood or body fluids are transferred from an injured or bleeding student-athlete to the intact skin of another athlete, the event must be stopped, the skin cleaned with antimicrobial wipes to remove gross contaminate, and the athlete instructed to wash with soap and water as soon as possible. NOTE: Chemical germicides intended for use on environmental surfaces should never be used on student-athletes.

9. Any needles, syringes or scalpels should be carefully disposed of in an appropriately labeled “sharps” container. Medical equipment,



Blood-Borne Pathogens and Intercollegiate Athletics

bandages, dressings and other waste should be disposed of according to facility protocol. During events, uniforms or other contaminated linens should be disposed of in a designated container to prevent contamination of other items or personnel. At the end of competition, the linen should be laundered and dried according to facility protocol; hot water at temperatures of 71 degrees Celsius (160 degrees Fahrenheit) for 25-minute cycles may be used.

Care of Environmental Surfaces:

1. All individuals responsible for cleaning and disinfection of blood spills or other potentially infectious materials (OPIM) should be properly trained on procedures and the use of standard precautions.
2. Assemble and maintain supplies for cleaning and disinfection of hard surfaces contaminated by blood or OPIM. Items include: Personal Protective Equipment (PPE) [gloves, goggles, mask, fluid-resistant gown if chance of splash or splatter]; supply of absorbent paper towels or disposable cloths; red plastic bag with the biohazard symbol on it or other waste receptacle according to facility protocol; and properly diluted tuberculocidal disinfectant or freshly prepared bleach solution diluted (1:100 bleach/water ratio).

3. Put on disposable gloves.
4. Remove visible organic material by covering with paper towels or disposable cloths. Place soiled towels or cloths in red bag or other waste receptacle according to facility protocol. (Use additional towels or cloths to remove as much organic material as possible from the surface and place in the waste receptacle.)
5. Spray the surface with a properly diluted chemical germicide used according to manufacturer's label recommendations for disinfection, and wipe clean. Place soiled towels in waste receptacle.
6. Spray the surface with either a properly diluted tuberculocidal chemical germicide or a freshly prepared bleach solution diluted 1:100, and follow manufacturer's label directions for disinfection; wipe clean. Place towels in waste receptacle.
7. Remove gloves and wash hands.
8. Dispose of waste according to facility protocol.

Final Notes:

1. All personnel responsible for caring for bleeding individuals should be encouraged to obtain a Hepatitis B (HBV) vaccination.
2. Latex allergies should be considered. Non-latex gloves may be

used for treating student-athletes and the cleaning and disinfection of environmental surfaces.

3. Occupational Safety and Health Administration (OSHA) standards for Bloodborne Pathogens (Standard #29 CFR 1910.1030) and Hazard Communication (Standard #29 CFR 1910.1200) should be reviewed for further information.

Member institutions should ensure that policies exist for orientation and education of all health-care workers on the prevention and transmission of blood-borne pathogens. Additionally, in 1992, the Occupational Safety and Health Administration (OSHA) developed a standard directed to eliminating or minimizing occupational exposure to blood-borne pathogens. Many of the recommendations included in this guideline are part of the standard. Each member institution should determine the applicability of the OSHA standard to its personnel and facilities.

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The Use of Local Anesthetics in College Athletics

June 1992 • Revised June 2004

The use of local injectable anesthetics to treat sports-related injuries in college athletics is primarily left to the discretion of the physician treating the individual, since there is little scientific research on the subject. This guideline provides basic recommendations for the use of these substances, which commonly include lidocaine (Xylocaine), one or two percent; bupivacaine (Marcaine), 0.25 to 0.50 percent; and mepivacaine (Carbocaine), three percent. The following recommendations do not include the use of corticosteroids.

It is recommended that:

1. These agents should be administered only by a qualified clinician who is licensed to perform this procedure and who is familiar with these agents' actions, reactions, interactions and complications. The treating clinician should be well aware of the quantity of these agents that can be safely injected.
2. These agents should only be administered in facilities equipped to handle any allergic reaction, including a cardiopulmonary emergency, which may follow their use.

3. These agents should only be administered when medically justified, when the risk of administration is fully explained to the patient, when the use is not harmful to continued athletics activity and when there is no enhancement of a risk of injury.

The following procedures are not recommended:

1. The use of local anesthetic injections if they jeopardize the ability of the student-athlete to protect himself or herself from injury.
2. The administration of these drugs by anyone other than a qualified clinician licensed to perform this procedure.
3. The use of these drugs in combination with epinephrine or other vasoconstrictor agents in fingers, toes, earlobes and other areas where a decrease in circulation, even if only temporary, could result in significant harm.



The Use of Injectable Corticosteroids in Sports Injuries

June 1992 • Revised June 2004

Corticosteroids, alone or in combination with local anesthetics, have been used for many years to treat certain sports-related injuries. This guideline is an attempt to identify specific circumstances in which corticosteroids may be appropriate and also to remind both physicians and student-athletes of the inherent dangers associated with their use.

The most common reason for the

use of corticosteroids in athletics is the treatment of chronic overuse syndromes such as bursitis, tenosynovitis and muscle origin pain (for example, lateral epicondylitis). They have also been used to try to prevent redevelopment of a ganglion, and to reduce keloid scar formation. Rarely is it appropriate to treat acute syndromes such as acromio-clavicular (AC) joint separations or hip pointers with a

corticosteroid.

There is still much to be learned about the effects of intra-articular, intraligamentous or intratendinous injection of corticosteroids. Researchers have noted reduced synthesis of articular cartilage after corticosteroid administration in both animals and human models. However, a causal relationship between the intra-articular corticosteroid and degeneration of



The Use of Injectable Corticosteroids in Sports Injuries

articular cartilage has not been established. Research also has shown that a single intraligamentous or multiple intra-articular injections have the potential to cause significant and long-lasting deterioration in the mechanical properties of ligaments and collagenous tissues in animal models. Finally, studies have shown significant degenerative changes in active animal tendons treated with a corticosteroid as early as 48 hours after injection.

This research provides the basis for the following recommendations regarding the administration of corticosteroids in college athletics.

It is recommended that:

1. Injectable corticosteroids should be administered only after more conservative treatments, including nonsteroidal anti-inflammatory agents, rest, ice, ultrasound and various treatment modalities, have been exhausted.
2. Only those physicians who are knowledgeable about the chemical makeup, dosage, onset of action, duration and potential toxicity of these agents should administer corticosteroids.
3. These agents should be administered only in facilities that are equipped to deal with allergic reactions, including cardiopulmonary emergencies.
4. Repeated corticosteroid injections at a specific site should be done only after the consequences and benefits of the injections have been thoroughly evaluated.
5. Corticosteroid injections only should be done if a therapeutic effect is medically warranted and the student-athlete is not subject to either short- or long-term significant risk.
6. These agents should only be

administered when medically justified, when the risk of administration is fully explained to the patient, when the use is not harmful to continued athletics activity and when there is no enhancement of a risk of injury.

The following procedures are not recommended:

1. Intra-articular injections, particularly in major weight-bearing joints. Intra-articular injections have a potential softening effect on articular cartilage.
2. Intratendinous injections, since such injections have been associated with an increased risk of rupture.
3. Administration of injected corticosteroids immediately before a competition.
4. Administration of corticosteroids in acute trauma.
5. Administration of corticosteroids in infection.

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Depression: Interventions for Intercollegiate Athletics

June 2006

The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Sam Maniar, Licensed Psychologist, The Ohio State University; Margot Putukian, Team Physician, Princeton University; and the National Institute of Mental Health, Bethesda, Maryland; for their original content.

Depression is more than the blues, let-downs from a game loss, or the normal daily ups and downs. It's feeling "down" and "low" and "hopeless" for weeks at a time. Depression is a serious medical condition.

Little research has been conducted on depression among student-athletes; however, preliminary data indicate that student-athletes experience depressive symptoms and illness at similar or increased rates than non-athlete students. Approximately 9.5 percent of the population — or one out of 10 people — suffer from a depressive illness during any given one-year period. Women are twice as likely to experience depression as men; however, men are less likely to admit to depression. Moreover, even

though the majority of peoples' depressive disorders can be improved, most people with depression do not seek help.

Depression is important to assess among student-athletes because it impacts overall personal well-being, athletic performance, academic performance and injury healing. No two people become depressed in exactly the same way, but with the proper treatment 80 percent of those who seek help get better, and many people begin to feel better in just a few weeks.

Depression and Intercollegiate Athletics

Student-athletes may experience depression because of genetic predisposition, developmental challenges of college transitions, academic stress, financial pressures, interpersonal difficulties and grief over loss/failure.

Participation in athletics does not provide student-athletes any immunity to these stresses, and it has the potential to pose additional demands. Student-athletes must balance all of the demands of being a college student along with athletics demands. This includes the

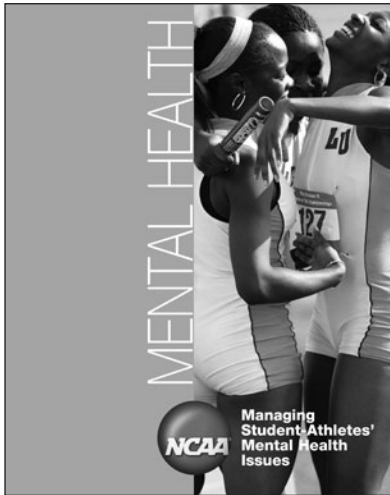
physical demands of their sport, and the time commitment of participation, strength and conditioning, and skill instruction.

Most athletes participate almost year-round, often missing holidays, school and summer breaks, classes and even graduation. In addition, if they struggle in their performance, have difficulty interacting with the coach or teammates, or they lose their passion for their sport, it can be very difficult to handle. Many athletes also define themselves by their role as an athlete, and an injury can be devastating.

Some attributes of athletics and competition can make it extremely difficult for student-athletes to obtain help. They are taught to "play through the pain," struggle through adversity, handle problems on their own and "never let your enemies see you cry." Seeking help is seen as a sign of weakness, when it should be recognized as a sign of strength.

Team dynamics also may be a factor. Problems often are kept "in the family," and it is common for teams to try to solve problems by themselves, often ignoring signs or symptoms of more serious issues.

Depression: Intervention for Intercollegiate Athletics



Available online at NCAA.org/health-safety.

Depression affects approximately 19 million Americans, and for many, the symptoms first appear before or during college.

Early identification and intervention (referral/treatment) for depression or other mental illness is extremely important, yet may be inhibited within the athletics culture for the following reasons:

- Physical illness or injury is more readily measured and treated within sports medicine, and often there is less comfort in addressing mental illness.
- Mental wellness is not always perceived as necessary for athletic performance.
- The high profile of student-athletes may magnify the attention paid on campus and in the surrounding community when an athlete seeks help.
- History and tradition drive athletics and can stand as barriers to change.
- The athletics department may have difficulty associating mental illness with athletic participation.

Enhancing knowledge and awareness of depressive disorders

Sports medicine staff, coaches and student-athletes should be knowledgeable about the types of depression and related symptoms. Men may be more willing to report fatigue, irritability, loss of interest in work or hobbies and sleep disturbances, rather than feelings of sadness, worthlessness and excessive guilt, which are commonly associated with depression in women. Men often mask depression with the use of alcohol or drugs, or by the socially acceptable habit of working excessively long hours.

Types of Depressive Illness

Depressive illnesses come in different forms. The following are general descriptions of the three most prevalent, though for an individual the number, severity and duration of symptoms will vary.

Major Depression, or “clinical depression,” is manifested by a combination of symptoms that interfere with a person’s once pleasurable activities (school, sport, sleep, eating, work). Student-athletes experiencing five or more symptoms as noted in Table 1 for two weeks or longer, or noticeable changes in usual functioning, are factors that should prompt referral to the team physician or mental health professional. Fifteen percent of people with major depression die by suicide. The rate of suicide in men is four times that of women, though more women attempt it during their lives.

Dysthymia is a less severe form of depression that tends to involve long-term, chronic depressive symptoms. Although these symptoms are not disabling, they do affect the individual’s overall functioning.

Bipolar Disorder, or “manic-depressive illness,” involves cycling mood swings from major depressive episodes to mania. Depressive episodes may last as little as two weeks, while manic episodes may last as little as four days. Manic signs and symptoms are presented in Table 2.

In addition to the three types of depressive disorders, student-athletes may suffer from an *Adjustment Disorder*. Adjustment disorders occur when an individual experiences depressive (or anxious) symptoms in response to a specific event or stressor (e.g., poor

performance, poor relationship with a coach). An adjustment disorder can also progress into major depressive disorder.

Establishing a relationship with mental health services

Athletics departments should identify and foster relationships with mental health resources on campus or within the local community that will enable the development of a diverse and effective referral plan addressing the mental well-being of their student-athletes and staff. Because student-athletes are less likely to use counseling than nonathlete students, increasing interaction among mental health staff members, coaches and student-athletes will improve compliance with referrals. Athletics departments can seek psychological services and mental health professionals from the following resources.

- Athletics department sports medicine services.
- Athletics department academic services.
- University student health and counseling services.
- University medical school.
- University graduate programs (health sciences, education, medical, allied health).
- Local community.

Screening for depression and related risk for suicide

One way to ensure an athletics department is in tune with student-athletes' mental well-being is to systematically include mental health check-ups, especially around **high-risk times such as the loss of a coach, significant injury, being cut**

from the team and catastrophic events. Members of the sports medicine team and/or licensed mental health professionals should also screen athletes for depression at pre-established points in time (e.g., pre-participation, exit interviews). Research indicates that sports medicine professionals are better equipped to assess depression with the use of appropriate mental health instruments; simply asking about depression is not recommended.

A thorough assessment on the part of a mental health professional is also imperative to differentiate major depression from dysthymia and bipolar disorder, and other conditions, such as medication use, viral illness, anxiety disorders, overtraining and illicit substance use. Depressive disorders may co-exist with substance-abuse disorders, panic disorder, obsessive-compulsive disorder, anorexia nervosa, bulimia nervosa and borderline personality disorder.

For depression screening, it is recommended that sports medicine teams use the Center for Epidemiological Studies Depression (CES-D) Scale published by the National Institute for Mental Health (NIMH). The CES-D is free to use and available at www.nimh.nih.gov. Other resources include such programs as QPR (Question, Persuade, Refer) Gatekeeper training; the Jed Foundation U Lifeline; and the Screening for Mental Health Depression and Anxiety Screenings. Information about these programs, and ways to incorporate them into student-athlete check-ups, can be found at NCAA.org/health-safety.

Seeking help

Most individuals who suffer from depression will fully recover to lead productive lives. A combination of

counseling and medication appears to be the most effective treatment for moderately and severely depressed individuals. Although some improvement in mood may occur in the first few weeks, it typically takes three to four weeks of treatment to obtain the full therapeutic effect. *Medication should only be taken and/or stopped under the direct care of a physician, and the team physicians should consult with psychiatrists regarding complex mental health issues.*

A referral should be made to a licensed mental health professional when coaches or sports medicine staff members witness any of the following with their student-athletes:

- Suicidal thoughts.
- Multiple depressive symptoms.
- A few depressive symptoms that persist for several weeks.
- Depressive symptoms that lead to more severe symptoms or destructive behaviors.
- Alcohol and drug abuse as an attempt at self treatment.
- Overtraining or burnout, since depression has many of the same symptoms.

Coaches and sports medicine staff members should follow the following guidelines in order to help enhancing student-athlete compliance with mental health referrals:

- Express confidence in the mental health professional (e.g., "I know that other student-athletes have felt better after talking to Dr. Kelly.").
- Be concrete about what counseling is and how it could help (e.g., "Amy can help you focus more on your strengths.").

Depression: Intervention for Intercollegiate Athletics

- Focus on similarities between the student-athlete and the mental health professional (e.g., “Bob has a sense of humor that you would appreciate.” “Dr. Jones is a former college student-athlete and understands the pressures student-athletes face.”).
- Offer to accompany the student-athletes to their initial appointment.
- Offer to make the appointment (or have the student-athlete make the appointment) while in your office.
- Emphasize the confidentiality of medical care and the referral process.

The following self-help strategies may improve mild depression symptoms:

- Reduce or eliminate the use of alcohol and drugs.
- Break large tasks into smaller ones; set realistic goals.
- Engage in regular, mild exercise.
- Eat regular and nutritious meals.
- Participate in activities that typically make you feel better.
- Let family, friends and coaches help you.
- Increase positive or optimistic thinking.
- Engage in regular and adequate sleep habits.

Table 1

DEPRESSIVE SIGNS AND SYMPTOMS

Individuals might present:

- Decreased performance in school or sport.
- Noticeable restlessness.
- Significant weight loss or weight gain.
- Decrease or increase in appetite nearly every day (fluctuating?).

Individuals might express:

- Indecisiveness.
- Feeling sad or unusually crying.
- Difficulty concentrating.
- Lack of or loss of interest or pleasure in activities that were once enjoyable (hanging out with friends, practice, school, sex).
- Depressed, sad or “empty” mood for most of the day and nearly every day.
- Recurrent thoughts of death or thoughts about suicide.
- Frequent feelings of worthlessness, low self-esteem, hopelessness, helplessness or inappropriate guilt.

Table 2

MANIC SIGNS AND SYMPTOMS

Individuals might present:

- Abnormal or excessive elation.
- Unusual irritability.
- Markedly increased energy.
- Poor judgment.
- Inappropriate social behavior.
- Increased talking.

Individuals might express:

- Racing thoughts.
- Increased sexual desire.
- Decreased need for sleep.
- Grandiose notions.

Using a simple tool such as this can help students and staff look for signs of depression.

Put a check mark by each sign that describes you:

- I am really sad most of the time.
- I don't enjoy doing the things I've always enjoyed doing.
- I don't sleep well at night and am very restless.
- I am always tired. I find it hard to get out of bed.
- I don't feel like eating much.
- I feel like eating all the time.
- I have lots of aches and pains that don't go away.
- I have little to no sexual energy.
- I find it hard to focus and am very forgetful.
- I am mad at everybody and everything.
- I feel upset and fearful, but can't figure out why.
- I don't feel like talking to people.
- I feel like there isn't much point to living, nothing good is going to happen to me.
- I don't like myself very much. I feel bad most of the time.
- I think about death a lot. I even think about how I might kill myself.

If you checked several boxes, call your doctor. Take the list to show the doctor. You may need to get a check-up and find out if you have depression.

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Participation by the Student-Athlete with Impairment

January 1976 • Revised August 2004

In accordance with the recommendations of major medical organizations and pursuant to the requirements of federal law (in particular, the Rehabilitation Act of 1976 and The Americans With Disabilities Act), the NCAA encourages participation by student-athletes with physical or mental impairments in intercollegiate athletics and physical activities to the full extent of their interests and abilities. It is imperative that the university's sports medicine personnel assess a student-athlete's medical needs and specific limitations on an individualized basis so that needless restrictions will be avoided and medical precautions will be taken to minimize any enhanced risk of harm to the student-athlete or others from participation in the subject sport.

A student-athlete with impairment should be given an opportunity to participate in an intercollegiate sport if he or she has the requisite abilities and skills in spite of his or her impairment, with or without a reasonable accommodation. Medical exclusion of a student-athlete from an athletics program should occur only when a mental or physical impairment 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. Recent judicial decisions have upheld a university's legal right to exclude a student-athlete from competition if the team physician has a reasonable medical basis for determining that athletic competition creates a significant risk of harm to the student-athlete or others. When student-athletes with impairments not otherwise qualified to participate in existing athletics programs are identified, every means should be explored by member institutions to provide suitable sport and recreational programs in the most appropriate, integrated settings possible to meet their interests and abilities.

Participation Considerations

Before allowing any student-athlete with an impairment to participate in an athletics program, it is recommended that an institution require joint approval from the physician most familiar with the student-athlete's condition, the team physician, and an appropriate official of the institution as well as

his or her parent(s) or guardian. The following factors should be considered on an individualized basis in determining whether he or she should participate in a particular sport:

1. Available published information regarding the medical risks of participation in the sport with the athlete's mental or physical impairment;
2. The current health status of the student-athlete;
3. The physical demands of the sport and position(s) that the student-athlete will play;
4. Availability of acceptable protective equipment or measures to reduce effectively the risk of harm to the student-athlete or others; and
5. The ability of the student-athlete [and, in the case of a minor, the parent(s) or guardian] to fully understand the material risks of athletic participation.

Organ Absence or Non-function

When the absence or non-function of a paired organ constitutes the impairment, the following specific

Participation by the Student-Athlete with Impairment

issues need to be addressed with the student-athlete and his/her parents or guardian (in the case of a minor). The following factors should be considered:

1. The quality and function of the remaining organ;
2. The probability of injury to the remaining organ; and
3. The availability of current protective equipment and the likely effectiveness of such equipment to prevent injury to the remaining organ.

Medical Release

When a student-athlete with impairment is allowed to compete in the intercollegiate athletics program, it is recommended that a properly executed document of understanding and a waiver release the institution for any legal liability for injury or death arising out of the student-athlete's participation with his or her mental or physical impairment/medical condition. The following parties should sign this document: the student-athlete, his or her parents/guardians, the team physician and any consulting physician, a representative of the institution's athletics department, and the institution's legal counsel. This document evidences the student-athlete's understanding of his or her medical condition and the potential risks of athletic participation, but it may not immunize the institution from legal liability for injury to the student-athlete.

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NCAA® GUIDELINE 2q

Pregnancy in the Student-Athlete

January 1986 • Revised June 2009

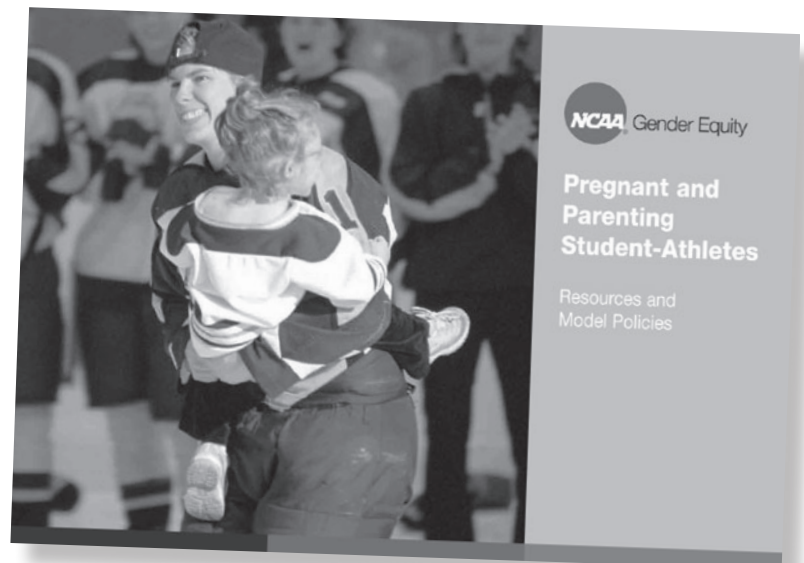
The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Dr. James Clapp, FACSM, in the revision of this guideline.

Pregnancy Policies

Pregnancy places unique challenges on the student-athlete. Each member institution should have a policy clearly outlined to address the rights and responsibilities of the pregnant student-athlete. The policy should address:

- Where the student-athlete can receive confidential counseling;
- Where the student-athlete can access timely medical and obstetrical care;
- How the pregnancy may affect the student-athlete's team standing and institutional grants-in-aid;
- That pregnancy should be treated as any other temporary health condition regarding receipt of institutional grants-in-aid; and
- That NCAA rules permit a one-year extension of the five-year period of eligibility for a female student-athlete for reasons of pregnancy.

Student-athletes should not be forced to terminate a pregnancy because of financial or psychological pressure or fear of losing their institutional grants-in-aid. See Bylaw 15.3.4.3, which specifies that institutional financial



aid based in any degree on athletics ability may not be reduced or canceled during the period of its award because of an injury, illness or physical or mental medical condition.

The team's certified athletic trainer or team physician is often approached in confidence by the student-athlete. 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 such time

when there is medical reason to withhold the student-athlete from competition.

Exercise in Pregnancy

Assessing the risk of intense, strenuous physical activity in pregnancy is difficult. There is some evidence that women who exercise during pregnancy have improved cardiovascular function, limited weight gain and fat retention, improved attitude and mental state, easier and less complicated labor, and enhanced postpartum recovery. There is no evidence that increased activity increases the risk of

Participation by the Pregnant Student-Athlete

spontaneous abortion in uncomplicated pregnancies. There are, however, theoretical risks to the fetus associated with increased core body temperatures that may occur with exercise, especially in the heat.

The fetus may benefit from exercise during pregnancy in several ways, including an increased tolerance for the physiologic stresses of late pregnancy, labor and delivery.

The safety of participation in individual sports by a pregnant woman should be dictated by the movements and physical demands required to compete in that sport and the previous activity level of the individual. The American College of Sports Medicine discourages heavy weight lifting or similar activities that require straining or valsalva.

Exercise in the supine position after the first trimester may cause venous obstruction and conditioning or training exercises in this position should be avoided.

Sports with increased incidences of bodily contact (basketball, ice hockey, field hockey, lacrosse, soccer, rugby) or falling (gymnastics, equestrian, downhill skiing) are generally considered higher risk after the first trimester because of the potential risk of abdominal trauma. The student-athlete's ability to compete may also be compromised due to changes in physiologic capacity, and musculoskeletal issues unique to pregnancy. There is also concern that in the setting of intense competition a pregnant athlete will be less likely to respond to internal cues to moderate exercise and may feel pressure not to let down the team.

The American College of Obstetrics and Gynecology states that competitive athletes can remain active during pregnancy but

Table 1
Warning Signs to Terminate Exercise While Pregnant

Vaginal Bleeding
Shortness of Breath Before Exercise
Dizziness
Headache
Chest Pain
Calf Pain or Swelling
Pre-term Labor
Decreased Fetal Movement
Amniotic Fluid Leakage
Muscle Weakness

need to modify their activity as medically indicated and require close supervision.

If a student-athlete chooses to compete while pregnant, she should:

- Be made aware of the potential risks of her particular sport and exercise in general while pregnant;
- Be encouraged to discontinue exercise when feeling over-exerted or when any warning signs (Table 1) are present;
- Follow the recommendations of her obstetrical provider in coordination with the team physician; and
- Take care to remain well-hydrated and to avoid over-heating.

After delivery or pregnancy termination, medical clearance is recommended to ensure the student-athlete's safe return to athletics. (See Follow-up Examinations section of Guideline 1b.) The physiologic changes of pregnancy persist four to six weeks postpartum, however, there have been no known maternal complications from resumption of training. Care should be taken to individualize return to practice and competition.

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The Student-Athlete with Sickle Cell Trait

October 1975 • Revised June 2008

Sickle cell trait is not a disease. It is the inheritance of one gene for normal hemoglobin (A) and one gene for sickle hemoglobin (S), giving the genotype AS. Sickle cell trait (AS) is not sickle cell anemia (SS), in which two abnormal genes are inherited. Sickle cell anemia causes major anemia and many clinical problems, whereas sickle cell trait causes no anemia and few clinical problems. Sickle cell trait will not turn into the disease. However, it is possible to have symptoms of the disease under extreme conditions of physical stress or low oxygen levels. In some cases, athletes with the trait have expressed significant distress, collapsed and even died during rigorous exercise.

People at high risk for having sickle cell trait are those whose ancestors come from Africa, South or Central America, the Caribbean, Mediterranean countries, India, and Saudi Arabia. Sickle cell trait occurs in about 8 percent of the U.S. African-American population and rarely (between one in 2,000 to one in 10,000) in the Caucasian population. It is present in athletes at all levels, including high school, collegiate, Olympic and professional. Sickle cell trait is no barrier to outstanding athletic performance.

Sickle cell trait is generally benign

and consistent with a long, healthy life. As they get older, some persons with the trait become unable to concentrate urine normally, but this is not a key problem for college athletes. Most athletes complete their careers without any complications. However, there are three constant concerns that exist for athletes with sickle cell trait: gross hematuria, splenic infarction, and exertional rhabdomyolysis, which can be fatal.

Gross hematuria, visible blood in the urine, usually from the left kidney, is an occasional complication of sickle cell trait. Athletes should consult a physician for return-to-play clearance.

Splenic infarction can occur in people with sickle cell trait, typically at altitude. The risk may begin at 5,000 feet and increases with rising altitude. Vigorous exercise (e.g., skiing, basketball, football, hiking, anaerobic conditioning) may increase the risk. Splenic infarction causes left upper quadrant or lower chest pain, often with nausea and vomiting. It can mimic pleurisy, pneumothorax, side stitch, or renal colic. Splenic infarction at altitude has occurred in athletes with sickle trait. Athletes should consult a physician for return-to-play clearance.

Exertional rhabdomyolysis can be life-threatening. During intense exertion and hypoxemia, sickled red cells can accumulate in the blood. Dehydration worsens exertional sickling. Sickled red cells can “logjam” blood vessels in working muscles and provoke ischemic rhabdomyolysis. Exertional rhabdomyolysis is not exclusive to athletes with sickle cell trait. Planned emergency response and prompt access to medical care are critical components to ensure adequate response to a collapse or athlete in distress.

The U.S. Armed Forces linked sickle trait to sudden unexplained death during basic training. Recruits with sickle cell trait were about 30 times more likely to die than other recruits. The deaths were initially classified as either acute cardiac arrest of undefined mechanism or deaths related to heat stroke, heat stress, or rhabdomyolysis. Further analysis showed that the major risk was severe exertional rhabdomyolysis, a risk that was about 200 times greater for recruits with sickle cell trait. Deaths among college athletes with sickle cell trait, almost exclusively in football dating back to 1974, have been from exertional rhabdomyolysis, including early cardiac death from hyperkalemia and lactic acidosis and later

The Student-Athlete with Sickle Cell Trait

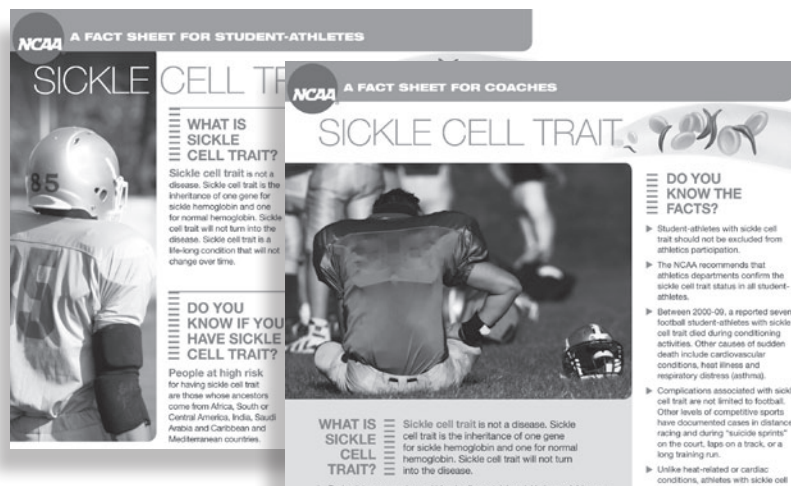
metabolic death from acute myoglobinuric renal failure.

In other cases, athletes have survived collapses while running a distance race, sprinting on a basketball court or football field, and running timed laps on a track. The harder and faster athletes go, the earlier and greater the sickling. Sickling can begin in only two to three minutes of sprinting, or in any other all-out exertion of sustained effort, thus quickly increasing the risk of collapse. Athletes with sickle cell trait cannot be “conditioned” out of the trait and coaches pushing these athletes beyond their normal physiological response to stop and recover place these athletes at an increased risk for collapse.

A sickling collapse is a medical emergency. Even the most fit athletes can experience a sickling collapse. Themes from the literature describe sickling athletes with ischemic pain and muscle weakness rather than muscular cramping or “locking up.” Unlike cardiac collapse (with ventricular fibrillation), the athlete who slumps to the ground from sickling can still talk. This athlete is typically experiencing major lactic acidosis, impending shock, and imminent hyperkalemia from sudden rhabdomyolysis that can lead to life-threatening complications or even sudden death. The emergent management of a sickling collapse is covered in the references.

Screening for sickle cell trait as part of the medical examination process is required in Division I institutions unless documented results of a prior test are provided to the institution or the prospective

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student-athlete or student-athlete declines the test and signs a written release. The references allude to growing support for the practical benefits of screening and campuses that screen are increasing in frequency. Screening can be accomplished with a simple blood test that is relatively inexpensive. Although sickle cell trait screening is normally performed on all U.S. babies at birth, many student-athletes may not know whether they have the trait. **Following the recommendations of the National Athletic Trainers Association (NATA) and the College of American Pathologists (CAP), if the trait is not known, the NCAA requires athletics departments to confirm sickle cell trait status in all student-athletes, or have student-athletes sign a written release declining the sickle cell solubility test, during the medical examination (Bylaw 17.1.5) period.**

If a test is positive, the student-athlete should be offered counseling on the implications of sickle cell trait, including health, athletics and family planning.

Beginning August 1, 2010, Division I requires student-athletes new to their campus to complete a sickle cell solubility test, show results of a prior test, or sign a written release declining the test. See Division I Bylaw 17.1.5.1.

Screening can be used as a gateway to targeted precautions.

Precautions can enable student-athletes with sickle cell trait to thrive in their sport. These precautions are outlined in the references and in a 2007 NATA Consensus Statement on Sickle Cell Trait and the Athlete. Knowledge of a student-athlete's sickle cell status should facilitate prompt and appropriate medical care during a medical emergency.

Student-athletes with sickle cell trait should be knowledgeable of these precautions and institutions

should provide an environment in which these precautions may be activated. In general, these precautions suggest student-athletes with sickle cell trait should:

- Set their own pace.
- Engage in a slow and gradual preseason conditioning regimen to be prepared for sports-specific performance testing and the rigors of competitive intercollegiate athletics.
- Build up slowly while training (e.g., paced progressions).
- Use adequate rest and recovery

between repetitions, especially during “gassers” and intense station or “mat” drills.

- Not be urged to perform all-out exertion of any kind beyond two to three minutes without a breather.
- Be excused from performance tests such as serial sprints or timed mile runs, especially if these are not normal sport activities.
- Stop activity immediately upon struggling or experiencing symptoms such as muscle pain, abnormal weakness, undue fatigue

or breathlessness.

- Stay well hydrated at all times, especially in hot and humid conditions.
- Maintain proper asthma management.
- Refrain from extreme exercise during acute illness, if feeling ill, or while experiencing a fever.
- Access supplemental oxygen at altitude as needed.
- Seek prompt medical care when experiencing unusual distress.

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Equipment

Also found on the NCAA website at: NCAA.org/health-safety

3

NCAA® GUIDELINE 3a

Protective Equipment

June 1983 • Revised June 2007

Rules governing mandatory equipment and equipment use vary by sport. Athletics personnel should be familiar with what equipment is mandatory by rule and what constitutes illegal equipment; how to wear mandatory equipment during the contest; and when to notify the coaching staff that the equipment has become illegal during competition. Athletics personnel involved in sports with established

equipment standards should adhere to those standards.

The NOCSAE mark on a helmet or HECC seal on an ice hockey face mask indicates that the equipment has been tested by the manufacturer in accordance with NOCSAE or HECC test standards. By keeping a proper fit, by not modifying its design, and by reporting to the coach or equipment manager any need for

its maintenance, the student-athlete also is complying with the purpose of the standard.

The following list of mandatory equipment and rules regarding protective equipment use is based on NCAA sports rules. The most updated information should be obtained from relevant NCAA rules committees.

Sport	Mandatory Protective Equipment*	Rules Governing Special Protective Equipment
1. Baseball	<ol style="list-style-type: none"> 1. A double ear-flap protective helmet while batting, on deck and running bases. Helmets must carry the NOCSAE mark. 2. All catchers must have a built-in or attachable throat guard on their masks. 3. All catchers are required to wear a protective helmet when fielding their position. 	None
2. Basketball	None	<p>Elbow, hand, finger, wrist or forearm guards, casts or braces made of fiberglass, plaster, metal or any other nonpliable substance shall be prohibited. Pliable (flexible or easily bent) material covered on all exterior sides and edges with no less than 0.5-inch thickness of a slow-rebounding foam shall be used to immobilize and/or protect an injury. The prohibition of the use of hard-substance material</p>

Sport	Mandatory Protective Equipment*	Rules Governing Special Protective Equipment
Basketball (continued)		<p>does not apply to the upper arm, shoulder, thigh or lower leg if the material is padded so as not to create a hazard for other players.</p> <p>Equipment that could cut or cause an injury to another player is prohibited, without respect to whether the equipment is hard.</p> <p>Equipment that, in the referee’s judgment, is dangerous to other players, may not be worn.</p>
3. Fencing	<ol style="list-style-type: none"> 1. Masks with meshes (space between the wires) of maximum 2.1 mm and from wires with a minimum gauge of 1 mm diameter. 2. Gloves, of which the gauntlet must fully cover approximately half the forearm of the competitor’s sword arm. 3. Jacket or vest and metallic lames. 4. Ladies’ chest protectors made of metal or some other rigid material. 5. Underarm protector. 	
4. Field Hockey	<ol style="list-style-type: none"> 1. The following equipment is permitted for use only by goalkeepers: body and wrap-around throat protectors, pads, kickers, gauntlet gloves, helmet incorporating fixed full-face protection and cover for the head, and elbow pads. 2. Mouthguards for all players including goalkeepers. 3. Wrap-around throat protector and helmet for player designated as a “kicking back.” In the event of a defensive penalty corner, the “kicking back” must also wear a chest protector and distinguishing jersey. 	<p>Players shall not wear anything that may be dangerous to other players. Players have the option of wearing soft headgear subject to game official approval.</p>

Protective Equipment

Sport	Mandatory Protective Equipment*	Rules Governing Special Protective Equipment
5. Football	<ol style="list-style-type: none">1. Soft knee pads at least ½-inch thick that are covered by pants. It is strongly recommended that they cover the knees. No pads or protective equipment may be worn outside the pants.2. Face masks and helmets with a secured four- or six-point chin strap. All players shall wear helmets that carry a warning label regarding the risk of injury and a manufacturer's or reconditioner's certification indicating satisfaction of NOCSAE test standards.3. Shoulder pads, hip pads with tailbone protectors and thigh guards.4. An intra-oral mouthpiece of any readily visible color (not white or transparent) with FDA-approved base materials (FDACS) that covers all upper teeth. It is recommended that the mouthpiece be properly fitted.	<p>Illegal equipment includes the following:</p> <ol style="list-style-type: none">1. Equipment worn by a player, including artificial limbs, that would endanger other players.2. Hard, abrasive or unyielding substances on the hand, wrist, forearm or elbow of any player, unless covered on all exterior sides and edges with closed-cell, slow-recovery foam padding no less than ½-inch thick, or an alternate material of the same minimum thickness and similar physical properties. Hard or unyielding substances are permitted, if covered, only to protect an injury. Hand and arm protectors (covered casts or splints) are permitted only to protect a fracture or dislocation.3. Thigh guards of any hard substances, unless all surfaces are covered with material such as closed-cell vinyl foam that is at least ¼-inch thick on the outside surface and at least ⅜-inch thick on the inside surface and the overlaps of the edges; shin guards not covered on both sides and all edges with closed-cell, slow-recovery foam padding at least ½-inch thick, or an alternate material of the same minimum thickness having similar physical properties; and therapeutic or preventive knee braces, unless worn under the pants and entirely covered from direct external exposure.



Sport	Mandatory Protective Equipment*	Rules Governing Special Protective Equipment
Football (continued)		4. Projection of metal or other hard substance from a player's person or clothing.
6. Gymnastics	None	None
7. Ice Hockey	<ol style="list-style-type: none"> 1. Helmet with chin straps securely fastened. It is recommended that the helmet meet HECC standards. 2. An intra-oral mouthpiece that covers all the upper teeth. 3. Face masks that have met the standards established by the HECC-ASTM F 513-89 Eye and Face Protective Equipment for Hockey Players Standard. 	<ol style="list-style-type: none"> 1. The use of pads or protectors made of metal or any other material likely to cause injury to a player is prohibited. 2. The use of any protective equipment that is not injurious to the player wearing it or other players is recommended. 3. Jewelry is not allowed, except for religious or medical medals, which must be taped to the body.
8. Women's Lacrosse	<ol style="list-style-type: none"> 1. The goalkeeper must wear a helmet with face mask, separate throat protector, a mouth piece, a chest protector. 2. All field players shall wear properly an intra-oral mouthpiece that covers all upper teeth. 3. All field players shall wear protective eyewear that meets current ASTM lacrosse standards (effective January 1, 2005). 	Protective devices necessitated on genuine medical grounds must be approved by the umpires. Close-fitting gloves, nose guards, eye guards and soft headgear may be worn by all players. These devices must create no danger to other players.
9. Men's Lacrosse	<ol style="list-style-type: none"> 1. Protective helmet that carries the NOCSAE mark, equipped with face mask and chin pad, with a cupped four-point chin strap (high-point hookup). 2. Intra-oral mouthpiece that covers all the upper teeth and is yellow or any other highly visible color. 3. Protective gloves, shoulder pads, shoes and jerseys. Shoulder pads shall not be altered. 4. Throat protector and chest protector are required for the goalie. 	<ol style="list-style-type: none"> 1. A player shall not wear any equipment that, in the opinion of the official, endangers the individual or others. 2. The special equipment worn by the goalkeeper shall not exceed standard equipment for a field player, plus standard goalkeeper equipment, which includes shin guards, chest protectors and throat protectors.

Protective Equipment

Sport	Mandatory Protective Equipment*	Rules Governing Special Protective Equipment
10. Rifle	Shooters and range personnel in the immediate vicinity of the range required to wear hearing protection during smallbore. Shooters urged to wear shatterproof eye protection.	None
11. Soccer	Players shall wear shin guards under the stockings in the manner intended, without exception. The shin guards shall be professionally manufactured, age and size appropriate and not altered to decrease protection. The shin guards must meet NOCSAE standards.	<ol style="list-style-type: none"> 1. A player shall not wear anything that is dangerous to another player. 2. Knee braces are permissible provided no metal is exposed. 3. Casts are permitted if covered and not considered dangerous. 4. A player shall not wear any jewelry of any type whatsoever. Exception: Medical alert bracelets or neck laces may be worn but must be taped to the body.
12. Skiing	Helmets manufactured for ski racing are required in all Alpine events and event training.	None
13. Softball	<ol style="list-style-type: none"> 1. Catchers must wear foot-to-knee shin guards; NOCSAE-approved protective helmet with face mask and built-in or attachable throat guard; and chest protector. 2. A NOCSAE-approved double-ear flap protective helmet must be worn by players while batting, running the bases or warming-up in the on-deck circle. 	Casts, braces, splints and prostheses must be well-padded to protect both the player and opponent and must be neutral in color. If worn by pitcher, cannot be distracting on nonpitching arm. If worn on pitching arm, may not cause safety risk or unfair competitive advantage.
14. Swimming and Diving	None	None

Sport	Mandatory Protective Equipment*	Rules Governing Special Protective Equipment
15. Track and Field	None	<p>1. No taping of any part of the hand, thumb or fingers will be permitted in the discus and javelin throws, and the shot put, except to cover or protect an open wound. In the hammer throw, taping of individual fingers is permissible. Any taping must be shown to the head event judge before the event starts.</p> <p>2. In the pole vault, the use of a forearm cover to prevent injuries is permissible.</p>
16. Volleyball	None	<p>1. It is forbidden to wear any object that may cause an injury or give an artificial advantage to the player, including but not limited to headgear, jewelry and unsafe casts or braces. Religious medallions or medical identifications must be removed from chains and taped or sewn under the uniform.</p> <p>2. All jewelry must be removed. Earrings must be removed. Taping of earrings or other jewelry is not permitted.</p> <p>3. Hard splints or other potentially dangerous protective devices worn on the arms or hands are prohibited, unless padded on all sides with at least ½-inch thick of slow rebounding foam.</p>
17. Water Polo	Cap with protective ear guards.	None
18. Wrestling	Protective ear guard.	<p>1. Anything that does not allow normal movement of the joints and prevents one's opponent from applying normal holds shall be barred.</p> <p>2. Any legal device that is hard and abrasive must be covered and padded. Loose pads are prohibited. It is recommended that all wrestlers wear a protective mouth guard.</p> <p>3. Jewelry is not allowed.</p>

NCAA® GUIDELINE 3b

Eye Safety in Sports

January 1975 • Revised August 2001

Eye injuries in sports are relatively frequent, sometimes catastrophic, and almost completely preventable with the use of appropriate protective devices. A sports eye protector may be a spectacle, a goggle, a face-supported protector, or a protector attached to a helmet. It comes with or without lenses, is capable of being held securely in place, and may protect the face as well as the eyes. Some forms can be worn over regular glasses. Sports eye protectors are specially designed, fracture-resistant units that comply with the American Society for Testing and Materials (ASTM), or the National Operating Committee on Standards for Athletic Equipment (NOCSAE) standards for specific sports.

Approximately one-third of all persons participating in sports require corrective lenses to achieve the visual acuity necessary for proper and safe execution of their particular sports activity. Athletes who need corrective eyewear for participation should use lenses and frames that meet the appropriate safety standards. At this time, polycarbonate plastic is the only clear lens material that has been tested for sports and is recommended for all sports with the potential for impact. Other impact-resistant lens materials may be available in the near future. Contact lenses are not capable of protecting the eye from direct blows. Student-

athletes who wear contact lenses for corrective vision should wear appropriate sports safety eyewear for ocular protection.

The American Academy of Ophthalmology recommends that head, face and eye protection should be certified by either the Protective Eyewear Certification Council (PECC — www.protecteyes.org/), the Hockey Equipment Certification Council (HECC — www.hecc-hockey.org/), the National Operating Committee on Standards for Athletic Equipment (NOCSAE — www.nocsae.org/), or the Canadian Standards Association (CSA — www.csa-international.org/). The cited websites will have more specific information on these standards. Certification ensures that the protective device has been properly tested to current standards.

Protective eyewear should be considered for all sports that have a projectile object (ball/stick) whose size and/or speed could potentially cause ocular damage. Eye protection is especially important for functionally one-eyed sports participants (whose best corrected vision in their weaker eye is 20/40 or worse). Eye protection devices are designed to significantly reduce the risk of injury, but can never provide a guarantee against such injuries.

Summary

1. Appropriate for eye protection in sports:

- a. Safety sports eyewear that conforms to the requirements of the American Society for Testing and Materials (ASTM) Standard F803 for selected sports (racket sports, basketball, women's lacrosse, and field hockey).
- b. Sports eyewear that is attached to a helmet or is designed for sports for which ASTM F803 eyewear alone provides insufficient protection. Those for which there are standard specifications include: skiing (ASTM 659), and ice hockey (ASTM F513). Other protectors with NOCSAE standards are available for football and men's lacrosse.

2. Not appropriate for eye protection in sports:

- a. Streetwear (fashion) spectacles that conform to the requirements of American National Standards Institute (ANSI) Standard Z80.3.
- b. Safety eyewear that conforms to the requirements of ANSI Z87.1, mandated by OSHA for industrial and educational safety eyewear.

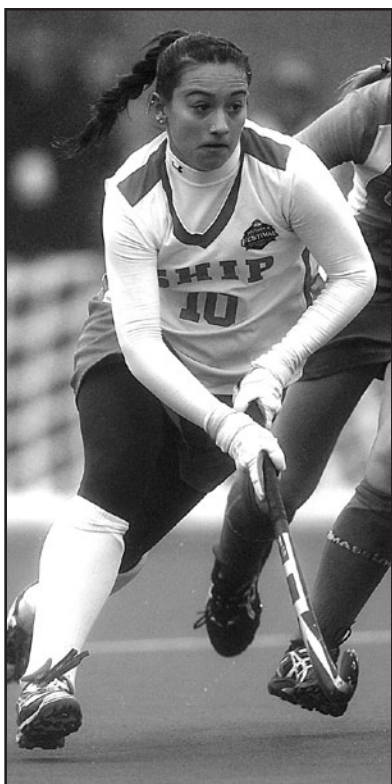


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Mouthguards

January 1986 • Revised August 2007



The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Dr. Jack Winters, past president of the Academy of Sports Dentistry, in the revision of this guideline.

The NCAA has mandatory equipment rules, including the use of mouthguards for selective sports. Various studies of “properly fitted mouthguards” indicate that they may reduce dental injuries when blows to the jaws or head are received.

The American Dental Association has urged the mandatory use of mouthguards for those engaged in athletics activities that involve body contact and endorsed their use “in sporting activities in which a significant risk of oral injury may occur.” It is important when considering the optimum protection for an athlete that a thorough medical history be taken and the demands of his or her position and sporting activity be considered.

Specific objectives for the use of “properly fitted mouthguards” as protective devices in sports are as follows:

1. “Properly fitted mouthguards” could reduce the potential chipping of tooth enamel surfaces and reduce fractures of teeth, roots or bones.

2. “Properly fitted mouthguards” could protect the lip and cheek tissues from being impacted and lacerated against tooth edges.

3. “Properly fitted mouthguards” could reduce the incidence of a fractured jaw caused by a blow delivered to the chin or head.

4. “Properly fitted mouthguards” could provide protection to toothless spaces, so support is given to the missing dentition of the student-athlete.

Stock, mouth-formed and custom-fitted are three types of mouthguards recognized by the American Dental Association. All need to be properly fitted for maximum protection. Student-athletes should be advised as to which “properly fitted mouthguard” is best for them and how it is best maintained to ensure the maximum fit and protection for daily practices and game-day wear. Medical staff personnel should regularly oversee and observe the student-athletes and the “properly fitted mouthguards.”

In order to realize fully the benefits of wearing a mouthguard, the coach, student-athlete and medical staff need to be educated about the protective functions of a mouthguard and the game rules regarding mouthguard use must be enforced.

Mouthguards

Sport	Position	Intra-oral Mouthguard	Color	Covers All Upper Teeth	When
Field Hockey	Field	Mandatory (NCAA Mod. 8.1.b); strongly recommended for goalkeepers	Not specified	Not specified	Regular Season Competition and NCAA Championships
Football	All	Mandatory (NCAA 1.4.4.d)	Readily Visible Color (not white or transparent)	Yes	Regular Season Competition, Postseason Competition and NCAA Championships
Ice Hockey	All	Mandatory (NCAA 3.2)	Recommended	Covers all the remaining teeth of one jaw.	Regular Season Competition and NCAA Championships
Women's Lacrosse	All	Mandatory (NCAA 2.8)	Not specified	Yes	Regular Season Competition and NCAA Championships
Men's Lacrosse	All	Mandatory (NCAA 1.20)	Yellow or any other visible color	Yes	Regular Season Competition and NCAA Championships

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Use of the Head as a Weapon in Football and Other Contact Sports

January 1976 • Revised June 2002

Head and neck injuries causing death, brain damage or paralysis occur each year in football and other sports. While the number of these injuries each year is relatively small, they are devastating occurrences that have a great impact. Most of these catastrophic injuries result from initiating contact with the head. The injuries may not be prevented due to the forces encountered during collisions, but they can be minimized by helmet manufacturers, coaches, players and officials complying with accepted safety standards and playing rules.

The American Football Coaches Association, emphasizing that the helmet is for the protection of the wearer and should not be used as a weapon, addresses this point as follows:

1. The helmet shall not be used as the

brunt of contact in the teaching of blocking or tackling;

2. Self-propelled mechanical apparatuses shall not be used in the teaching of blocking and tackling; and

3. Greater emphasis by players, coaches and officials should be placed on eliminating spearing.

Proper training in tackling and blocking techniques, including a “see what you hit approach,” constitutes an important means of minimizing the possibility of catastrophic injury. Using the helmet as an injury-

inflicting instrument is illegal, and should be strongly discouraged by coaches and game officials. This concern is not only in football, but also in other contact sports in which helmets are used (e.g., ice hockey and men’s lacrosse).

Football and all contact sports should be concerned with the prevention of catastrophic head injuries. The rules against butting, ramming and spearing with the helmet are for the protection of the helmeted player and the opponent. A player who does not comply with these rules in any sport is a candidate for a catastrophic injury.

1. NCAA Concussion Fact Sheets and Video

Available at www.NCAA.org/health-safety.

2. Heads Up: Concussion Tool Kit

CDC. Available at www.cdc.gov/ncipc/tbi/coaches_tool_kit.htm.

3. Heads Up Video

NATA. Streaming online at www.nata.org/consumer/headsup.htm.

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Guidelines for Helmet Fitting and Removal in Athletics

June 1990 • Revised June 2006

Several sports, including football, men's lacrosse and ice hockey, require wearing tight-fitting, similarly constructed helmets. The following guidelines, while focused on football, are applicable to periodic evaluation, fitting and removal of protective helmets worn in any sport. These guidelines represent minimal standards of care that are designed to assist physicians, coaches, athletic trainers, paramedics, EMTs and hospital personnel who care for student-athletes.

Medical coverage of interscholastic and intercollegiate teams entails many routine preventive and acute health-care duties for dedicated practicing professionals; however, an occasional, serious, on-the-field, life-threatening head and/or neck injury poses a difficult challenge. It is incumbent upon those individuals assigned to provide medical coverage to be prepared to handle each situation efficiently and expertly.

Proper on-the-field management of head and neck injuries is essential to minimize sequelae, expedite emergency measures and to prepare for transportation. The action of those in attendance must not compound the problem. For this reason, clear communication

between the medical staff and emergency-transportation personnel should be maintained. It is important that those involved in the medical management of teams engaged in collision and contact sports, and the student-athlete be knowledgeable about the helmet. The student-athlete should be instructed in the fitting, care and use of the helmet. Helmet manufacturer guidelines should be reviewed and followed for proper fitting and care techniques.

The resilient plastic shell is shaped spherically to deflect impacts. Interior suspension pads are designed to match the skull contour to ensure a snug crown fit. Various rigid and removable jaw and brow pads, along with the chin strap, help to hold the sides of the helmet firmly against the mandible and the forehead. When in place, the front edge of the helmet should be positioned about a finger's breadth above the eyebrows. Pressure on the helmet crown should be dissipated through the interior suspension padding over the top of the head.

The helmet should fit snugly without dependence on the chin strap. The helmet should not twist or slide when an examiner grasps the face mask and attempts to rock

or turn the helmet with the wearer resisting the movement.

With a properly fitted helmet, the top of the head is separated from the helmet shell by a uniform, functional, shock-absorbing support lining. Daily evaluation of this support mechanism, including cheek and brow pads, for placement and resiliency should be taught to the student-athlete. Helmets that require air inflation should be inflated and inspected daily by the student-athlete. Helmet shells should be examined weekly for cracking and be inspected closely again if the face mask has been bent out of shape. All helmets need to be reconditioned and the attachments of the mask replaced on a yearly basis.

Although the helmet is designed for a stable fit for protection during play, removal of the helmet by others is relatively difficult. In the case of a head or neck injury, jostling and pulling during removal presents high potential for further trauma.

Unless there are special circumstances such as respiratory distress coupled with an inability to access the airway, the helmet should never be removed during the pre-hospital

Guidelines for Helmet Fitting and Removal in Athletics

care of the student-athlete with a potential head/neck injury unless:

1. The helmet does not hold the head securely, such that immobilization of the helmet does not immobilize the head;
2. The design of the sport helmet is such that even after removal of the facemask, the airway cannot be controlled or ventilation provided;
3. After a reasonable period of time, the facemask cannot be removed; or
4. The helmet prevents immobilization for transportation in an appropriate position.

When such helmet removal is necessary in any setting, it should be performed only by personnel trained in this procedure.

Ordinarily, it is not necessary to remove the helmet on the field to evaluate the scalp. Also, the helmet can be left in place when evaluating an unconscious student-athlete, an individual who demonstrates transient or persistent neurological findings in his/her extremities, or the student-athlete who complains of continuous or transient neck pain.

Before the injured student-athlete is moved, airway, breathing and circulation (ABCs) should be evaluated by looking, listening and palpation. To monitor breathing, care for facial injury, or before transport regardless of current respiratory status, the facemask should be removed by cutting or unscrewing the loops that attach the mask to the helmet. These loops may be difficult to cut,

necessitating the use of PVC pipe cutters, garden shears or a screwdriver. Those involved in the pre-hospital care of the injured student-athlete should have readily available proper tools for easy facemask removal and should frequently practice removal techniques for facemasks and helmets. It should be noted that cold weather and old loops may make cutting difficult. The chin strap can be left in place unless resuscitative efforts are necessary. For resuscitation, the mouthpiece needs to be manually removed.

Once the ABCs are stabilized, transportation to an emergency facility should be conducted with the head secure in the helmet and the neck immobilized by strapping, taping and/or using lightweight bolsters on a spine board. When moving an athlete to the spine board, the head and trunk should be moved as a unit, using the lift/slide maneuver or a log-roll technique.

At the emergency facility, satisfactory initial skull and cervical X-rays usually can be obtained with the helmet in place. Should removal of the helmet be needed to initiate treatment or to obtain special X-rays, the following protocol should be considered:

- With the head, neck and helmet manually stabilized, the chin strap can be cut.
- While maintaining stability, the cheek pads can be removed by slipping the flat blade of a screwdriver or bandage scissor under the pad snaps and above the inner surface of the shell.
- If an air cell-padding system is present, it can be deflated by releasing the air at the external port with an inflation needle or large-gauge hypodermic needle.

- By rotating the helmet slightly forward, it should now slide off the occiput. If the helmet does not move with this action, slight traction can be applied to the helmet as it is carefully rocked anteriorly and posteriorly, with great care being taken not to move the head/neck unit.
- The helmet should not be spread apart by the earholes, as this maneuver only serves to tighten the helmet on the forehead and on the occipital regions.
- All individuals participating in this important maneuver must proceed with caution and coordinate every move.

If the injured student-athlete, after being rehabilitated fully, is allowed to participate in the sport again, refitting his/her helmet is mandatory. Re-education about helmet use as protection should be conducted. **Using the helmet as an offensive, injury-inflicting instrument should be discouraged.**

Guidelines for Helmet Fitting and Removal in Athletics



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NCAA® **GUIDELINE 3f**

Use of Trampoline and Minitramp

June 1978 • Revised June 2002

The NCAA recognizes that the coaches and student-athletes in selected sports use the trampoline and minitramp for developing skills. The apparent safety record accompanying such use has been good, but the use of the trampoline can be dangerous. Therefore, these guidelines should be followed in those training activities in which student-athletes use the trampoline:

1. Trampolines should be supervised by persons with competence in the use of the trampoline for developing athletics skills. This implies that:

a. Fellow coaches, student-athletes, managers, etc., are trained in the principles and techniques of spotting with the overhead harness, “bungee system” and/or hand spotting on the trampoline;

b. New skills involving somersaults should be learned while wearing an overhead safety harness. (Exception: Use of the overhead system is not recommended for low-level salto activities such as saltos from the knees or back.) Those

persons controlling the safety harness should have the necessary strength, weight and training for that responsibility;

c. Skills being encouraged should be commensurate with the readiness of the student-athlete, and direct observation should confirm that the student-athlete is not exceeding his or her readiness; and

d. Spotters are aware of the particular skill or routine being practiced and are in an appropriate position to spot potential errors. Accurate communication is important to the successful use of these techniques.

2. Potential users of the trampoline should be taught proper procedures for folding, unfolding, transporting, storing and locking the trampoline.

3. The trampoline should be erected in accordance with manufacturer’s instructions. It should be inspected regularly and maintained according to established standards. All inspection reports, including the date of inspection

and name of inspector, should be kept on file.

Minitramp

The minitramp, while different in nature and purpose from the trampoline, shares its association with risk of spinal cord injury from poorly executed and/or spotted tricks. Like the trampoline, the minitramp requires competent instruction and supervision, spotters trained for that purpose (spotting somersaults on the minitramp differs from the trampoline because of the running action preceding the somersault), emphasis on the danger of somersaults and dive rolls, security against unsupervised use, proper erection and maintenance of the apparatus, a planned procedure for emergency care should an accident occur, and documentation of participation and any accidents that occur. In addition, no single or multiple somersault should be attempted unless:

1. The student-athlete has demonstrated adequate progression of skill before attempting any

Use of Trampoline and Minitramp

somersault (i.e., on the trampoline with a safety harness, off a diving board into a swimming pool or tumbling with appropriate spotting);

2. One or more competent spotters who know the skill being attempted are in position and are physically capable of spotting an improper execution;

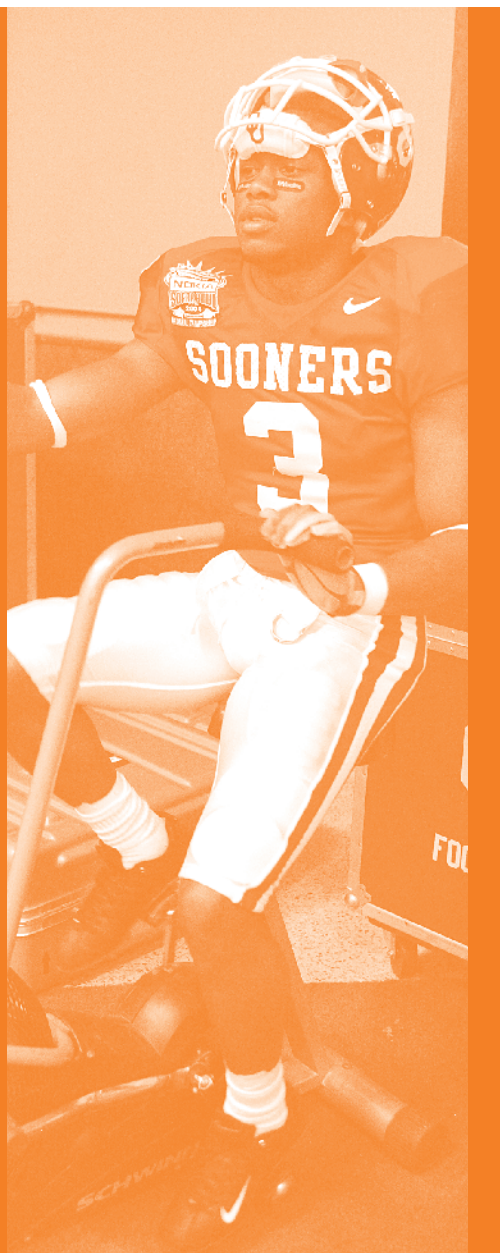
3. The minitramp is secured reasonably or braced to prevent slipping at the time of execution in accordance with recommendations in the USA Gymnastics Safety Handbook; and

4. A mat is used that is sufficiently wide and long to prevent the performer from landing on the mat's edge and to provide proper footing for the spotter(s).



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Appendixes

Also found on the NCAA website at: NCAA.org/health-safety

NCAA® Appendix A

2011-12 NCAA

Banned Drugs

The NCAA bans the following classes of drugs:

- a. Stimulants;
- b. Anabolic Agents;
- c. Alcohol and Beta Blockers (banned for rifle only);
- d. Diuretics and Other Masking Agents;
- e. Street Drugs;
- f. Peptide Hormones and Analogues;
- g. Anti-Estrogens; and
- h. Beta-2 Agonists.

Note: Any substance chemically related to these classes is also banned. The institution and the student-athlete shall be held accountable for all drugs within the banned-drug class regardless of whether they have been specifically identified.

Drugs and Procedures Subject to Restrictions:

- Blood Doping.
- Local Anesthetics (under some conditions).
- Manipulation of Urine Samples.
- Beta-2 Agonists permitted only by prescription and inhalation.
- Caffeine – if concentrations in urine exceed 15 micrograms/ml.

NCAA Nutritional/Dietary Supplements Warning:

- **Before consuming any nutritional/dietary supplement product, review the product and its label with your athletics department staff!**
- Dietary supplements are not well regulated and may cause a positive drug test result.
- Student-athletes have tested positive and lost their eligibility using dietary supplements.
- Many dietary supplements are contaminated with banned drugs not listed on the label.
- **Any product containing a dietary supplement ingredient is taken at your own risk.**

Information about ingredients in medications and nutritional/dietary supplements can be obtained by **contacting the Resource Exchange Center (REC) at 877/202-0769 or www.drugfreesport.com/rec (password ncaa1, ncaa2 or ncaa3).**

NCAA® Appendix B

NCAA Legislation Involving Health and Safety Issues

This chart should be used as a quick reference for NCAA legislation involving health and safety issues that appears in the 2011-12 NCAA Divisions I, II and III Manuals. The comment section does not capture the full scope of the legislation; users are encouraged to review the full bylaw in the appropriate divisional manual. Because of the dynamic nature of the NCAA legislative process, the most current information on these and any new legislation should be obtained through the institution's athletics department compliance staff.

Regulations Involving Health and Safety Issues

Topic	Issue	NCAA Bylaw Cite	Comments
Banned Drugs	List of Banned Drug Classes	31.2.3.4	Lists all drug classes currently banned by the NCAA.
	Drugs and Procedures Subject to Restrictions	31.2.3.4.1	List of drugs and procedures that are restricted.
	Effect on Eligibility	18.4.1.5	A positive test for use of a banned (performance enhancing or "street") substance results in loss of eligibility.
	Effect on Championship Eligibility	18.4.1.5	A positive test for a banned (performance enhancing or "street") substance results in loss of eligibility, including eligibility for participation in postseason competition.
	Transfer While Ineligible Due to Positive Drug Test	13.1.1.3.5 (Div. I), 13.1.1.2.4 (Div. II), 13.1.1.2.6 (Div. III)	Institution at which student-athlete tested positive for use of a banned substance must report the test result to the institution to which the student-athlete is transferring.
	Knowledge of Use of Banned Drugs	10.2	Athletics department staff members or others employed by intercollegiate athletics department with knowledge of a student-athlete's use of a banned substance must follow institutional policies.
	Athletics Department Resource for Banned Drugs and Nutritional Supplements	3.2.4.7 (Div. I)	Institutions must designate an individual (or individuals) as an athletics department resource for questions related to NCAA banned drugs and nutritional supplements.

NCAA Legislation Involving Health and Safety Issues

Drug Testing	Banned Drugs and Drug-Testing Methods	18.4.1.5.2	NCAA Executive Committee is charged with developing a list of banned substances and approving all drug-testing procedures.
	Consent Form: Content and Purpose	14.1.4.1	Consent must be signed before competition or practice or before the Monday of fourth week of classes. Failure to sign consent results in loss of eligibility.
	Consent Form: Administration	14.1.4.2, 3.2.4.7 (Div. I); 14.1.4.2, 3.2.4.6 (Div. II); 14.1.4.3, 3.2.4.6 (Div. III)	Institution must administer consent form to all student-athletes each academic year at the time the intercollegiate squads report for practice. At this time, institutions must also distribute to student-athletes the list of banned drug classes.
	Consent Form: Exception, 14-Day Grace Period	14.1.4.3 (Div. I) 14.1.4.2 (Div. II)	Student-athletes who are trying out must sign the form within 14 days of the first athletics-related activity or before they compete, whichever occurs first.
	Effect of Non-NCAA Athletics Organization's Positive Drug Test	18.4.1.5.3	A student-athlete under a drug-test suspension from a national or international sports governing body shall not compete in NCAA intercollegiate competition.
	Failure To Properly Administer Drug-Testing Consent Form (Div. I and Div. II only)	14.1.4.4	Failure to properly administer drug-testing consent form is considered an institutional violation.
Drug Rehabilitation	Drug Rehabilitation Program Expenses	16.4.1 (Div. I and Div. II), 16.4 (Div. III)	Permissible for institution to cover the costs of a student-athlete's drug rehabilitation program.
	Travel To and From Drug Rehabilitation Program	16.12.1	Permissible to file a waiver under Bylaw 16.12.1 to cover costs associated with a drug rehabilitation program.
Nutritional Supplements	Permissible Supplements	16.5.2(g) (Div. I), 16.5.1(h) (Div. II)	Institution may provide only permissible nutritional supplements that do not contain any NCAA banned substances. See Bylaw for details.

NCAA Legislation Involving Health and Safety Issues

Tobacco Use	Restricted Advertising and Sponsorship Activities	31.1.14.1 (Div. I), 31.1.12.1 (Div. II) 31.1.11.1 (Div. III)	No tobacco advertisements in, or sponsorship of, NCAA championships or regular-season events.
	Tobacco Use at Member Institution	11.1.5 (Div. I and Div. II), 17.1.8 (Div. I), 17.1.9 (Div. II), 17.1.11 (Div. III)	Use of tobacco products is prohibited by all game personnel and all student-athletes in all sports during practice and competition.
Medical Expenses	Permissible Medical Expenses	16.4.1 (Div. I and Div. II), 16.4 (Div. III)	Permissible medical expenses are outlined. If expense is not on the list, refer to Bylaw 16.12.1 for waiver procedure.
	Eating Disorders (Div. I and Div. II only)	16.4.1	Institution may cover expenses of counseling related to the treatment of eating disorders.
	Transportation for Medical Treatment (Div. I and Div. II only)	16.4.1	Institution may cover or provide transportation to and from medical appointments.
	Summer Conditioning - Football	13.2.7	Institution may finance medical expenses for a prospect who sustains an injury while participating in nonmandatory summer conditioning activities that are conducted by an institution's strength and conditioning coach.
	Summer Conditioning - Sports other than Football (Div. I only)	13.2.8	
Medical Waivers	Hardship Waiver	14.2.4 (Div. I), 14.2.5 (Div. II and Div. III)	Under certain circumstances, a student-athlete may be awarded an additional season of competition to compensate for a season that was not completed due to incapacitating injury or illness.
	Five-Year/10-Semester Rule Waiver	14.2.1.5.1 (Div. I), 14.2.2.3 (Div. II) 14.2.2.4 (Div. III)	Under certain circumstances, a student-athlete may be awarded an additional year of eligibility if he or she was unable to participate in intercollegiate athletics due to incapacitating physical or mental circumstances.
Medical Records and Consent Forms	HIPAA/Buckley Amendment Consent Forms	3.2.4.9, 14.1.6 (Div. I); 3.2.4.7, 14.1.5 (Div. II); 3.2.4.7, 14.1.6 (Div. III)	The authorization/consent form shall be administered individually to each student-athlete by the athletics director or the athletics director's designee before the student-athlete's participation in intercollegiate athletics each academic year. Signing the authorization/consent shall be voluntary and is not required by the student-athlete's institution for medical treatment, payment for treatment, enrollment in a health plan or for any benefits (if applicable) and is not required for the student-athlete to be eligible to participate. Any signed authorization/consent forms shall be kept on file by the director of athletics.

NCAA Legislation Involving Health and Safety Issues

Student-Athlete Welfare and Safety	Time Restrictions on Athletics-Related Activities (Div. I and Div. II only)	17.1.6	All NCAA sports are subject to the time limitations in Bylaw 17.
	Daily/Weekly Hour Limitation – Inside Playing Season (Div. I and Div. II only)	17.1.6.1	During the playing season, a student-athlete cannot engage in more than 20 hours of athletics-related activity (see Bylaw 17.02.1) per week, with not more than four hours of such activity in any one day.
	Weekly Hour Limitations – Outside Playing Season (Div. I and Div. II only)	17.1.6.2	Outside of the playing season, student-athletes cannot engage in more than eight hours of conditioning activities per week.
	Skill Instruction Exception (Div. I and Div. II only) See Bylaws 17.1.6.2.2 and 17.1.6.2.3 (Div. I) for additional exceptions.	17.1.6.2.2, 17.1.6.2.3 (Div. I), 17.1.6.2, 17.1.6.2.1 (Div. II)	Outside of the playing season, two of the student-athlete's eight hours of conditioning activity may be skill-related instruction with coaching staff.
	Required Day Off – Playing Season	17.1.6.4 (Div. I and Div. II), 17.1.6 (Div. III)	During the playing season, each student-athlete must be provided with one day per week on which no athletics-related activities are scheduled.
	Required Days Off – Outside Playing Season (Div. I and Div. II only)	17.1.6.5	Outside the playing season, each student-athlete must be provided with two days per week on which no athletics-related activities are scheduled.
	Voluntary Summer Conditioning (Div. I only)	13.11.3.8 (basketball)	Prospective student-athletes, who signed an NLI or enrolled in the institution's summer term prior to initial, full-time enrollment, may engage in voluntary summer workouts conducted by an institution's strength and conditioning coach with department-wide duties.
	Voluntary Summer Conditioning (Div. I only)	13.11.3.7 (football)	Prospective student-athletes, who signed an NLI or enrolled in the institution's summer term prior to initial, full-time enrollment, may engage in voluntary summer workouts conducted by an institution's strength and conditioning coach with department-wide duties (FBS) or a countable coach who is a certified strength and conditioning coach (FCS).

NCAA Legislation Involving Health and Safety Issues

Student-Athlete Welfare and Safety	Voluntary Summer Conditioning (Div. I only)	13.11.3.9 (Sports Other Than Football and Basketball)	In sports other than football and basketball, a prospective student-athlete may engage in voluntary summer workouts conducted by an institution's strength and conditioning coach with department-wide duties and may receive workout apparel (on an issuance and retrieval basis), provided he or she is enrolled in the institution's summer term prior to the student's initial full-time enrollment at the certifying institution. Such a prospective student-athlete may engage in such workouts only during the period of the institution's summer term or terms (opening day of classes through last day of final exams) in which he or she is enrolled.
	Voluntary Weight-Training or Conditioning Activities (Div. I only)	13.11.3.9.4	A strength and conditioning coach who conducts voluntary weight-training or conditioning activities is required to maintain certification in first aid and cardiopulmonary resuscitation. If a member of the institution's sports medicine staff (e.g., athletic trainer, physician) is present during voluntary conditioning activities conducted by a strength and conditioning coach, the sports medicine staff member must be empowered with the unchallengeable authority to cancel or modify the workout for health and safety reasons, as he or she deems appropriate.
	Sports-Safety Training	11.1.6 (Div. II)	Each head coach and all other coaches who are employed full time at an institution shall maintain current certification in first aid, cardiopulmonary resuscitation (CPR) and automatic external defibrillator (AED) use.
		11.1.6 (Div. III)	Each head coach shall maintain current certification in first aid, cardiopulmonary resuscitation (CPR) and automatic external defibrillator (AED) use.
	Discretionary Time (Div. I only)	17.02.14	Student-athletes may only participate in athletics activities at their initiative during discretionary time.
Mandatory Medical Examinations	17.1.5	All student-athletes beginning their initial season of eligibility and students who are trying out for a team must undergo a medical exam before they are permitted to engage in any physical activity. The exam must take place within six months before the physical activity. Each subsequent year, an updated medical history must be administered by an institutional medical staff member.	

NCAA Legislation Involving Health and Safety Issues

Student-Athlete Welfare and Safety	Mandatory Medical Examinations	17.1.5.1 (Div. I)	The examination or evaluation of student-athletes who are beginning their initial season of eligibility and students who are trying out for a team shall include a sickle cell solubility test, unless documented results of a prior test are provided to the institution or the prospective student-athlete or student-athlete declines the test and signs a written release.
	Five-Day Acclimatization Period – Football	17.9.2.3 (Div. I), 17.9.2.2 (Div. II and Div. III)	Five-day acclimatization for conducting administrative and initial practices is required for first-time participants (freshmen and transfers) and continuing student-athletes.
	Preseason Practice Activities – Football	17.9.2.4 (Div. I), 17.9.2.3 (Div. II and Div. III)	Preseason practice time limitations and general regulations.
	Out-of-Season Athletics-Related Football Activities	17.9.6 (Div. I and Div. III), 17.9.8 (Div. II)	Permissible summer conditioning activities.
	Sports-Specific Safety Exceptions (Equestrian; Fencing; Gymnastics; Rifle; Women’s Rowing; Skiing; Swimming; Track and Field; Water Polo; and Wrestling.) (Div. I and Div. II only)	13.11.3.10 (Div. I); 17.6.7; 17.7.7; 17.11.7; 17.14.7; 17.15.7 (Div. I); 17.15.9 (Div. II); 17.18.7; 17.24.7 (Div. I); 17.24.8 (Div. II); 17.26.8; 17.27.7 (Div. I and Div. II)	A coach may be present during voluntary individual workouts in the institution’s regular practice facility (without the workouts being considered as countable athletics-related activities) when the student-athlete uses sport-specific equipment. The coach may provide safety or skill instruction but cannot conduct the individual’s workouts.
	Playing Rules Oversight Panel	21.1.4	The panel shall be responsible for resolving issues involving player safety, financial impact or image of the game.
	Concussion Management Plan	3.2.4.17 (Div. I and Div. II); 3.2.4.16 (Div. III)	Institutions must have a concussion management plan for student-athletes. See Guideline 2i.

NCAA Injury Surveillance Program Summary

The NCAA Injury Surveillance Program was developed in 1982 to provide current and reliable data on injury trends in intercollegiate athletics. It collects injury and activity information in order to identify and highlight potential areas of concern and interest related to student-athlete health and safety.

Injury data are collected yearly by the Datalys Center from a sample of NCAA member institutions, and the resulting data summaries are reviewed by the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports. The committee's goal continues to be to reduce injury rates through suggested changes in rules, protective equipment or coaching techniques, based on the data.

In some instances, the evaluation of the injury surveillance information has led the NCAA to commission research studies to better understand the underlying factors that have contributed to the observed surveillance findings. To support the objective and nature of the NCAA's Injury Surveillance Program – monitoring to identify areas of concern for potential further investigation – the Datalys Center does not collect identifiable information or treatment information.

Program Benefits

Participation in the NCAA's Injury

Surveillance Program supports rule and policy changes that improve student-athlete health and safety. In addition, program participation provides a number of benefits to athletic trainers and their institutions:

Safer participation in collegiate sports. In some cases, surveillance information has led to a mitigation of injuries and treatments (e.g., heat illness episodes).

Resource Justification and Allocation. Surveillance information has been used in the NATA's Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics (AMCIA) document.

Supports Clinical Best Practices. Regional and national injury rate comparisons allow a university to explore relevant clinical best practices with appropriate peer groups.

Supports Risk Management Best Practice. The electronic documentation of injuries (e.g., through an Export Engine Certified vendor or the Injury Surveillance Tool) is a recognized risk management best practice.

Facilitates Paper Record Keeping Processes. For institutions managing their health records via a paper process, the Injury Surveillance Tool facilitates the workflow and supports an enhanced level of documentation and record keeping.

Two easy ways to participate:

The Injury Surveillance Tool (IST) facilitates the workflow in the athletic training room and supports an enhanced level of documentation and record keeping. The IST is designed as a free injury incident report, and allows documentation of injuries. In doing so, the IST provides important injury information to the Datalys Center and helps to initiate a paper record keeping process for the athletic trainer.

The Export Engine Program (EE) is a public data transmission standard that commercial vendors can voluntarily adopt. Through the Export Engine Program, athletic trainers can directly and easily submit data from their vendor systems to the Injury Surveillance Program. If you are considering a new system, be sure to look for the Datalys Certified logo. Its certified vendors currently include ATS, Nextt Solutions and SIMS.

Data Availability and Access. Injury surveillance data collected through the NCAA's Injury Surveillance Program is available to the public through the Datalys Injury Statistics Clearinghouse (DISC), a web-based research portal. DISC provides a searchable Document Library for published reports and data on sports injuries. DISC also provides an interactive Query Tool for public use that

NCAA Injury Surveillance System Summary

allows registered users to interactively query available datasets for summary information, such as national injury rates, injury rates by sports, and injury rates by type of injury. DISC will be launched in the fall of 2010 and can be found at www.disc.datalyscenter.org.

Sampling

Since its inception, the surveillance program has depended on a volunteer “convenience sample” of reporting schools. Participation is available to the population of institutions sponsoring a given sport. Schools qualifying for inclusion in the final sample are selected from the total participating schools for each NCAA sport, with the goal of representation of all three NCAA divisions. A school is selected as qualifying for the sample if they meet the minimum standards for data collection.

It is important to recognize that this system does not identify every injury that occurs at NCAA institutions in a particular sport. Rather, the emphasis is collecting all injuries and exposures from schools that voluntarily participate in the Injury Surveillance Program. The Injury Surveillance Program attempts to balance the dual needs of maintaining a reasonably representative cross-section of NCAA institutions while accommodating the needs of the voluntary participants.

Injuries

A reportable injury in the Injury Surveillance Program is defined as one that:

1. Occurs as a result of participation in an organized intercollegiate practice or competition; and
2. Requires medical attention by a team athletic trainer or physician regardless of time loss.



Exposures (Activity)

An athlete exposure is defined as one athlete participating in one practice or competition in which he or she is exposed to the possibility of athletics injury.

Injury Rate

An injury rate is simply a ratio of the number of injuries in a particular category to the number of athlete exposures in that category. This value is expressed as injuries per 1,000 athlete exposures.

Historical Data

The NCAA published 16 years of injury data in 15 sports in the *Journal of Athletic Training National Collegiate Athletic Association Injury Surveillance, 1988-1989 Through 2003-2004*. *J Athl Train.* 2007;42(2).

All Sports Figures

The following figures outline selected information from the sports currently reported by the NCAA Injury Surveillance Program from 2004 to 2009. Complete summary reports for each sport are available online at www.disc.datalyscenter.org.

Any questions regarding the NCAA Injury Surveillance Program or its data reports should be directed to:

Megan McGrath, Manager of Collegiate Engagement, Datalys Center for Sports Injury Research and Prevention, Indianapolis, Indiana (317/275-3665).

David Klossner, Director of Student-Athlete Affairs, NCAA, P.O. Box 6222, Indianapolis, Indiana 46206-6222 (317/917-6222).

Figure 1
Competition and Practice Injury Rates Summary (25 Sports)

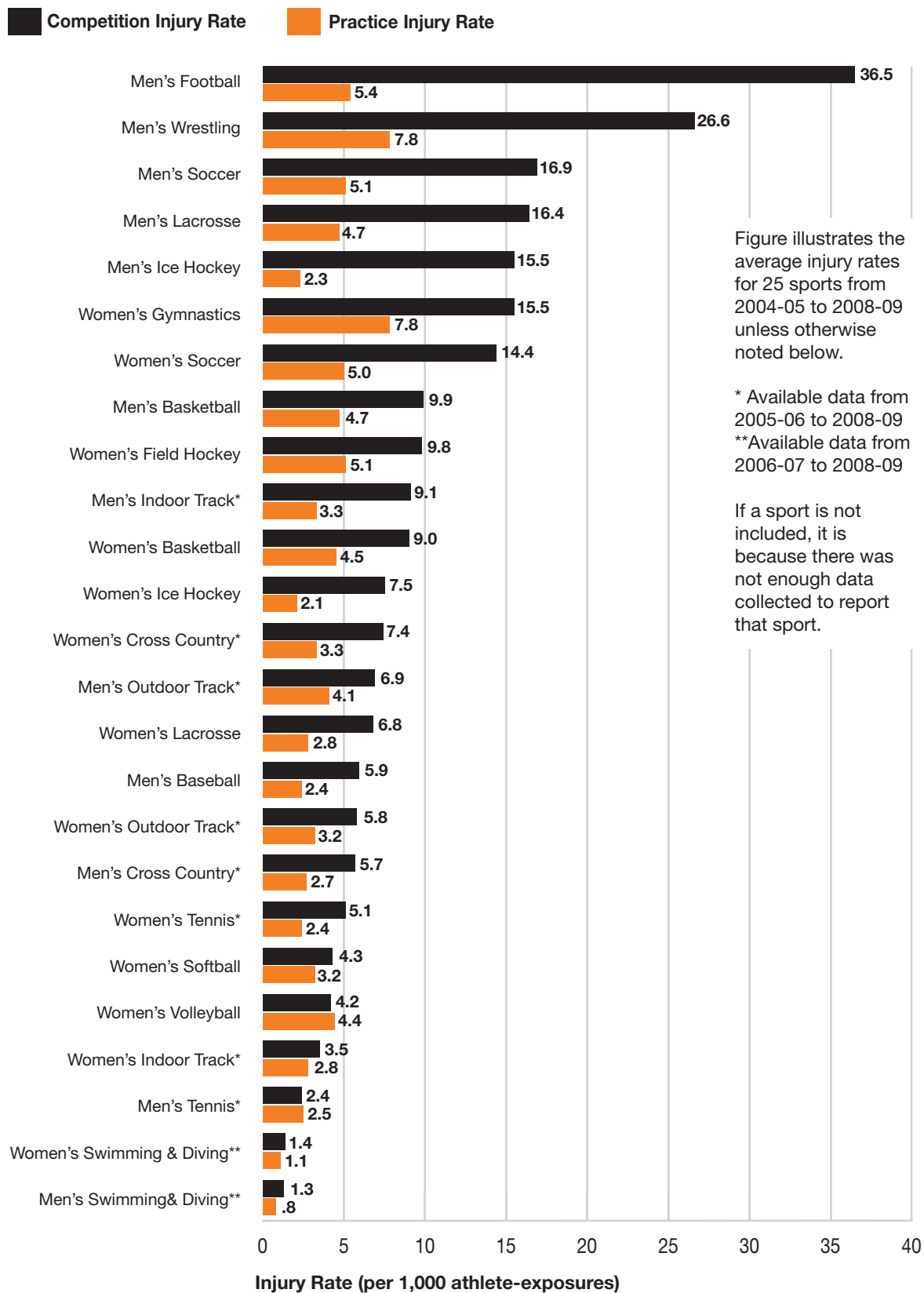


Figure illustrates the average injury rates for 25 sports from 2004-05 to 2008-09 unless otherwise noted below.

* Available data from 2005-06 to 2008-09

** Available data from 2006-07 to 2008-09

If a sport is not included, it is because there was not enough data collected to report that sport.

Figure 2
Percentage of All Injuries Occurring in Practices and Competition

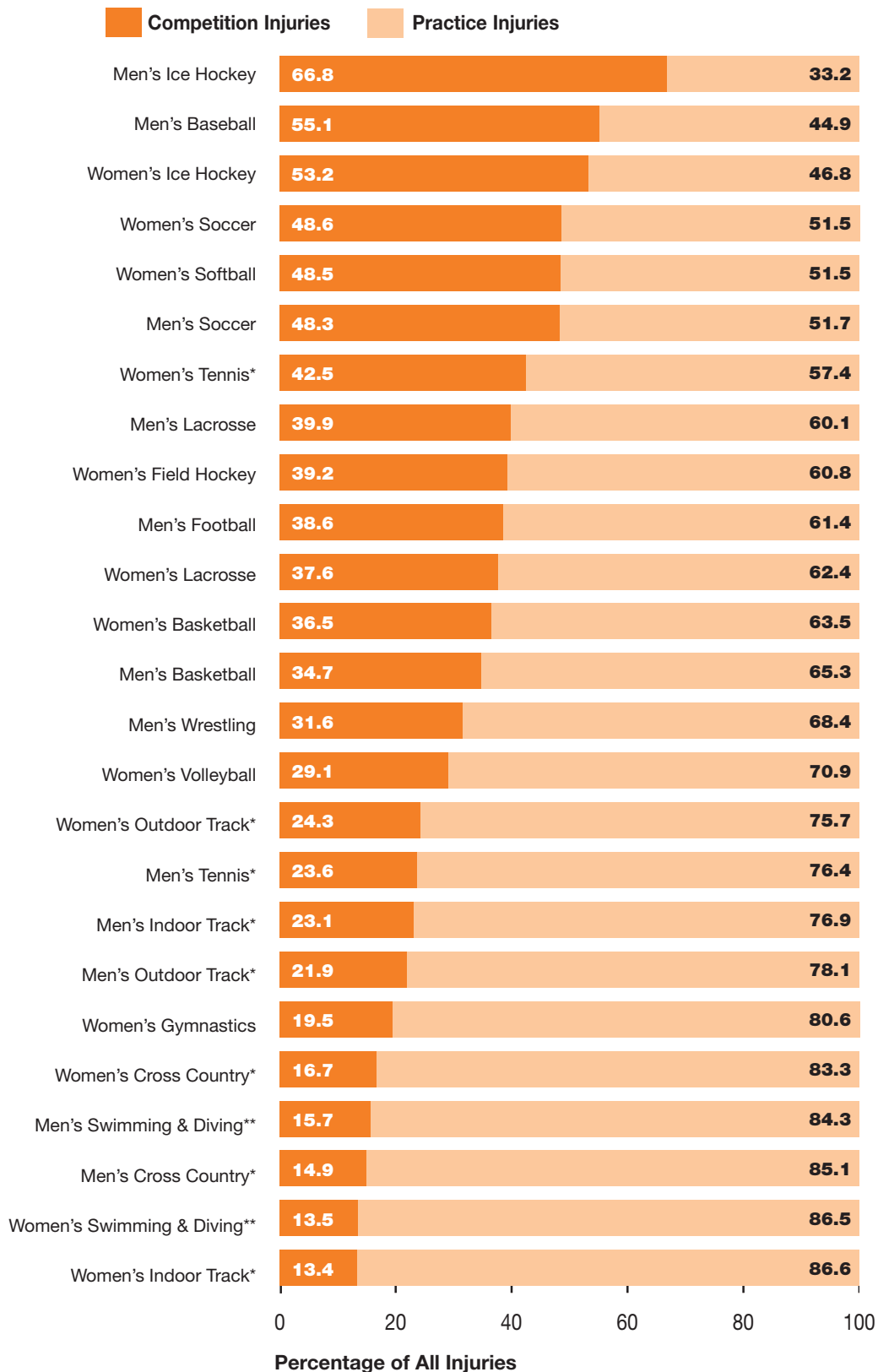


Figure represents the national estimates of injury percentages for 25 sports from 2004 to 2009 unless otherwise noted below.

* Sports with data from 2005-06 to 2008-09 (4 years only).

**Sports with data from 2006-07 to 2008-09 (3 years only).

If a sport is not included in the figure, it is because there was not enough data collected to report on that sport.

NCAA® Appendix D

Acknowledgements

From 1974 to 2011, the following individuals have served on the NCAA Committee on Competitive Safeguards and Medical Aspects of Sports and contributed to the information in the NCAA Sports Medicine Handbook:

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