



2014-15 NCAA[®] Sports Medicine Handbook





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P.O. Box 6222
Indianapolis, Indiana 46206-6222
317/917-6456
NCAA.org

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Compiled By: John T. Parsons, Ph.D., ATC, Director,
NCAA Sport Science Institute.

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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 people 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 teal 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, in conjunction with the NCAA Sport Science Institute, 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 for developing sports medicine policies appropriate for its intercollegiate athletics 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 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 athletic 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 team physicians, 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, as well as to 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.

2014-15

SPORTS MEDICINE GUIDELINES

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Limited revisions are highlighted within the specific guideline.

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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, in conjunction with the NCAA Sport Science Institute, 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 adequately inform 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 people 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.

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ADMINISTRATIVE ISSUES



GUIDELINE 1A

SPORTS MEDICINE ADMINISTRATION

October 1977 • Revised July 2013, July 2014

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 must be evaluated by qualified medical personnel. Such an examination should determine whether the student-athlete is medically cleared to engage in a particular sport.

Divisions I, II and III require student-athletes new to their campus to complete a sickle cell solubility test, to show results of a prior test or to 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 NCAA bylaws).

- 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 11, 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. Safe Environments.** Member institutions should support a positive student-athlete development model through respect and sportsmanship. Each student-athlete should be afforded a reasonably safe environment protected from personal endangerment such as abuse (physical, sexual, emotional), assault, hazing or harmful punishment. Policies and procedures should be in place to immediately identify, report and protect individuals reporting

incidents of endangerment. Staff and students reporting such behaviors and incidents should be protected from any negative repercussion. These policies should govern student-to-student, coach-athlete and staff-athlete interaction.

In the interest of the health and welfare of collegiate student-athletes, a student-athlete's health care providers must have clear authority for student-athlete care. Moreover, institutions should strive to adhere to the principles identified in the 2014 Inter-Association Consensus: Independent Medical Care for College Student-Athletes Guidelines (See Appendix C)

- 7. 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.
- 8. 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.

- 9. 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:

- Be informed what equipment is mandatory and what constitutes illegal equipment;
- 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.
- 10. 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. Athletic training facilities should adhere to local, state and federal regulations pertaining to health care facilities. A new Board of Certification Facilities best practices has been published.
- 11. 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.
- 12. Security and Safety Plan.** NCAA member institutions should develop a critical response plan to provide facility, staff and fan safety for potential incidents such as bombings, riots, fire, natural disasters, terrorism threats, etc.
- 13. Emergency Care.** NCAA member institutions should have on file and annually update an emergency action plan for each athletics venue (see Guideline 1C).
- 14. Catastrophic Incident Plan.** NCAA member institutions should develop a catastrophic incident guideline to provide a response plan and support that is necessary during and after a catastrophe such as death or permanent disability during an intercollegiate athletics-sponsored activity (see Guideline 1F).
- 15. Concussion Management Plan.** NCAA member institutions must have a concussion management plan for their student-athletes on file with specific components as described in NCAA bylaws (see Guideline 2I).
- 16. Drug Testing.** NCAA member institutions are responsible for ensuring compliance with NCAA drug testing program requirements (see NCAA Drug Testing Program book, NCAA bylaws, and Appendixes A and B).
- 17. 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).

GUIDELINE 1B

**INTERDISCIPLINARY
HEALTH CARE TEAMS**

July 2013 • Revised July 2013, July 2014

In July 2014, the NCAA, in partnership with numerous medical and sport organizations, announced “Inter-Association Guidelines” (www.NCAA.org/ssi) that addressed independent medical care in college student-athletes. (Appendix C) The section in teal that follows is taken directly from these guidelines.

BACKGROUND

Diagnosis, management, and return to play determinations for the college student-athlete are the responsibility of the institution’s athletic trainer (working under the supervision of a physician) and the team physician. Even though some have cited a potential tension between health and safety in athletics,^{1,2} collegiate athletics endeavor to conduct programs in a manner designed to address the physical well-being of college student-athletes (i.e., to balance health and performance).^{3,4} In the interest of the health and welfare of collegiate student-athletes, a student-athlete’s health care providers must have clear authority for student-athlete care. The foundational approach for independent medical care is to assume an “athlete-centered care” approach, which is similar to the more general “patient-centered care,” which refers to the delivery of health care services that are focused only on the individual patient’s needs and concerns.⁵ The following 10 guiding principles, listed in the Inter-Association Consensus Statement on Best Practices for Sports Medicine Management for Secondary Schools and Colleges,⁵ are paraphrased below to provide an example of policies that can be adopted that help to assure independent, objective medical care for college student-athletes:

1. The physical and psychosocial welfare of the individual student-athlete should always be the highest priority of the athletic trainer and the team physician.
2. Any program that delivers athletic training services to student-athletes should always have a designated medical director.
3. Sports medicine physicians and athletic trainers should always practice in a manner that integrates the best current research evidence within the preferences and values of each student-athlete.
4. The clinical responsibilities of an athletic trainer should always be performed in a manner that is consistent with the written or verbal instructions of a physician or standing orders and clinical management protocols that have been approved by a program’s designated medical director.
5. Decisions that affect the current or future health status of a student-athlete who has an injury or illness should only be made by a properly credentialed health professional (e.g., a physician or an athletic trainer who has a physician’s authorization to make the decision).
6. In every case that a physician has granted an athletic trainer the discretion to make decisions relating to an individual student-athlete’s injury management or sports participation status, all aspects of the care process and changes in the student-athlete’s disposition should be thoroughly documented.
7. Coaches must not be allowed to impose demands that are inconsistent with guidelines and recommendations established by sports medicine and athletic training professional organizations.
8. An athletic trainer’s role delineation and employment status should be determined through a formal administrative role for a physician who provides medical direction.
9. An athletic trainer’s professional qualifications and performance evaluations must not be primarily judged by administrative personnel who lack health care expertise, particularly in the context of hiring, promotion, and termination decisions.
10. Member institutions should adopt an administrative structure for delivery of integrated sports medicine and athletic training services to minimize the potential for any conflicts of interest that could adversely affect the health and well-being of student-athletes.

Team physician authority becomes the linchpin for independent medical care of student-athletes. Six pre-eminent sports physicians associations agree with respect to “... athletic trainers and other members of the athletic care network report to the team physician on medical issues.”⁶ Consensus aside, a medical-legal authority is a matter of law in 48 states that require athletic trainers to report to a physician in their medical practice. Multiple models exist for collegiate sports medicine. Athletic health care professionals commonly work for the athletics department, student health services, private medical practice, or a combination thereof.

Irrespective of model, the answer for the college student-athlete is established.

EVENT COVERAGE SERVICES

Institutions should have on file an appropriate athletics health care coverage (event) plan that includes equitable access to athletics health care providers for each NCAA sport and student-athlete.

The athletics health care coverage plan should take into consideration the emergency action plans for sport venues, the qualification of coaches to respond to an emergency, and a systemic approach to determine additional athletics health care needs for the venue and sport.

PROVIDERS

The team physician integrates medical expertise with athletic trainers, medical consultants, and other health care professionals. Even if the team physician is not on site at all times, he/she should make regular on-site visits and check in frequently with the athletic training staff. The team physician is ultimately responsible for the clearance to participate and the return-to-play decisions for the institution's student-athletes.

Athletics health care providers (e.g. athletic trainers, team physicians) must be empowered to have the unchallengeable authority to stop any activity that they deem unsafe, and they should determine management and return-to-play of any ill or injured student-athletes without risk of employment status change.

Institutions and athletics health care providers should adhere to federal, state and local regulations; NCAA bylaws and sport playing rules; and the NCAA Sports Medicine Handbook. Athletics health care providers for the student-athlete should be appointed by and should report to institution administrators who are independent from coaches (e.g., health center, campus hospital/medical center, student affairs).

Campus health care facilities are being used more for medical provider oversight while creating a direct link to additional student services. These partnerships are desirable as they help eliminate gaps in medical record information and open care access for general medical conditions and mental health counseling.

An athletics program should feature an adequate number of athletic trainers who are able to provide for the safety and well-being of student-athletes across all

sports. These athletic trainers provide the clinical health care services and sideline care for student-athletes in intercollegiate athletics as part of a physician supervised medical model. Forty-nine states regulate the practice of athletic trainers, and the majority require that an athletic trainer work under the supervision or direction of a physician. All athletic trainers certified by the Board of Certification must provide health care services under the direction of a physician.

The core athletics health care team at many institutions also includes sports psychologist/mental health professionals, strength and conditioning specialists, and sports dietitians. In addition, some institutions include chiropractors, dentists, exercise scientists, facilities personnel, insurance coordinators, massage therapists, nurse practitioners, optometrists, physical therapists and physician assistants as part of their athletics health care team. These individuals must also meet current state and national credentialing requirements for their profession (e.g., licensure, certification, registration). A coach should not have a primary hiring or firing role in determining employment of these additional athletics health care team members.

EVALUATION

An institution should evaluate its health care services on a routine basis. Performance appraisals for health care providers in the athletics setting are an important assessment component for establishing an effective quality improvement program for the sports medicine team. Performance appraisals should include two main areas: (1) individual staff performance and (2) athletics health care services. Athletics health care team members should be evaluated by a person who understands and can evaluate the delivery of quality health care.

An athletics program should use a systematic approach to determine the appropriate level of health care and staffing for student-athlete medical care and sport coverage at an institution. The Appropriate Medical Coverage for Intercollegiate Athletics assessment tool is a rating system using injury rates, the potential for catastrophic injury, and treatment/rehabilitation demands for both time-loss and non-time-loss injuries per sport. Consideration should also include a year-round assessment of squad sizes, travel, traditional and nontraditional season practices and competitions, out-of-season skill instruction sessions, year-round strength and conditioning, and individual health characteristics of team members.



Some examples of day-to-day duties at NCAA institutions include:

Medical Services

- Injury evaluation and treatment
- Injury rehabilitation and reconditioning
- After-hours/on-call consultation and injury/illness management
- Outside medical provider services
- Team physician services
- Concussion pre-injury baseline testing
- Concussion management
- Diagnostic testing
- Exclusive medical provider contracts
- Championships/tournament event coverage
- Injury prevention programs
- Visiting team services
- Ancillary medical services

Risk Minimization

- Injury prevention and care policies
- Environmental monitoring
- Emergency action plans
- Functional movement assessments/assessment of pre-existing conditions
- Mental health counseling referrals
- Nutrition suggestions and referral
- Safe facilities (e.g., BOC Facility Principles)
- Create/maintain appropriate medical referral system
- Review epidemiologic and current evidence-based research for clinical outcomes assessment
- Design and application of preventive and post-injury taping, bracing and padding
- Protective equipment selection, fitting and use

- Recommendations for sport rule changes
- Make appropriate play/no-play decisions
- First aid/CPR training
- Infection control
- Coordinate pre-participation medical examinations
- Practice/event coverage
- Knowledge of and recommendations for institutional and governing body drug testing
- Budget management to provide adequate resources to purchase risk-reduction supplies
- Use communication and interpersonal skills to create trust between student-athletes, coaches, administrators and the athletic training staff

Organization and Administration

- Budgeting
- Electronic medical record management
- Meetings (recruits, parents, coaches and administrators)
- Credential maintenance
- Pre-participation examination (PPE)/medical history
- Sports Medicine Team relations, staff scheduling, performance evaluations
- Emergency action plans (EAPs)
- Hosting physician clinics
- Insurance claims management
- Quality control for facilities and care
- Student-athlete transport to medical appointments
- Drug use prevention
- Inventory management
- Risk management
- Athlete, coach, peer education

Fiscal Management

- Insurance premiums

- Staffing and workload management
- Medical services
- Budget management
- Fundraising
- Academic success
- Contracts

Academics

- Academic teaching/Athletic Training Education Program preceptor
- Life skills presentations
- Psychological issues and referrals
- Counseling referrals/medication documentation (e.g., for attention deficit hyperactivity disorder)
- Student retention through active return-to-play engagement

Of utmost importance is the daily documentation of these services through an adequate medical record-keeping system for any person (including current, prospective and visiting team student-athletes) with whom the athletics health care team is in contact.

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GUIDELINE 1C

MEDICAL EVALUATIONS, IMMUNIZATIONS AND RECORDS

July 1977 • Revised June 2011

Preparticipation medical evaluation. A preparticipation medical evaluation is required by all three NCAA Divisions upon a student-athlete's entrance into the institution's intercollegiate athletics program. The evaluation should be conducted by a medical doctor (MD) or doctor of osteopathic medicine (DO) licensed and in good standing in his or her state. Within this evaluation process, Division I, Division II and Division III require student-athletes new to their campus to confirm their sickle cell solubility status by showing results of a diagnostic test or to sign a written release declining the test. This initial medical evaluation should include a standardized, 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 a change in the student-athlete's health status.

Official and unofficial visit medical evaluations. Institutions should follow regulations pertaining to conducting medical examinations on prospective student-athletes as outlined by their respective division bylaws.

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 recommends cardiovascular screening as a part of the initial 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 taken. Changes in medical status or abnormalities may require more thorough cardiovascular evaluation.

Preparticipation Physical Evaluation (PPE) Monograph. This document guides a practitioner through the PPE process for young athletes from middle school through college. Included are recommendations on PPE timing, setting and structure; medical history questions; and how to determine participation clearance. The manual lists return-to-play guidelines; addresses medicolegal and ethical concerns; and

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)

Acknowledgment That the Injury Is Incapacitating

- Contemporaneous letter or diagnosis from treating physician identifying injury or illness as "incapacitating" OR
- Noncontemporaneous 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 doctor 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)

explores future research and use of electronic formats. The prepared forms are often used as a template or minimum guideline for institutions.

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 main-



tained 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 offseason;
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. 3 and 4) and the 4th Edition Preparticipation Physical Evaluation (see reference No. 6).
5. Immunizations. It is recommended that student-athletes be immunized and up to date for the following:
 - a. Measles, mumps, rubella (MMR);
 - b. Hepatitis B;
 - c. Diphtheria, tetanus (and boosters when appropriate);
 - d. Meningitis; and e. Seasonal influenza (flu).
6. Written permission, signed annually by the student-athlete, which authorizes the release of medi-

cal information to others. Such permission should specify all people 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., seven 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 preg-

nant 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. Acknowledgment 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 or contact the NCAA's student-athlete reinstatement staff.

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GUIDELINE 1D

EMERGENCY CARE AND COVERAGE

October 1977 • Revised July 2012

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. This equipment should include, but is not limited to, an automated external defibrillator (AED), a bag-valve mask, advanced airway tools, a spine board and other stabilization supplies for the head and neck, splints, and bleeding control materials, such as a tourniquet and large sterile dressings. Sports medicine providers should be trained to use emergency equipment prior to deployment. 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 1e);
7. A thorough understanding by all parties, including
 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



the leadership of visiting teams, of the personnel and procedures associated with the emergency-care plan; and

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 nonmedical 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 pileup.
6. Once medical staff members begin 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.

authority to cancel or modify a workout for health and safety reasons (i.e., environmental changes), as he or she deems appropriate.

10. Institutions should ensure that the emergency action plan (EAP) incorporates roles and responsibilities of coaching staff, medical staff, spectators and others during injury evaluation/response on the field, to ensure appropriate first response and medical evaluation. The EAP should provide that appropriate medical staff have access to the injured athlete without interference.
11. 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), bleeding and sickle cell trait (SCT) collapses. All athletics health care providers and coaches, including strength and conditioning coaches, sport coaches and all athletics personnel conducting activities with student-athletes, should review and practice the plan at least annually.

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GUIDELINE 1E

LIGHTNING SAFETY

July 1997 • Revised July 2013, June 2014

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 40 fatalities and about 10 times that many injuries occur from lightning strikes every year. NOAA estimates that as many as 62 percent of lightning strike fatalities occur during outdoor organized sport activities. 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 occurs by being proactive and having a lightning safety plan in place. The following steps are recommended to mitigate the lightning hazard:

1. Develop a lightning safety plan for each outdoor venue. At a minimum, that plan should include the following:
 - a. The use of lightning safety slogans to simplify and summarize essential information and knowledge. For example, the following slogan from the National Lightning Safety Institute is an effective guide: “If you see it, flee it; if you can hear it, clear it.” This slogan reflects the fact that upon the first sound of thunder, lightning is likely within eight to 10 miles and capable of striking your location. No punishment or retribution should be applied to someone who chooses to evacuate if perceiving that his or her life is in danger due to severe weather.
 - b. Designation of a person to monitor threatening weather and to notify the chain of command who can make the decision to remove a team, game personnel, television crews, and spectators from an athletics site or event. That person must have recognized and unchallengeable authority to suspect activity.
 - c. Planned instructions/announcements for participants and spectators, designation of warning and all clear signals, proper signage, and designation of safer places from the lightning hazard.
 - d. Daily monitoring of local weather reports before any practice or event, and a reliable and accurate source of information about severe weather that may form during scheduled intercollegiate athletics events or practices. Of special note should be National Weather Service-issued

DANGEROUS LOCATIONS

Outside locations increase the risk of being struck by lightning when thunderstorms are in the area. Typically, anything referred to as a “shelter” is not safe from lightning. Dugouts, refreshment stands, open press boxes, rain shelters, golf shelters and picnic shelters, even if they are properly grounded for structural safety, are unsafe and may actually increase the risk of lightning injury. Other dangerous locations include high ground, bodies of water (pools, ponds, lakes) and areas connected to, or near, light poles, towers and fences that can carry a nearby strike to people.

- 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. It should be noted that neither watches nor warnings are issued for lightning. An NOAA weather radio is particularly helpful in providing this information.
- e. Identification of, and a mechanism for ensuring access to, the closest safer buildings, vehicles, and locations to the field or playing area, and an estimate of how long it takes to evacuate to that location for all personnel at the event. A safer building or location is defined as:
 - Any fully enclosed building normally occupied or frequently used by people, with plumbing and/or electrical wiring that acts to electrically ground the structure. Avoid using the shower, plumbing facilities, and electrical appliances, and stay away from open windows and doorways during a thunderstorm.
 - 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 frame-

work of the vehicle. Some athletics events rent school buses as safer locations to place around open courses or fields.

2. For large-scale events, continuous monitoring of the weather should occur from the time pre-event activities begin throughout the event.
3. Venue-specific activity-suspension, venue evacuation, and activity-resumption plans:
 - a. Upon the first sound of thunder, lightning is likely within eight to 10 miles and capable of striking your location. Please note that thunder may be hard to hear if there is an athletics event going on, particularly in stadia with large crowds. Lightning can strike from blue sky and in the absence of rain. 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 10 (or more) miles away from the rain shaft. Be aware of local weather patterns and review local weather forecasts prior to an outdoor practice or event.
 - b. Ensure a safe and orderly evacuation from the venue with announcements, signage, safety information in programs, and entrances that can also serve as mass exits. Planning should account for the time it takes to move a team and crowd to their designated safer locations. Individuals should not be allowed to enter the outdoor venue and should be directed to the safer location.
 - c. 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.
 - d. To resume athletics activities, lightning safety experts recommend waiting 30 minutes after both the last sound of thunder and last flash of lightning. A useful slogan is “half an hour since thunder roars, now it’s safe to go outdoors.” 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.

4. Emergency care protocols: 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 strike. Automatic external defibrillators (AEDs) are a 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 and lightning monitoring devices or services are all tools that can be used to aid in the monitoring, notification, and decision-making regarding stoppage of play, evacuation and return to play.

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GUIDELINE 1F

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

CATASTROPHIC INJURY RESEARCH

The National Center for Catastrophic Sports Injury Research continues to research catastrophic injuries in sports through funding by the NCAA. In 2014, Bylaw 3.2.4.18 was approved by the NCAA membership in all divisions and is intended to make tracking catastrophic injuries more accurate and comprehensive. "An active member institution shall submit data detailing student-athlete catastrophic fatalities, near fatalities and catastrophic injuries (e.g., injuries and illnesses related to head, neck, spine, cardiac, pulmonary, heat, sickle cell trait, eyes) to the NCAA on an annual basis pursuant to policies and procedures that govern such data as determined by the Committee on Competitive Safeguards and Medical Aspects of Sports (CSMAS)."

In this effort, the NCCSIR will work the Datalys Center for Sport Injury Research and Prevention, and with the Consortium for Catastrophic Injury Monitoring in Sport to expand the breadth of research to include all major forms of catastrophic injury including head, neck and spine injuries, exertional injuries including heat and sickeling, and cardiac injuries.

Catastrophic injuries include the following:

1. Fatalities;
2. Non-fatalities that result in permanent functional disability;
3. Non-fatal, serious injuries that are recoverable and do not result in permanent disability.

Please report an incident at www.sportinjuryreport.org.

Additional information about the NCCSIR can be found at www.nccsir.unc.edu

Additional information about the Consortium can be found at nccsir.unc.edu/consortia-and-partners/

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 that, 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.

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GUIDELINE 1G

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 people 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, record 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, record 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) places 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 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, record 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.

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GUIDELINE 1H

NONTHERAPEUTIC DRUGS

July 1981 • Revised July 2013, July 2014

The NCAA denounces the use of nontherapeutic drugs such as performance enhancing drugs, alcohol, and other recreational drugs by student-athletes. Examples include, but are not limited to, alcohol, amphetamines, ephedrine, ma huang, opiates, 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. The 2013 NCAA Study of Substance Use Habits of College Student-Athletes, which surveyed 21,086 student-athletes at 1,094 NCAA institutions, showed a continued decline in use of some drugs and an overwhelming majority of athletes who have never used banned substances. The study found that less than 5 percent of respondents had ever used anabolic steroids (0.5 percent), ephedrine (0.5 percent) or amphetamines (4.7 percent) and 97 percent reported having never taken any ergogenic aids while in college. Those responses have remained largely unchanged over the last three iterations of the survey. An overwhelming majority of respondents also reported never using cocaine (98.2 percent) or other narcotics (73.9 percent) within the last 12 months. Social drug use, including alcohol, cigarettes, marijuana and spit tobacco, are all down slightly since 2009.

The NCAA maintains a banned drug classes list (see Appendix A) and conducts drug testing at championship events and year-round random testing in sports. Some NCAA member institutions have developed drug-testing pro-

grams 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 1I. 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 1G.

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.

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STUDENT-ATHLETE DRUG USE

| Patterns of Ergogenic Drug Use* | 2005 | | 2009 | | 2013 | |
|---------------------------------|--------|------|--------|------|--------|------|
| | Female | Male | Female | Male | Female | Male |
| Amphetamines | 3.7 | 4.5 | 3.3 | 4.0 | 3.7 | 5.3 |
| Anabolic Steroids | 0.3 | 1.7 | 0.2 | 0.5 | 0.2 | 0.7 |
| Ephedrine | — | — | 0.9 | 0.9 | 0.4 | 0.5 |
| Patterns of Social Drug Use* | Female | Male | Female | Male | Female | Male |
| Alcohol | 77.3 | 77.6 | 83.1 | 83.1 | 81.6 | 79.8 |
| Cigarettes | 16.3 | 13.4 | 13.5 | 16.8 | 6.3 | 12.7 |
| Cocaine | 1.3 | 2.5 | 1 | 2.3 | 0.7 | 2.6 |
| Marijuana | 17.9 | 23.5 | 18.4 | 25.3 | 16.9 | 24.9 |
| Narcotics | — | — | 3.1 | 3.5 | — | — |
| Spit Tobacco | 1.7 | 25.2 | 2.4 | 27.2 | 1.6 | 24.1 |
| Synthetic Marijuana | — | — | — | — | 0.8 | 2.2 |

* Overall Percentage of Use Within the Past 12 Months

GUIDELINE 11

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. 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 annual drug-education programs:

- Develop a written policy on alcohol, tobacco, marijuana (THC), opiate, and other recreational 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 Resource Exchange Center (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 of if they 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.

Throughout the Year:

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

*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).



GUIDELINE 1J

PRESEASON PREPARATION

July 2013

Athletic performance training is often divided into separate segments: preparation segment, competitive segment and offseason segment. Guideline 1A of this handbook 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.

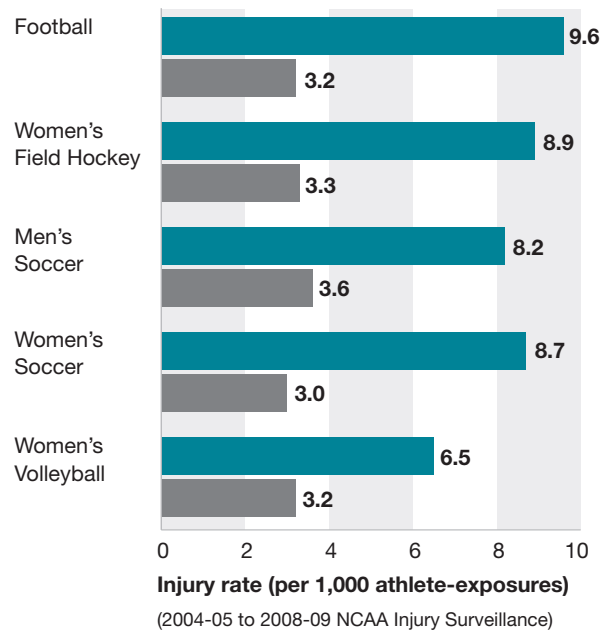
It is commonly accepted that student-athletes should participate in at least six to eight weeks of preseason conditioning. Gradual progression of type, frequency, intensity, recovery and duration of training should be the focus of the preparation segment. In addition to these areas warranted for progression, 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 directly dependent on the level of fatigue driven by volume

Practice injury rates for fall sports



(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.

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.

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.
- Progressively increase workloads and intensity following transitional periods. Conditioning periods should be phased in gradually and progressively to encourage proper exercise acclimatization and to minimize the risk of adverse effects on health. The first seven to 10 days of any new conditioning cycle (including, but not limited to return in January, return after spring break, return in summer, return for fall preseason or return after an injury) are referred to as transitional periods.
- 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 health care 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 automated external defibrillator (AED) use.

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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 (see Guideline 1C).
- (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, a helmet shall be the only piece of protective equipment a student-athlete 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.

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GUIDELINE 1K

STRENGTH AND CONDITIONING PRINCIPLES: FOUNDATIONS FOR ATHLETE DEVELOPMENT

July 2013

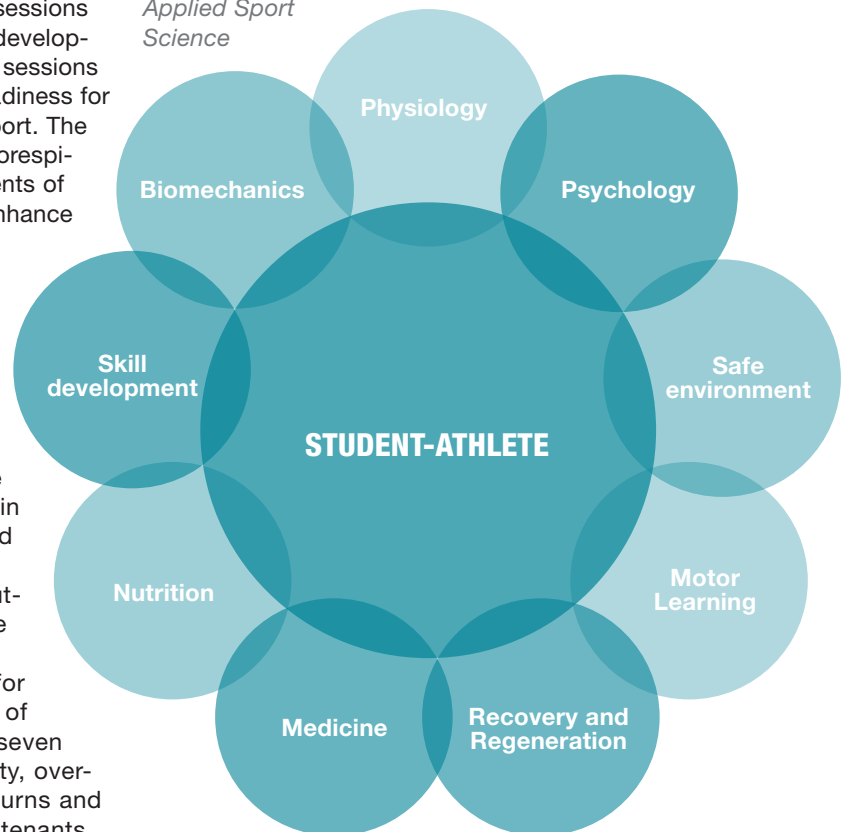
The integration of strength and conditioning sessions has become fundamental to student-athlete development across sports. Appropriately structured sessions can provide student-athletes with optimal readiness for the first practice and the full rigors of their sport. The combination of strength, speed, power, cardiorespiratory fitness and other physiologic components of athletic capacity can complement skill and enhance performance for all athletes.

Sport Performance Team. A multidisciplinary applied sport science approach to athlete performance development provides the best foundation for success as strength and conditioning specialists, athletic trainers, physicians, dietitians, sport coaches, sport psychologists, and exercise physiologists are interconnected and work in concert. This approach creates a sound and effective sport training program based on scientific principles intended to produce outcomes that are sensitive and specific to the sport while accounting for any potential medical limitation and builds a foundation for long-term athlete development. The basics of strength and conditioning are grounded in seven principles of training: individuality, specificity, overload, progression, variation, diminishing returns and reversibility. These principles are the basic tenants of exercise science and are valid in designing any exercise program.

Individuality Principle. Every student-athlete is unique and will respond differently to the same training stimulus. Many factors affect how student-athletes respond to training including their fitness status; current health status and past injuries; genetic predisposition; gender and race; diet and sleep; environmental factors such as heat, cold and humidity; and motivation.

Specificity Principle. All training adaptations are specific to the stimulus applied. The specific physiological adaptations to condition are determined by various factors, including muscle actions involved, speed of movement, range of motion, muscle groups trained, energy systems involved and intensity and volume of training. In an attempt to perfect a specific skill or activity, the athlete must perform that skill or activity with proper body mechanics and correct technique.

Applied Sport Science



Overload Principle. In order for an individual to achieve a certain training adaptation, the body must be stressed by working against a stimulus or load that is greater than that to which it is accustomed. Overload ensures improvement by challenging changes in resistance, terrain, movement complexity and many others. When more is demanded, within reason, the body adapts to the increased demand. Overload can be applied in duration, intensity or both.

Progression Principle. To achieve the desired training adaptations for a certain activity or skill consistently, the training stimulus must gradually and constantly increase. This implies that there is an optimal level and time frame for the overload to occur. Injury may result if overload increases too quickly or an athlete uses poor technique or improper muscle firing patterns. If overload progresses too slowly, improvements will be minimal or nonexistent.

Rest and recovery must also be included in the progression, as consistent training volumes and/or loads can result in fatigue, a decrease in performance and/or injury.

Variation. Variation, or periodization, is the systematic process of altering one or more program variable(s) over time to allow for the training stimulus to remain challenging yet effective. The concept of periodization is to optimize performance and recovery. Because the human body adapts quickly, at least some changes are needed in order for continual progression to occur. It has been shown that systematic variation of volume and intensity over several training cycles is most effective for long-term progression. Variation may take place in many forms and manifests by manipulation of any one or a combination of the acute program variables. However, the two most commonly studied variables have been volume and intensity.

Principle of Diminishing Returns. Performance gains are related to the level of training experience of the individual. Student-athletes new to a conditioning program will experience large initial performance gains. In contrast, student-athletes that have strength trained over several years will make small strength gains over a long period of time. As athletes near their genetic potential, the gains in performance will be much harder to obtain. The principle of diminishing returns highlights the importance of being able to interpret performance results and understanding the individual student-athlete.

Reversibility/Regression. When the training stimulus is removed or reduced, the ability of the student-athlete to maintain performance at a particular level is also reduced, and eventually the gains that were made from the training program will revert back to their original level. Also known as detraining, the decrease in performance is directly related to the inactivity of the muscles that have been atrophied from nonuse.

When designing strength and conditioning programs, it is important to have a clear understanding of the basic training principles. Understanding these principles will help the student-athlete, sport coach and strength and conditioning coach set realistic goals and develop training programs that will provide the greatest opportunity to achieve performance gains. Student-athletes often have time constraints and are under pressure to be at their peak level of performance. It is the responsibility of the strength and conditioning coach to thoroughly evaluate the level of conditioning of all new and returning athletes and to properly prescribe the appro-

COMMON TERMS

Bioenergetics: the flow of energy in a biological system; the source of energy for muscular contractions.

Energy: the capacity to perform work.

Frequency: the number of training sessions expressed per day, per week, per month.

Intensity: the difficulty of the work. Intensity is the amount of weight or resistance used in a particular exercise.

Muscular Strength: the ability of the muscles to generate force.

Periodization: the systematic process of altering one or more program variable(s) over time to allow for the training stimulus to remain challenging and effective.

Progression: the selection of exercises, loads or resistances, order of exercises, and readiness of the athlete that are conducive to the athlete's training status and the demands of the activity. Progression in resistance training may be defined as the act of moving forward or advancing toward a specific goal over time until the target goal has been achieved.

Progressive Overload: the gradual increase of stress placed upon the body during exercise training.

Training: the process of preparing an athlete physically, technically, tactically, psychologically for the highest levels of performance.

Volume: the total amount of work performed. Sets and repetitions of an exercise combine to make volume. Training volume is a summation of the total number of repetitions performed during a training session multiplied by the resistance used (kg) and is reflective of the duration of which muscles are being stressed.

Volume-Load: the combination of volume and intensity. Volume-load is calculated as sets x repetitions x weight, or resistance used.



appropriate training volume, load and intensity to protect the health and safety of each student-athlete.

The safest approach after a break is to provide flexibility within the strength and conditioning program. Extended periods of time away from training reduce aerobic and anaerobic thresholds. Not only are incoming athletes at risk of injury, but returning, “de-trained” athletes can be at risk of injury and exertional collapse. Flexibility within the strength and conditioning program allows for adaptations to be made based on the returning athletes' present physiological status.

Sports-Specific Performance Enhancement. As defined in the principle of specificity, training needs to be relevant to the individual needs of the activity or sport. Although there is some carryover of training effects to other general fitness and performance attributes, the most effective strength and conditioning programs are those that are designed to target-specific training goals.

Trainable characteristics include muscular strength, power, hypertrophy and local muscular endurance. Performance attributes such as speed and agility, balance, coordination, jumping ability, flexibility, core strength and other measures of motor performance are enhanced by resistance training.

Injury Prevention. After the student-athlete completes the preparticipation examination, strength and conditioning coaches should be made aware of health-related issues that could affect training (e.g. sickle cell trait status, asthma and cardiac conditions, acute illness, lack of sleep, suboptimal nutrition, as well as any relevant medications being taken).

The use of the periodization concept and creating an annual plan have proven vital to the optimization of training adaptations in athletes. One of the primary advantages of this training approach is to avoid overtraining. Thus, built within the annual plan is time needed for physical and mental recovery. Many overtraining syndromes are a function of the rate of progression – attempting to do too much too soon, before the body’s physiological adaptations can cope with the stress. This typically results in extreme soreness, injury and in rare cases death.

Like all athletic activities, injury is a possibility and preparation for conditioning sessions should be designed to reduce the likelihood of injury. The goal of physical conditioning is to optimize the performance of the athlete and minimize the risk of injury and illness. A well-designed strength and conditioning program along with appropriate, sport-specific skill development are the best approaches to preventing injury. Strength training protects the joints from trauma while sport-specific skill training can help prevent injury by improving the athlete’s proprioception. By increasing the strength of the muscles that surround the hips, knees, ankles, shoulders and elbows before the season starts, athletes will be less likely to suffer muscle strains and joint sprains. Athletes returning to athletic activity from a detrained state are at the greatest risk of injury.

The first step to safe performance is thorough and competent training of strength and conditioning coaches. Strength and conditioning professionals apply scientific knowledge to train athletes for the primary goal of improving athletic performance. They conduct sport-specific testing sessions, design and implement safe and effective strength training and

conditioning programs, monitor facilities for safety, and convey principles of nutrition and injury prevention as a member of the performance team. Recognizing that their area of expertise is separate and distinct, strength and conditioning coaches can consult with and refer student-athletes to other athletics health care professionals when appropriate. Strength and conditioning coaches should be certified by a nationally accredited organization. The required components for certification of strength and conditioning personnel vary across national certifying agencies, and individual states lack professional practice regulation similar to medical professionals. Therefore, institutions should identify a particular agency or agencies that meet their institution's expectations for developing and conducting appropriate workouts for intercollegiate student-athletes. When considering components for appropriate strength and conditioning certifications, institutions should note whether the certifying agency:

1. Is accredited by an oversight organization (e.g., National Commission for Certifying Agencies-accredited);
2. Requires an undergraduate college degree;
3. Requires a continuing education component; and
4. Requires current first aid, CPR and AED use certification.

Preventing Sudden Death. Recent evidence has identified several important complications to student-athlete health of which everyone in athletics should be aware. These include sudden cardiac death, asthma, concussion, exertional rhabdomyolysis, heat illness and an increased risk of exertional collapse in athletes with sickle cell trait. The Inter-Association Task Force for Preventing Sudden Death in Collegiate Conditioning Sessions published the following 10 recommendations for preventing sudden death in collegiate conditioning sessions:

1. Acclimatize progressively for utmost safety.
2. Introduce new conditioning activities gradually.
3. Do not use exercise and conditioning activities as punishment.
4. Ensure proper education, experience and credentialing of strength training and conditioning coaches.

SUMMER CONDITIONING PERIOD POINTS OF EMPHASIS

1. Institutions should review the guidelines in the NCAA Sports Medicine Handbook (e.g. hydration, emergency care and coverage, medical evaluations, etc.) in developing and updating their policies.
2. Institutions should implement an appropriate rest and recovery plan that includes a hydration strategy.
3. Coaches are encouraged to consult with medical staff in the development of the conditioning sessions. All personnel should be aware of the potential impact acclimatization, hydration, medications and drugs, existing medical conditions, nutritional supplements, and clothing/equipment have on student-athletes' health while participating in strenuous workouts.
4. All on-field personnel should review, practice and follow their venue emergency plan and be trained in administering first aid and cardiopulmonary resuscitation (CPR).
5. Before summer participation, student-athletes should be oriented to the logistics of the summer period and any health and safety concerns that may be associated with participating in strenuous workouts.
6. Incoming freshman/transfers should ideally work out separate from the varsity; or, at the very least be provided a closely monitored, lower-intensity conditioning program to allow gradual physiological adaptation to occur.
7. Student-athletes should be encouraged to report illnesses, injuries and the use of medications and nutritional supplements.
8. Discourage athletes from using caffeine and/or other stimulants that mask fatigue.
9. Monitor athletes closely for the emergence of overtraining signs and symptoms such as unusual fatigue and/or muscle soreness, musculoskeletal injuries and rhabdomyolysis; and promptly refer for immediate medical evaluation with obvious indications of muscle breakdown, such as dark brown urine or severe muscle pain.

5. Provide appropriate medical coverage.
6. Develop and practice, at least annually, the institution's emergency action plan.
7. Be cognizant of medical conditions.
8. Properly design and administer strength and conditioning programs.
9. Partner with recognized professional organizations.
10. Provide adequate continuing education for the entire coaching and medical teams.

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2 MEDICAL ISSUES



GUIDELINE 2A

MEDICAL DISQUALIFICATION

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, communicable disease) 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.

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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, can impair performance and may be life threatening. A person may exhibit cold stress due to environmental or nonenvironmental 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 nonenvironmental 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 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 and 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 of extremities, 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. Permanent numbness, chronic pain, cold sensitivity, sensory loss and a variety of other symptoms may last for years.

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 nonfreezing 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 who are 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. For example, polypropylene and wool can wick moisture away from the skin and retain insulating properties when wet. Add light-weight 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 face mask 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-18 degrees Fahrenheit. Cooling is accelerated with wet clothing. Frostbite can occur within 30 minutes or faster if clothing is wet, it is windy, or wind is produced during sport movement.

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 dan-



WIND CHILL CHART



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

Available at: www.weather.gov/

gerous wind chill conditions is about minus-18 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.

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GUIDELINE 2C

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 heatstroke (EHS) is the third-leading cause of on-the-field sudden death in athletes. There have been more deaths from heatstroke in the recent five-year block from 2005 to 2009 than any other five-year block in the previous 30 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 shinguards, 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

PROTECT YOURSELF AND YOUR TEAMMATES

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.

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.



gear and clothing and to practice in moisture-wicking 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). The American College of Sports Medicine publishes 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, 20 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 no more than 6-8 percent carbohydrates and electrolytes to enhance fluid consumption. In addition,
 7. During the preseason period or periods of high environmental stress, the student-athletes' weight should be recorded before and after every workout, practice and competition. This procedure can detect progressive dehydration and loss of body fluids. Those who lose 5 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.
 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 heatstroke 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.



the carbohydrates provide energy and help maintain immune and cognitive function.

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 effects similar to those of some nutritional supplements. These substances may be ingested through over-the-counter or prescription medications, recreational drugs, or food. Examples include antihistamines, decongestants, certain asthma medications, Ritalin, diuretics and alcohol.
- 7. Medical conditions.** Examples include illness with fever, gastrointestinal 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/SSI.*

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 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).

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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 ounces two to three hours before exercise).
- Drink early (8 ounces every 15 minutes during exercise).
- Replace fluids (20 ounces 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.

GUIDELINE 2D

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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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 him or her 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.

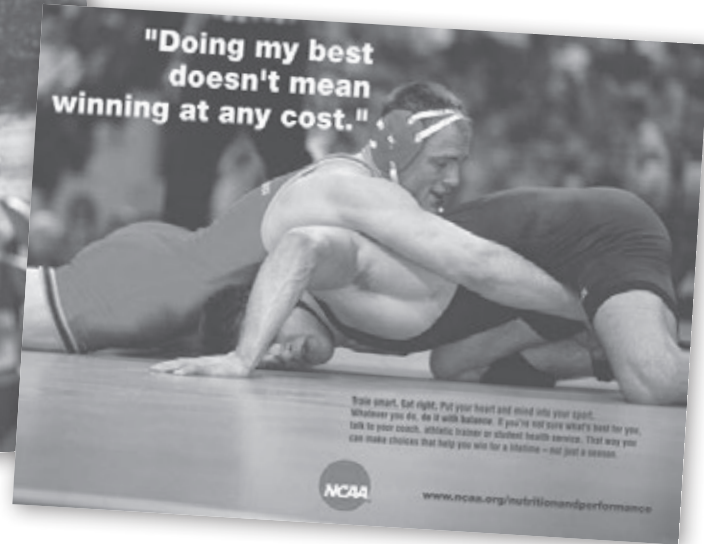
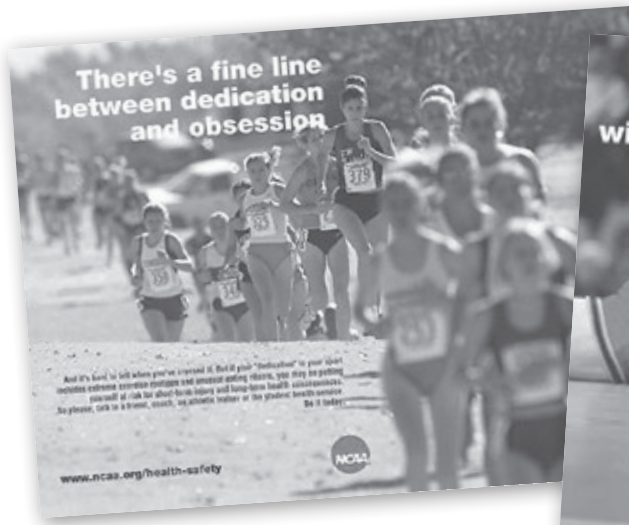
Besides the aesthetic and performance reasons for wanting to achieve an optimal body composition, there may also be safety reasons. A student-athlete who is carrying excess weight may be more prone to injury when performing difficult skills than the student-athlete with a more optimal body composition. 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 result 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, skin-fold 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 interaction. 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 noninvasiveness 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 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.

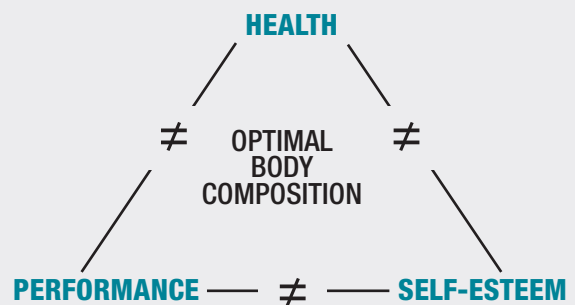
Student-athletes who have frequent weight and/or skinfolds taken are fearful of the outcome, since the results are often (inappropriately) used punitively. Real changes in body composition occur slowly, so there is little need to assess student-athletes weekly, biweekly or even monthly. If body composition 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 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.

UNDERSTANDING OPTIMAL 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 a sign that health is being challenged.



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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GUIDELINE 2F

NUTRITION AND ATHLETIC PERFORMANCE

January 1986 • Revised June 2002, May 2009, 2013

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 Academy of Nutrition and Dietetics.

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

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

Carbohydrates, the primary fuel for higher intensity activity, are required to replenish liver and muscle

glycogen stores and to prevent low blood sugar (hypoglycemia) during training. Carbohydrate intake 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 6 to 10 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 carbohydrates 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 carbohydrates, to replace glycogen stores, can be calculated based on 1 to 1.5 grams of carbohydrates per kilogram of body weight and should be consumed immediately after training sessions. Within two hours after training, additional carbohydrates 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 carbohydrates, as these contain essential micronutrients vital to health and performance. Whole grain breads and pasta, whole fruits and vegetables are excellent sources of high-quality carbohydrates.

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). Recommendations include ingesting a snack rich in carbohydrates with 10-20 grams of protein within 30 minutes after a training session for effectiveness.

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 immune function. During prolonged, lower-intensity training, fats are a major energy contributor and are stored in muscle as triglyceride for use during activity. Dietary fat intake is suggested to be from 20 to 35 percent of total daily caloric intake.



NCAA.org/SSI

Fact sheets from the Sport Science Institute available online at NCAA.org/SSI



I am a junior student-athlete. I have morning workouts at 5:30 a.m., and my first class is at 8:30 a.m. I am too busy to eat breakfast and I stop at the cafeteria for lunch between classes. I am back in the pool at 3:30 for a two-hour practice, then I have to grab dinner before going to study hall from 7 to 9 p.m. Sometimes I have to study late into the evening to finish a paper or prep for an exam. How can I sustain my energy throughout the day to optimize both my academic and athletic performance?

- EAT OFF RIGHT:** Breakfast is the most important meal of the day; choose nutrient-rich foods.
- PLAN AHEAD:** Have portable performance foods in your backpack for fuel every two to three hours between meals and around training.
- ADAPT TO YOUR NEEDS:** Know what foods to eat with your body. Don't try new foods or meals during days that you have important training sessions or a competition.

(For food options and tips, turn the page.)



Diets low in fat 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. 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 Recommended Dietary Allowances) are not recommended.

Hydration status affects 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 rehydration for exercise lasting longer than 60 minutes. Fluids (e.g., energy drinks) containing questionable supplement ingredients and high levels of caffeine or other stimulants (e.g. 500 milligrams) may be detrimental to the health of the competitive athlete and are not effective forms of fuel or hydration.

Adequate overall energy intake throughout 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 intake increases fatigue, depletes muscle glycogen stores, increases the risk of dehydration, decreases immune function, increases the risk of injury and can 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 balanced.

The use of extreme weight-control measures can jeopardize the health of the student-athlete and possibly trigger behaviors associated with disordered eating. 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 interdisciplinary medical care (medical, psychological, sports dietetics).

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 disordered eating is much more prevalent in women (approximately 90 percent of the reports in NCAA studies were in women's sports), disordered 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 for health reasons. The medical examination and updated health 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.

Disordered eating is often an expression of underlying emotional distress that may have developed long before the individual was involved in athletics. Disordered eating can be triggered in psychologically vulnerable individuals by a single event or comments (such as offhand remarks about appearance, or constant badgering about a student-athlete's body weight, body composition or body type) from a person important to the individual. Coaches, athletic trainers, sport dietitians and supervising physicians must be watchful for student-athletes at higher risk for eating disorders. Disordered eating can lead to dehydration, 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.

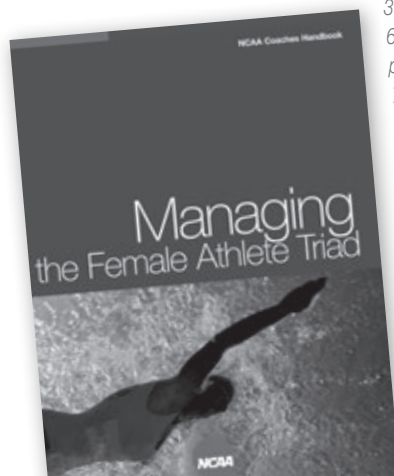
Body composition and body weight can affect exercise performance but should not be used as the main criteria for participation in sports. Decisions regarding weight loss should be based on the following recommendations to reduce the risk of disordered eating:

1. Frequent weigh-ins (either as a team or individually) are discouraged unless part of strategies to determine sweat loss as 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, sports dietitian and medical staff with consultation from the coach.
4. Weight-loss plans should be individualized, realistic and preferably designed by a board certified specialist in sports dietetics (CSSD).

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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Available online at
NCAA.org/SSI.

GUIDELINE 2G

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. Most compounds obtained from specialty “nutrition” stores and mail-order businesses are not 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 grams per kilogram of 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 carbohydrates 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 carbohydrates 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.)

RESOURCE EXCHANGE CENTER

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.

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 grams per kilogram of body weight) for all types of student-athletes. Athlete should consider eating a post-workout carbohydrate snack that contains protein within one hour of concluding that vigorous exercise session. 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 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 megadoses 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 main source of energy for the muscle during exercise will come from carbohydrate rich foods. 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 diar-

rhea, 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 1 to 3 kilograms per week have been found in creatine users, but the cause is unclear.

Many other “high-tech” nutritional 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 (e.g. 500 milligrams) 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

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!

NCAA www.NCAA.org/health-safety

THE DANGER OF SUPPLEMENTS

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.

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.

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GUIDELINE 2H

'BURNERS' (BRACHIAL PLEXUS INJURIES)

June 1994 • Revised June 2003

"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.

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.

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, although foramen encroachment may also be a cause of symptoms. 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 preservation of the epineuri-

um, 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 an MRI should be done to rule out cervical disk or other compressive pathology. If symptoms persist for more than two to three 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 will not show positive findings until at least two weeks after the nerve injury and those nerve 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 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 Guideline 1C) so that these "at-risk" athletes can be instructed in a 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. However, at-risk student-athletes are those who have: 1) narrow cervical foramen or 2) poor neck and shoulder muscular stabilization. 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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GUIDELINE 21

SPORT-RELATED CONCUSSION

June 1994 • Revised July 2004, 2009, July 2010, July 2011, July 2013, July 2014

In July 2014, the NCAA, in partnership with numerous medical and sport organizations, announced “Inter-Association Guidelines” (www.NCAA.org/ssi) that addressed diagnosis and management of sport-related concussion. The section in teal that follows is taken directly from these guidelines.

BACKGROUND

There are more than 42 consensus-based definitions of concussion. A recently published, evidence-based definition of concussion follows.¹

Concussion is:

- a change in brain function,
- following a force to the head, which
- may be accompanied by temporary loss of consciousness, but is
- identified in awake individuals, with
- measures of neurologic and cognitive dysfunction.

Diagnosis and management of sport-related concussion is a clinical diagnosis based on the judgment of the student-athlete’s health care providers.² The diagnosis and management of sport-related concussion is challenging for many reasons:

- The physical and cognitive examinations are often normal, and additional tests such as brain computerized tomography (CT), brain MRI, electroencephalogram and blood tests are also commonly normal. Although comprehensive neuropsychological tests may be a useful adjunctive tool supporting the diagnosis of sport-related concussion, there remains controversy regarding interpretation and utility as a clinical tool.
- The clinical effects of sport-related concussion are often subtle and difficult to detect with existing sport-related concussion assessment tools.
- The symptoms of sport-related concussion are not specific to concussion and it is challenging to evaluate a student-athlete who presents non-specific symptoms that may be related to other conditions.
- Sport-related concussion may manifest with immediate or delayed-onset symptoms. Symptom manifestation can vary between individuals and in the same individual who has suffered a repeat concussion.

- Modifying factors and co-morbidities -- such as attention deficit hyperactivity disorder, migraine and other headache disorders, learning disabilities and mood disorders -- should be considered in making the diagnosis, in providing a management plan, and in making both return-to-play and return-to-learn recommendations.³⁻⁷

- “Signal detection” on clinical measures (e.g., cognitive and balance testing) often quickly diminishes in the acute setting of early recovery. Although cognitive function and balance assessed within 24 hours with various sideline tests (Standardized Assessment of Concussion [SAC] and Balance Error Scoring System, respectively) have been shown to be useful in diagnosing concussion, these tests often normalize within a few days and cannot be used to make a definitive diagnosis.

- Student-athletes may underreport symptoms and inflate their level of recovery in hopes of being rapidly cleared for return to competition.^{8,9}

- Clinical assessment of sport-related concussion is a surrogate index of recovery and not a direct measure of brain structure and functional integrity after concussion.

In summary, the natural history of concussion remains poorly defined, diagnosis can be difficult, there are often few objective findings for diagnosis or physiological recovery that exist for clinical use, and there often remains a significant reliance on self-report of symptoms from the student-athlete.

The NCAA Concussion Policy and Legislation mandates that institutions implement the following:¹⁰

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

dent-athlete diagnosed with a concussion to return to athletics activity as determined by a physician or the physician’s designee.

GUIDELINES

The goals of developing guidelines for the diagnosis and management of sport-related concussion are: (1) helping athletic health care providers to diagnose and manage sport-related concussion; (2) developing prevention strategies for sport-related concussions and repeat sport-related concussion; (3) promoting sport-related concussion injury resolution; (4) minimizing factors that contribute to prolonged or recurrent symptoms of sport-related concussion; and (5) preventing or minimizing complications of other co-morbidities that may accompany sport-related concussion (e.g., ADHD, migraine and other headache disorders, learning disabilities and mood disorders).

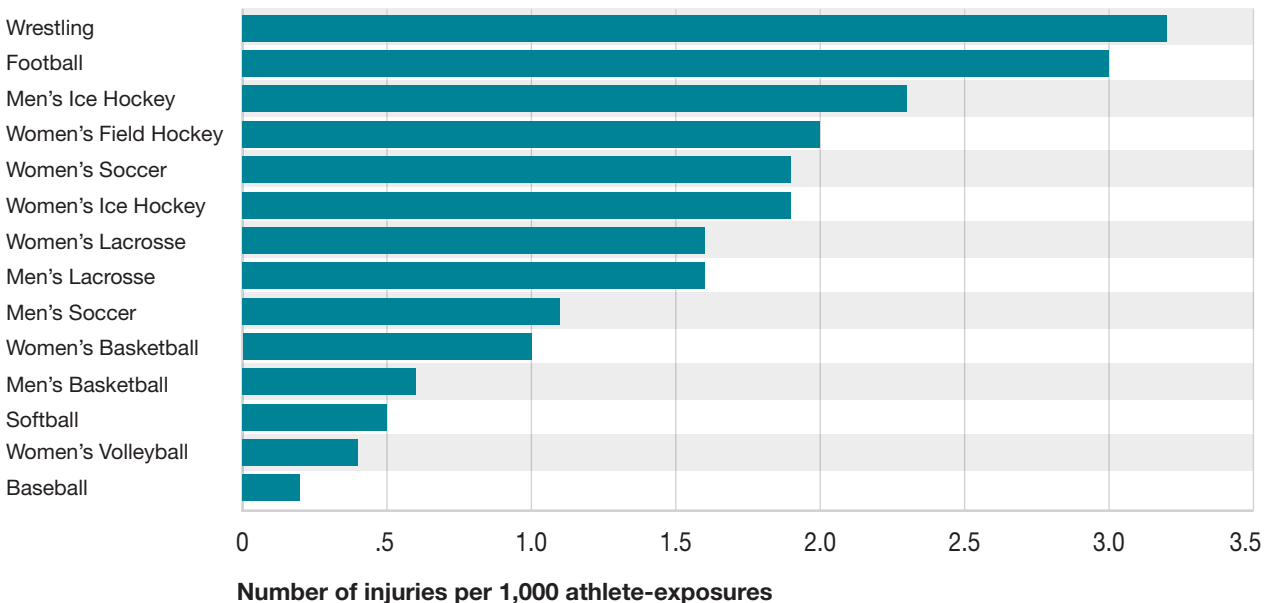
CONCUSSION MANAGEMENT PLAN

Institutions should make their concussion management plan publically available, either through printed material, their website, or both. Guideline components of a concussion management plan are:

1. Education: Institutions should provide applicable NCAA concussion fact sheets or other applicable educational material annually to student-athletes,



Figure 1: Rate of competition concussion injury in 14 NCAA sports



Data from 2004-05 to 2013-14. Overall practice and game injury rates for each sport can be found in

coaches, team physicians, athletic trainers, and athletics directors. There should be a signed acknowledgement that all parties have read and understand these concussion facts and their institution's concussion management plan.

2. Pre-participation assessment: A one-time, pre-participation baseline concussion assessment for all varsity student-athletes should include, but not necessarily be limited to:

- A brain injury/concussion history;
- Symptom evaluation;
- Cognitive assessment; and
- Balance evaluation.

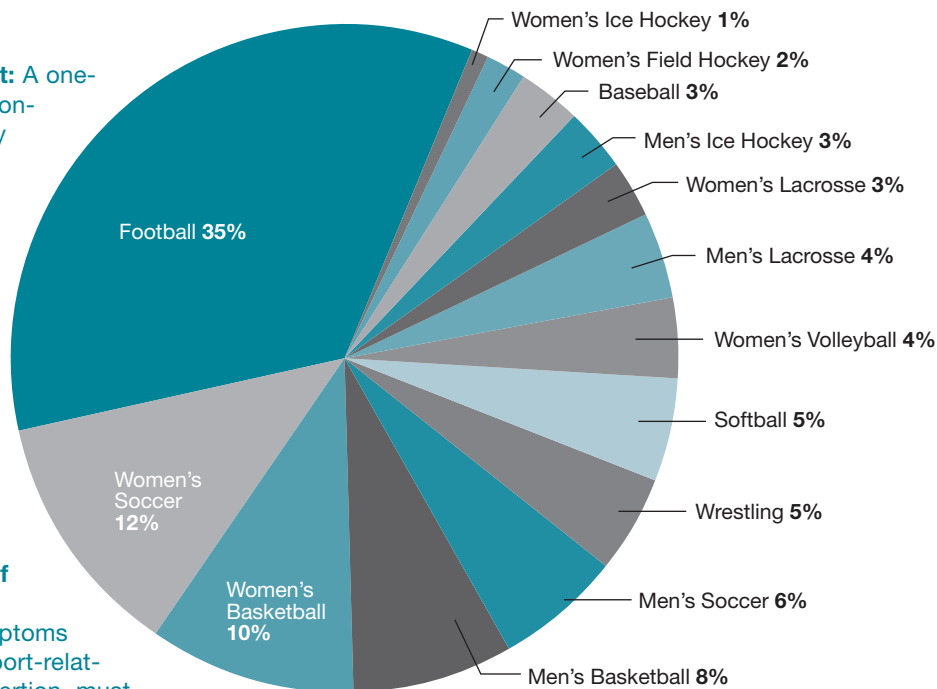
The team physician should determine pre-participation clearance and/or the need for additional consultation or testing.¹¹

3. Recognition and diagnosis of concussion:

All student-athletes who are experiencing signs, symptoms or behaviors consistent with a sport-related concussion, at rest or with exertion, must be removed from practice or competition and referred to an athletic trainer or team physician with experience in concussion management. A student-athlete's health care provider experienced in the diagnosis and management of concussion should conduct and document serial clinical evaluation inclusive of symptom inventory and evaluation of cognition and balance. A student-athlete diagnosed with sport-related concussion should not be allowed to return to play in the current game or practice and should be withheld from athletic activity for the remainder of the day. Disposition decisions for more serious injuries such as cervical spine trauma, skull fracture or intracranial bleed, should be made at the time of presentation.

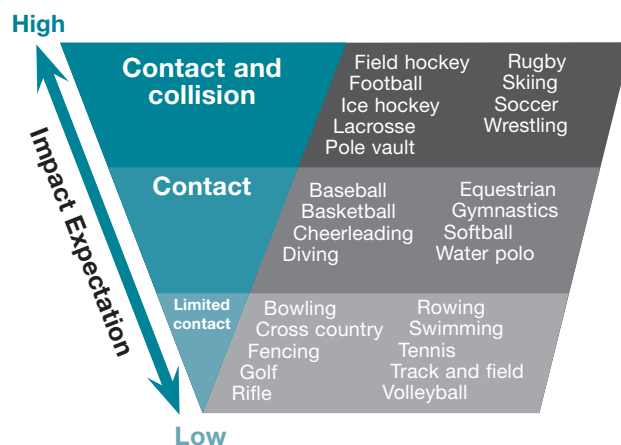
4. Post-concussion management: The foundation of sport-related concussion management is initial physical and relative cognitive rest as part of an individualized treatment plan.² Initial management of sport-related concussion is based on individual serial clinical assessments, taking a concussion history, modifying factors, and taking specific needs of the student-athlete into consideration. Such management includes, but is not limited to:

Figure 2: National annual estimate of concussions for practice and competition in 14 NCAA sports



Data from 2009-14.

Figure 3: Impact expectation by sport



- Clinical evaluation at the time of injury. When the rapid assessment of concussion is necessary (e.g., during competition), symptom assessment, physical and neurological exam, and balance

SIGNS AND SYMPTOMS OF CONCUSSION

Physical

- Headache
- Nausea
- Vomiting
- Balance problems
- Fatigue
- Sensitivity to light
- Numbness/tingling
- Dazed
- Stunned

Cognitive

- Feeling mentally “foggy”
- Feeling slowed down
- Difficulty concentrating
- Difficulty remembering
- Forgetful of recent information and conversations
- Confused about recent events
- Answers questions slowly

Emotional

- Irritable
- Sad
- More emotional
- Nervous

Sleep

- Drowsiness
- Sleeping more than usual
- Sleeping less than usual
- Difficulty falling asleep

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exam should be performed. Brief concussion-evaluation tools such as the Standardized Concussion Assessment Tool 3 (SCAT3), which includes the Standardized Assessment of Concussion (SAC), provide standardized methods and can be compared to a baseline evaluation.¹²

- Assessment for head and cervical spine injury at time of injury and implementation of the emergency action plan, as warranted.
- Transportation to the nearest hospital if any of following signs and symptoms are present: Glasgow Coma score less than 13; prolonged period of loss of consciousness (longer than one minute); focal neurological deficit; repetitive vomiting; persistently diminished or worsening mental status or other neurological signs or symptoms; and potential spine injury.
- Serial evaluation and monitoring for deterioration following injury. Upon discharge from medical care, both oral and written instructions for home care should be given to the student-athlete and to a responsible adult (e.g., parent or roommate) who should continue to monitor and supervise the student-athlete during the acute phase of sport-related concussion.¹²

RETURN TO ACTIVITY

Sport-related concussion is a challenging injury for student-athletes and, unlike other injuries, the timeline for return to full activity (including return-to-play and return-to-learn) is often difficult to project. The psychological response to injury is also unpredictable. Sometimes, student-athletes who are kept out of their sport for a prolonged period of time experience emotional distress related to being unable to participate in sport.¹³ It is important that health care providers remain alert to the

signs and symptoms of depression and other emotional responses to injury that can be particularly challenging following concussive injury.¹³ A student-athlete's health care providers should verify the diagnosis instead of assuming that the student-athlete has prolonged concussion symptoms. These symptoms may represent post-concussion syndrome, sleep dysfunction, migraine or other headache disorders, or co-morbid mood disorders such as anxiety and depression.⁷ Passive management, such as prolonged physical and cognitive rest, may be counter-productive in these scenarios.

RETURN-TO-PLAY

Once a student-athlete has returned to his/her baseline, the return-to-play decision is based on a protocol of a stepwise increase in physical activity that includes both an incremental increase in physical demands and contact risk supervised by a physician or physician-designee.¹² Most return-to-play protocols are similar to those in the Consensus Statement on Concussion in Sport guidelines,² which outline a progressive increase in physical activity if the individual is at baseline before starting the protocol and remains at baseline throughout each step of the protocol. It is noteworthy that all return-to-play guidelines are consensus-based and have not been validated by evidence-based studies.¹⁴⁻¹⁵ McCrea and colleagues¹⁶ have reported that a symptom-free waiting period is not predictive of either clinical recovery or risk of a repeat concussion. Further, student-athletes have variable understanding of the importance of reporting possible concussion symptoms.⁸⁻⁹ In summary, it should be recognized that current return-to-play guidelines are based on expert consensus.

There is emerging evidence that focused exercise or recovery techniques may be utilized before full recovery

has occurred, but more study is needed. Given the paucity of scientific evidence regarding return-to-play and expert consensus documents that have been published, adherence to consensus guidelines is recommended. However, it is important to stress an individualized approach for return-to-play. Some student-athletes may have minimal concussive symptomatology with minimal symptom duration and no modifiers (conditions that may prolong recovery such as prior concussion, migraine, ADHD, depression/anxiety). In scenarios of this nature, and with experienced clinicians in a highly select setting, the return-to-play protocol may be modified.¹⁷ In contrast, if a student-athlete has a concussion history, increased symptom burden or duration, or has symptoms for three to four weeks with other concussion modifiers, then the return-to-play progression should proceed more cautiously and each stage may take more than a day.¹²

Distinctive neurological deficits, such as vestibular or oculo-motor dysfunction, should be specifically addressed to avoid prolonged return-to-play. For example, if a student-athlete suffers from vestibular dysfunction as a manifestation of sport-related concussion, and is unable to progress in the return-to-play protocol, it is important to address the specific vestibular dysfunction rather than to simply return the student-athlete to the previous level of return-to-play progression.⁷ In other words, 'rest' can sometimes lead to adverse outcomes if an accurate diagnosis based on neurological dysfunction is not made. The guidelines presented herein serve as a general guide and are not meant to be prescriptive.

STEPWISE PROGRESSION

The initial management of sport-related concussion is relative physical and cognitive rest. Athletes diagnosed with sport-related concussion must be removed from play and must not return to sport-related activity for at least one calendar day and are to be evaluated by a health care provider with expertise in sport-related concussion. Once a concussed student-athlete has returned to baseline level of symptoms, cognitive function and balance, then the return-to-play progression can be initiated, as follows in this general outline:

1. Light aerobic exercise such as walking, swimming or riding a stationary bike. No resistance training. If asymptomatic with light aerobic exercise, then;
2. Mode, duration and intensity-dependent exercise based upon sport. If asymptomatic with such exertion, then;
3. Sport-specific activity with no head impact. If asymptomatic with sport-specific activity, then;

4. Non-contact sport drills and resumption of progressive resistance training. If asymptomatic with non-contact drills and resistance training, then;
5. Full-contact practice. If asymptomatic with full-contact practice, then;
6. Return-to-play. Medical clearance will be determined by the team physician/physician designee, or athletic trainer in consultation with a team physician.

At any point, if the student-athlete becomes symptomatic (i.e., more symptomatic than baseline), or scores on clinical/cognitive measures decline, the team physician should be notified and the student-athlete should be returned to the previous level of activity. Final determination of return-to-play ultimately resides with the team physician/physician designee.

RETURN TO ACADEMICS

Return to academics (return-to-learn) is a parallel concept to return-to-play,^{6,18-20} but has received less scientific evaluation. Return-to-learn guidelines assume that both physical and cognitive activities require brain energy utilization, and that after a sport-related concussion, brain energy may not be available for physical and cognitive exertion because of a brain energy crisis.³ Return-to-learn should be managed in a stepwise program that fits the needs of the individual, within the context of a multi-disciplinary team that includes physicians, athletic trainers, coaches, psychologists/counselors, neuropsychologists, administrators as well as academic (e.g. professors, deans, academic advisors) and office of disability services representatives. The return-to-learn recommendations outlined below are based on expert consensus. Like return-to-play, it is difficult to provide prescriptive recommendations for return-to-learn. The student-athlete may appear physically normal but may be unable to perform as expected due to concussive symptomatology.

STEPWISE PROGRESSION

As with return-to-play, the first step of return-to-learn is relative physical and cognitive rest. Relative cognitive rest involves minimizing potential cognitive stressors, such as school work, video games, reading, texting and watching television. Data from small studies suggest a beneficial effect of cognitive rest on concussion recovery.²⁰ For the college student-athlete, consideration should be given to avoiding the classroom for at least the same day as the sport-related concussion. The period of time needed to avoid class or homework should be individualized. The gradual return to academics should be based on the absence

STEPWISE RETURN-TO-PLAY PROTOCOL

1. Light aerobic exercise (Walking, swimming or stationary cycling; no resistance training.)

2. Mode, duration and intensity-dependent exercise based upon sport

3. Sport-specific activity with no head impact

4. Non-contact sport drills and resumption of progressive resistance training

5. Full-contact practice

6. Return to play

of concussion symptoms following cognitive exposure. The consensus to date includes:^{3,19}

1. If the student-athlete cannot tolerate light cognitive activity, he or she should remain at home or in the residence hall.
2. Once the student-athlete can tolerate cognitive activity without return of symptoms, he/she should return to the classroom, often in graduated increments.

At any point, if the student-athlete becomes symptomatic (i.e., more symptomatic than baseline), or scores on clinical/cognitive measures decline, the team physician should be notified and the student-athlete's cognitive activity reassessed.

The extent of academic adjustments needed should be decided by a multi-disciplinary team that may include the team physician, athletic trainer, faculty athletics representative or other faculty representative, coach, individual teachers, neuropsychologist and psychologist/counselor. The level of multi-disciplinary involvement will vary on a case-by-case basis. The majority of student-athletes who are concussed will not need a detailed return-to-learn program because full recovery typically occurs within two weeks. For the student-athlete whose academic schedule requires some minor modification in the first one to two weeks following a sport-related concussion, adjustments can often be made without requiring meaningful curriculum or testing alterations.

For those student-athletes whose symptoms persist for longer than two weeks, there are differing ways to access academic adjustment or accommodations. The student-athlete may need a change in his or her class schedule; special arrangements may be required for extended absences, tests, term papers and projects.

Many institutions offer “provisional or temporary” accommodations for individuals who have impairments that are short-term in nature – six months or less (such as a broken arm or concussion). Such accommodations are often accessed through the disability services office.

A more difficult scenario occurs when the student-athlete experiences prolonged cognitive difficulties. In this case, considerations should include neuropsychological evaluation to: (a) determine the nature and severity of cognitive impairment, and (b) identify the extent to which psychological issues may be present and may be interacting with the cognitive processes. Institutions can develop a detailed academic plan that specifies the support services available for that student-athlete. The student-athlete can also choose to disclose the documentation to the disability office in order to seek long-term accommodations or academic adjustments. The disability office will verify if the impairment is limiting a major life activity per the Americans with Disabilities Act. Accommodations or academic adjustments are often provided in order to “level the playing field” for the student-athlete with prolonged cognitive difficulties resulting from a concussion. A detailed academic plan coupled with accommodations can provide the needed support for a student-athlete as he or she returns to learning after a concussion.

The successful implementation of return-to-learn depends on several variables:

- Recognition that concussion symptoms vary widely among student-athletes, and even within the same individual who may be suffering a repeat concussion.
- Identification of a point person or case manager for the student-athlete who can navigate the dual obligations of academics and athletics.

- Identification of co-morbid conditions that may impair recovery, such as migraine or other headache conditions, attention-deficit hyperactivity disorder, anxiety and depression, or other mood disorders.
- Identification of campus resources that can help assure that student-athletes are provided their full rights during this transition period.

Campus resources vary, and may include the following:

- Learning specialists. Many college campuses have certified learning specialists who have specialized knowledge of medical conditions such as concussion and post-concussion syndrome. They usually work directly with the disability office.
- Office of disability services. Most campuses have a disability office that is responsible for verifying each student's impairment under the Americans with Disabilities Act Amendments Act (ADAAA). Sometimes there is a separate disability office and ADAAA office. In this case the first resource is the campus disability office. Concussion and mild traumatic brain injury are covered under ADAAA.

It is advisable for the concussed student-athlete's medical team to identify an academic point person and to be certain this academician is interwoven into the medical management plan. Because return-to-learn is often under-managed and under-recognized, there should also be broad discussions of this important paradigm with athletics departments across the country, engaging organizations such as the National Association of Academic Advisors for Athletics, the American College Personnel Association, NASPA, Student Affairs Administrators in Higher Education, the Coalition on Intercollegiate Athletics, National Athletic Trainers Association, College Athletic Trainers Society, American Medical Society for Sports Medicine and other allied organizations. Student-athletes are more likely to return successfully to full classroom activity in the setting of a proactive and well-integrated management plan.

SPORTS PARTICIPATION DEFINITIONS AND CONCUSSION EPIDEMIOLOGY

Concussion incidence varies among sports. The American Academy of Pediatrics published a classification of sports by contact in 2001. Then in 2013, the American Academy of Neurology's statement described contact and collision sports as those in which athletes purposely hit other athletes or inanimate objects. The purposeful collisions put athletes participating in this class of sports at greater risk for concussions. Limited contact sports were described

as those in which the force and the frequency of collisions, whether with other athletes or inanimate objects, are decreased. Noncontact sports were described as those in which players do not come in contact with athletes or inanimate objects by force.

The rate of concussion in NCAA sports can be assessed in various ways. Figure 1 demonstrates the rate of competition concussion per 1,000 student-athlete exposures. It is noteworthy that the higher rates occur in contact/collision sports. All meaningfully measurable rates occur in either contact/collision or limited contact/impact sports. It is also noteworthy that women have a higher rate of concussion than men for soccer and basketball. Another way to look at concussion is through annual estimates of the actual number of concussions within the sport, combining both practice and competition sessions. Figure 2 depicts the percentage of concussions from each sport given the total number of concussion in 14 NCAA sports.

Because of the large size of football teams and the higher rate of concussion relative to other sports, concussion incidence is highest in football. In assessing the available data, anticipating concussion risk can be made based on the sport; anticipating concussion risk can also be guided by impact expectation. For each sport, it is important to follow the institution's concussion management plan.

The NCAA reviewed various concussion guidelines in addition to the injury data across sports to classify sports by an expectation for impacts and collisions. Unlike the previous two classifications, this classification (Figure 3) lists lower-tier sports as limited contact because athletes are still at risk of a concussion both in sports and daily life.

POST-CONCUSSION RAMIFICATIONS

There is considerable controversy with regard to long-term implications of concussion. On one end of the spectrum, some claim that repeated concussions cause a neurodegenerative brain disease called chronic traumatic encephalopathy or CTE. On the other end of the spectrum, some claim that there are no significant long-term sequelae of concussion. The murky evidence lies somewhere in between.

Post-Concussion Syndrome. Post-concussion syndrome refers to prolonged concussion symptoms following concussion. It is not truly a "syndrome" because there is no core of consistent symptoms and there is no clear correlation with type or severity of concussion, biomarkers, or genetic/personality predisposition.

NCAA CONCUSSION POLICY AND LEGISLATION

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 health care 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

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 symp-

toms 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.

Effect of violation. A violation of Constitution 3.2.4.17 shall be considered an institutional violation per Constitution 2.8.1; however, the violation shall not affect the student-athlete’s eligibility.

Symptoms may be neurologic (e.g., dizziness, light sensitivity), cognitive (memory, attention deficits) and emotional (depression, anxiety). Post-concussion syndrome is best considered a neuropsychiatric disorder, and it is important to recognize that it has no bearing on the extent of, or expected recovery from, concussion. Post-concussion syndrome is best managed in a multidisciplinary manner that includes gradual increase in physical and cognitive activity. Management is distinctly different from acute concussion management, and individuals should not simply be relegated to prolonged rest, which may perpetuate the symptomatology.

Chronic Neurobehavioral Impairment. Cognitive and executive dysfunction has been described following multiple concussions. However, only two Class I studies exist, and these are for jockeys and rugby players. There

are seven Class II studies that include boxers, NFL players and soccer players, which demonstrate long-term cognitive impairment. Two studies show an association with apoE4 genotype, suggesting a genetic predisposition, and one study shows an association with a prior history of learning disability. There is one Class III study of NFL players. There is some correlation with magnitude of exposure and chronic neurobehavioral impairment in professional athletes, but the relationship between exposure and chronic neurobehavioral impairment in amateur athletes is uncertain. This may be from a combination of underpowered studies and possible brain adaptations that are different in younger individuals.

Depression. Depression also has been reported as a possible long-term manifestation of repeated concussion. Two Class II studies of retired NFL players note

an increased rate of depression in a dose-response manner, and one Class III study of retired NFL players notes a higher depression rate than the general population. There are also studies that show no clear relationship between depression and prior concussion. Of note: about 21 percent of college student-athletes report depression at baseline.

Chronic Traumatic Encephalopathy (CTE). CTE is a progressive neurodegenerative disease whose pathologic hallmark is abnormal tau deposition, with clinical manifestations of mood disorder, neuromuscular incoordination, dementia and death. There are not agreed-upon pathological and clinical criteria for CTE, although it seems clear that CTE is a distinct clinical entity from Alzheimer's disease. In a 2012 publication of CTE case series (Brain), CTE is described as a "progressive tauopathy that occurs as a consequence of repetitive mild traumatic brain injury." In the Zurich 2012 consensus paper, it is noted that "it is not possible to determine the causality or risk factors [of CTE] with any certainty. As such, the speculation that repeated concussion or sub-concussive impacts cause CTE remains unproven." The universal consensus in the NCAA Concussion Task Force was that we need to better understand CTE with regard to genetic predispositions and biomarkers. No task force member noted a clear cause-and-effect relationship between concussion and CTE.

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ENDORSEMENTS

The 'Consensus Best Practice, Diagnosis and Management of Sport-Related Concussion' has been endorsed by:

- American Academy of Neurology
- American College of Sports Medicine
- American Association of Neurological Surgeons
- American Medical Society for Sports Medicine
- American Osteopathic Academy for Sports Medicine
- College Athletic Trainers' Society
- Congress of Neurological Surgeons
- National Athletic Trainers' Association
- NCAA Concussion Task Force
- Sports Neuropsychological Society

RESOURCES

- **NCAA Concussion Fact Sheets and Video for Coaches and Student-Athletes**
Available at NCAA.org/SSI.
- **Heads Up: Concussion Tool Kit**
CDC. Available at www.cdc.gov/ncipc/tbi/coaches_tool_kit.htm.
- **Heads Up Video**
NATA. Streaming online at www.nata.org/Heads-Up.

GUIDELINE 2J

SKIN INFECTIONS

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. Institutions should promote hand- and personal-hygiene practices; educate athletes and athletics staff; ensure procedures for cleaning and disinfection of hard surfaces are followed; and verify the cleanup of blood and other potentially infectious materials is done according to the Occupational Health and Safety Administration (OSHA) Blood-borne Pathogens standard.

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. Hidradenitis suppurativa;
2. Parasitic skin infections
 - a. Pediculosis;
 - b. Scabies;
3. Viral skin infections
 - a. Herpes simplex;
 - b. Herpes zoster;
 - c. Molluscum contagiosum; and
4. Fungal skin infections
 - a. Tinea corporis (ringworm).
 - b. Tinea pedis (athlete's foot).

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 noninfectious 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 the 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



PREVENTING SKIN INFECTIONS

1. Keep hands clean by washing thoroughly with soap and warm water or using an alcohol-based sanitizer routinely
2. Encourage good hygiene
 - Immediate showering after activity
 - Ensure availability of adequate soap and water
 - Pump soap dispensers are preferred over bar soap
3. Avoid whirlpools or common tubs
 - Individuals with active infections, open wounds, scrapes or scratches could infect others or become infected in this environment
4. Avoid sharing towels, razors and daily athletic gear
 - Avoid contact with other people's wounds or material contaminated from wounds
5. Maintain clean facilities and equipment
 - Wash athletic gear and towels after each use
 - Establish routine cleaning schedules for shared equipment
6. 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
7. 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

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.

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 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 appropri-



ate 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 people) of the population is colonized in the nose with staph bacteria at a given time and approximately 1.5 percent (4.1 million people) 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, preven-

tion techniques and appropriate precautions if suspicious wounds appear. Each institution should develop prevention strategies and infection control policies and procedures.

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 noninfectious 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. An example would be a noncontagious/noninfectious skin condition covered by a gas impermeable dressing, pre-wrap and stretch tape that is appropriately anchored and cannot be dislodged. 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 discarding used bandages in the biohazard waste should be stressed to the athlete. (See Wrestling Rule 6.1.4.)

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 host event 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 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).

Adequately covered is defined as “the noninfectious/noncontagious lesion is covered by a gas impermeable dressing, pre-wrap and stretch tape that is appropriately anchored and cannot be dislodged throughout the sport activity.”

Bacterial infections

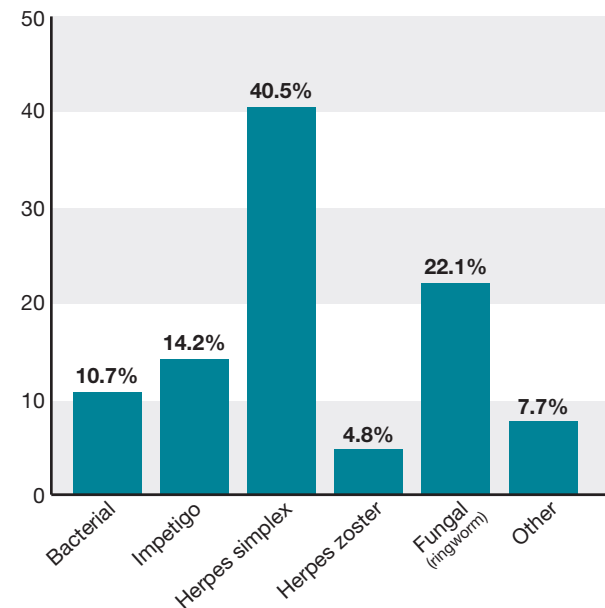
(Furuncles, Carbuncles, Folliculitis, Impetigo, Cellulitis or Erysipelas, Staphylococcal disease, MRSA)

1. Wrestler must have been without any new skin lesion for 48 hours before the meet or tournament.
2. Wrestler must have completed 72 hours of antibiotic therapy and have no moist, exudative or draining 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.

Percentage of infections in practices



Skin infections in practices, men's wrestling, 1993-1994 through 2003-2004 (n = 1151).

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 form on page 71 when making decisions for participation status.

CLEANING AND DISINFECTING ATHLETIC FACILITIES FOR MRSA

Shared equipment that comes into direct skin contact should be cleaned after each use and allowed to dry. Equipment, such as helmets and protective gear, should be cleaned according to the equipment manufacturers' instructions to make sure the cleaner will not harm the item.

1. Athletic facilities such as locker rooms should always be kept clean whether or not MRSA infections have occurred among the athletes.
2. Review cleaning procedures and schedules with the janitorial/environmental service staff.
 - Cleaning procedures should focus on commonly touched surfaces and surfaces that come into direct contact with people's bare skin each day.
 - Cleaning with detergent-based cleaners or Environmental Protection Agency (EPA)-registered detergents/disinfectants will remove MRSA from surfaces.
 - Cleaners and disinfectants, including household chlorine bleach, can be irritating, and exposure to these chemicals has been associated with health problems such as asthma and skin and eye irritation.
 - Take appropriate precautions described on the product's label instructions to reduce exposure. Wearing personal protective equipment such as gloves and eye protection may be indicated.
3. Follow the instruction labels on all cleaners and disinfectants, including household chlorine bleach, to make sure they are used safely and correctly.
 - Some key questions that should be answered by reading the label include:
 - How should the cleaner or disinfectant be applied?
 - Do you need to clean the surface first before using the disinfectant (e.g., pre-

cleaned surfaces)?

- Is it safe for the surface? Some cleaners and disinfectants, including household chlorine bleach, might damage some surfaces (e.g., metals, some plastics).
 - How long do you need to leave it on the surface to be effective (i.e., contact time)?
 - Do you need to rinse the surface with water after using the cleaner or disinfectant?
- If you are using household chlorine bleach, check the label to see if the product has specific instructions for disinfection. If no disinfection instructions exist, then use 1/4 cup of regular household bleach in 1 gallon of water (a 1:100 dilution equivalent to 500-615 parts per million [ppm] of available chlorine) for disinfection of pre-cleaned surfaces.
 - Environmental cleaners and disinfectants should not be put onto skin or wounds and should never be used to treat infections.
 - The EPA provides a list of registered products that work against MRSA (Available online at <http://epa.gov/oppad001/chem-regindex.htm>)
4. There is a lack of evidence that large-scale use (e.g., spraying or fogging rooms or surfaces) of disinfectants will prevent MRSA infections more effectively than a more targeted approach of cleaning frequently touched surfaces.
 5. Repair or dispose of equipment and furniture with damaged surfaces that do not allow surfaces to be adequately cleaned.
 6. Covering infections will greatly reduce the risks of surfaces becoming contaminated with MRSA.

Centers for Disease Control and Prevention
Available online at www.cdc.gov/mrsa/environment/athleticFacilities.html.

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 form on page 73 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

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. The only way that coverage ensures prevention of transmission is if the molluscum is on the trunk or most uppermost thighs, which are assured of remaining covered with clothing; Band-Aids are not sufficient.
3. Solitary or localized, clustered lesions can be covered with a gas impermeable dressing, pre-wrap and stretch tape that is appropriately anchored and cannot be dislodged.

Verrucae (wart)

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 but cannot be seeping.
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 considered appropriate therapeutic regimen to allow effective drug intervention for most tinea infections. The NCAA Skin Evaluation and Participation Status form shall be used to confirm time-under-treatment.
2. Status of lesions (activity) can be judged by KOH preparation or a review of documented therapeutic regimen.
3. On-site medical personnel will disqualify wrestlers with extensive, multiple lesions following assessment.
4. A minimum of two weeks of systemic (oral) anti-fungal therapy is required for scalp (diagnosed tinea capitis) lesions.
5. Active lesions may be covered to allow participation if lesions are in a body location that can be "adequately covered."
6. The final disposition of student-athletes with tinea

infections will be decided on an individual basis by the on-site examining physician or certified athletic trainer.

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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):

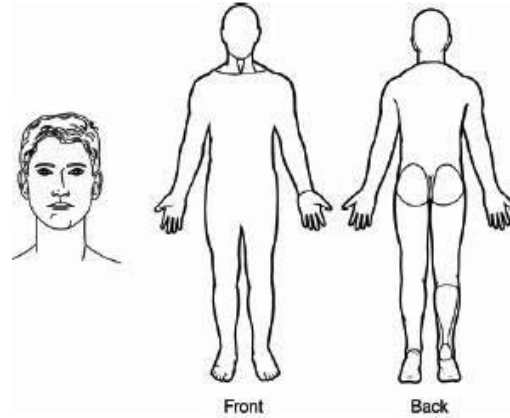
Dual(s)/Tournament: _____

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: _____

Specialty: _____

(M.D. or D.O.)

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.

GUIDELINE 2K

**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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GUIDELINE 2L

BLOOD-BORNE PATHOGENS

April 1988 • Revised August 2013

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 virus (HBV, HCV) and the human immunodeficiency virus (HIV). Infections with these (HBV, HCV, 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 1 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 1 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). 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 people from 12 to 24 years old. 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. 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 rec-

ommendation: 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 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. 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 karate.

ADMINISTRATIVE ISSUES

The identity of individuals infected with a blood-borne pathogen must remain confidential. Only those people 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 transmission of blood-borne pathogens and other potentially infectious organisms 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 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.

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 the 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 and presume all blood is infectious. 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, 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.
10. Post-exposure evaluation and follow-up. Following the report of any incident in which an athlete has nonintact skin, eye, mouth, mucous membrane or parenteral (under the skin) contact with blood or other potentially infectious materials, the athlete should seek a confidential medical evaluation and follow-up. This evaluation must be conducted by a licensed health care professional.

Disinfecting 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, the Occupational Safety and Health Administration (OSHA) and the Centers for Disease Control and Prevention (CDC).

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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GUIDELINE 2M

THE USE OF LOCAL ANESTHETICS

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), 1 or 2 percent; bupivacaine (Marcaine), 0.25 to 0.50 percent; and mepivacaine (Carbocaine), 3 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.

GUIDELINE 2N

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 acromioclavicular (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 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 student-athlete, 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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GUIDELINE 20

**MENTAL HEALTH:
INTERVENTIONS**

June 2006 • Revised 2012, July 2014

In November 2013, the NCAA Sport Science Institute hosted a Mental Health Task Force that included clinicians, scientists, administrators, coaches and student-athletes. A broad range of mental health issues were discussed, and a number of mental health research projects and initiatives were agreed to. Readers are encouraged to monitor developments at www.NCAA.org/ssi.

CONSIDERATIONS IN IDENTIFYING AND REFERRING STUDENT-ATHLETES WITH POTENTIAL MENTAL HEALTH ISSUES

The full range of mental health issues found in the general student population can also be found in the life of a student-athlete. The mental health of a college student is challenged by any number of factors of student life, and participation in athletics does not provide the student-athlete with immunity from mental health issues. Rather, participation in intercollegiate athletics imposes additional stressors on the student-athlete that can increase the risk for mental health issues. The unique stressors of intercollegiate athletic participation include the physical demands of training and competition, the time commitment to their sport, sustaining a time-loss, chronic or season-/career-ending injury, having difficulty interacting with teammates and coaches, and struggling with poor sports performance. This chapter offers suggestions in developing an institution's Student-Athlete Mental Health Considerations Plan. Each plan may vary from institution to institution; however, having a plan assists the athletics department in navigating the student-athlete's health and well-being.

Coaches, athletic trainers, team physicians, strength and conditioning staff, academic support staff, equipment managers and administrators are in position to observe and interact with student-athletes on a daily basis. In most cases, athletics department personnel have the trust of the student-athlete and are someone that the student-athlete turns to in difficult times or personal crisis. In some cases, the student-athlete will confide in a teammate and/or roommate. Also, there are some student-athletes who will not be aware of and/or inform anyone of their developing mental or emotional health issue, but will act out in nonverbal ways to let on that something is bothering them. In addition, some student-athletes will demonstrate behaviors that have at their root mental health issues. For example, someone who gets in fights when drinking and shows up late all the time may actually be struggling with depression.

BEHAVIORS TO MONITOR

The behaviors in the following list are not all-inclusive, may be singular or multiple in nature, and may be subtle in appearance. Concern is warranted when the following behaviors for a student-athlete change from his/her normal lifestyle:

- Changes in eating and sleeping habits.
- Unexplained weight loss.
- Drug and/or alcohol abuse.
- Gambling issues.
- Withdrawing from social contact.
- Decreased interest in activities that have been enjoyable, or taking up risky behavior.
- Talking about death, dying or "going away."
- Loss of emotion, or sudden changes of emotion within a short period of time.
- Problems concentrating, focusing or remembering.
- Frequent complaints of fatigue, illness or being injured that prevent participation.
- Unexplained wounds or deliberate self-harm.
- Becoming more irritable or problems managing anger.

SPORT PSYCHOLOGY

Commonly, the term "sport psychologist" can mean one of two things – someone who is licensed to practice psychology and can diagnose and treat mental health problems with a special emphasis on athletes, or someone trained to apply mental preparation techniques to athletes with an understanding of how physiological processes relate to performance.

While performance enhancement is a major part of sport psychology and often provides a psychologist entrée to discuss more serious clinical issues, some NCAA member institutions are hiring licensed, clinical psychologists to work with student-athletes on issues ranging from mental preparation for competition and relaxation to clinical depression and eating disorders. Licensed mental health professionals can enhance the medical care for student-athletes by:

- Providing mental health screening and prevention education.
- Conducting pre-participation evaluation screenings.
- Providing continuing care for concussion management.
- Managing eating disorders.
- Providing counseling on challenges and stresses related to being a student-athlete.
- Resolving conflict between athlete and coach, athlete and athlete, coach and administrator, athlete and parent, etc.

TRIGGER EVENTS

There are events that may serve to trigger or exacerbate a mental or emotional health concern with a student-athlete. Some examples:

- Poor performance, or perceived “poor” performance by the student-athlete.
- Conflicts with coaches or teammates.
- A debilitating injury or illness, resulting in a loss of playing time or surgery.
- Concussions.
- Class issues — schedule, grades, amount of work.
- Lack of playing time.
- Family and relationship issues.
- Changes in importance of sport, expectations by self/parents, role of sport in life.
- Violence — being assaulted, a victim of domestic violence, automobile accidents, or merely witnessing a personal injury or assault on a family member, friend or teammate.
- Adapting to college life.
- Death of a loved one or close friend.
- Alcohol or drug abuse.
- Significant dieting or weight loss.
- History of physical or sexual abuse.
- Gambling issues.
- Post-traumatic stress disorder (PTSD) for combat veterans who are now enrolled in college and participating in intercollegiate athletics.

- Serving as a key member of the athletics department catastrophic-incident team.

ESTABLISHING A RELATIONSHIP WITH MENTAL HEALTH SERVICES

Unless the athletics department staff member is a credentialed and practicing mental health care professional, the athletics department staff member should refrain from attempts to “counsel” a student-athlete who may be experiencing a mental health issue. Encouraging student-athletes, or “giving them permission,” to seek help from mental health providers that will help them gain insight into their situation, and encouraging athletes that seeking counseling is a sign of strength, not weakness, can be very useful.

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. The sports medicine staff is often a reasonable first resource for student-athletes who are not at imminent risk, yet who do not feel comfortable going directly to a mental health provider. If the student-athlete requests a mental health care evaluation, or is compelled to be evaluated because of behavior that violates an institutional code of conduct, then referring the student-athlete to the mental health care system at your institution is recommended. There are many avenues for the student-athlete to be referred. 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.

Understand that per institutional policy, unless a code of conduct violation has occurred, the student-athlete makes the final decision to go for a mental health

Available online at NCAA.org/SSI.



evaluation and care. The athletics department staff member can encourage the student-athlete to go for an evaluation and care, but unless there is a violation, or a threat of self-harm or harm to others, then, per institutional policy, the student-athlete can't be compelled to go for an evaluation or care.

It is recommended that a relationship be developed with the campus counseling services and any community mental health care professionals in order to facilitate referrals. **All athletic health care providers should be aware of such relationships. Ideally, the relationship can become part of the extended interdisciplinary health care team. (See Guideline 1B.)**

Confidentiality. The student-athlete's privacy must be respected unless he/she is at risk for self-harm or harm to others. The student-athlete may be encouraged to inform others about his/her care as appropriate. If the student-athlete is under age, then refer to your institutional general counsel and student affairs office for guidance in informing the parents or guardians.

Create a Supportive Environment. Coaches and sports medicine staff members should follow the following guidelines in order to help enhance 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.>").
- 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-athlete to the 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.

Emergency Considerations. If the student-athlete reports suicidal feelings or comments, or he/she reports feeling like harming others, follow the institution's mental health issue emergency protocol. Be sure the procedure is included in the athletics department plan. Include phone numbers, protocol in staying with the student-athlete, where to take the student-athlete on campus or in the community, and counseling services contact numbers. It is recommended to work with the student affairs office in developing this component of the plan, and be sure to contact appropriate institutional departments in the event of an emergency, per the institution's plan.

Institutional Review of Plan. Have the Student-Athlete Mental Health Considerations Plan reviewed and approved by the institution's general counsel, risk management, student affairs office and any other department recommended by the institution's general counsel.

MENTAL HEALTH CONDITIONS AND INTERCOLLEGIATE ATHLETICS

As with physical injuries, mental health problems may, by their severity, affect athletic performance and limit or even preclude training and competition until successfully managed and treated. Some examples include:

Mood Disorders

- Depression
- Suicidal Ideation

Anxiety Disorders

- Panic Attacks
- Stress
- General Anxiety
- Obsessive Compulsive Disorder
- Eating Disorders and Disordered Eating
- Substance Abuse Disorders

Depression is more than the blues, letdowns from a game loss, or the normal daily ups and downs. It is feeling "down," "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 decreased rates than nonathlete students. Approximately 9.5 percent of the population — or one out of 10 people — suffers 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 people's 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 experience depressed feelings in exactly the same way. However, with the proper treatment 80 percent of those who seek help and 50 percent of those who are clinically depressed get better, and many people begin to feel better in just a few weeks.

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 student-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 anyone 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 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 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.

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.

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 checkups, especially around high-risk times such as the loss of a coach or teammate, 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

WHAT TO LOOK FOR

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 unusual 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.

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.

www.nimh.nih.gov. Other resources include such programs as QPR (Question, Persuade, Refer) Gatekeeper training; the Jed Foundation ULifeline; and the Screening for Mental Health depression and anxiety screenings. Information about these programs, and ways to incorporate them into student-athlete checkups, can be found at NCAA.org.

SEEKING HELP

Most individuals who suffer from depression will fully

APPROACHING THE STUDENT-ATHLETE WITH A POTENTIAL MENTAL HEALTH ISSUE

Approaching anyone with a concern over mental well-being can be an uncomfortable experience. However, the health and wellness of the student-athlete is paramount. It is important to have facts correctly, with context, before arranging a private meeting with the student-athlete. The conversation should focus on the student-athlete as a person, not as an athlete. Empathetic listening and encouraging the student-athlete to talk about what is happening is essential. Consider questions that are open ended and encouraging for the student-athlete to talk about his or her issue:

- “How are things going for you?”
- “Tell me what is going on.”
- “Your behavior (mention the incident or incidents) has me concerned for you. Can you tell me what is going on, or is there something I need to understand or know why this incident happened?”
- “Tell me more (about the incident).”
- “How do you feel about this (the incident or the facts presented)?”
- “Tell me how those cuts (or other wounds) got there.”
- “Perhaps you would like to talk to someone about this issue?”
- “I want to help you, but this type of issue is beyond my scope as (coach, athletic trainer, administrator, support staff member), but I know how to refer you to someone who can help.”

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:

- Reported 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.
- Manic-type symptoms.

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GUIDELINE 2P

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 NONFUNCTION

When the absence or nonfunction of a paired organ constitutes the impairment, the following specific 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:

- The quality and function of the remaining organ;
- The probability of injury to the remaining organ; and
- 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 from 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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GUIDELINE 2Q

PREGNANCY

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:

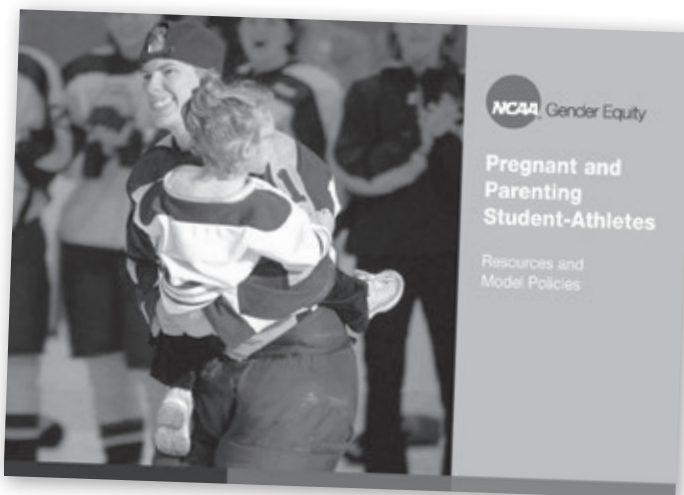
- Where the student-athlete can receive confidential counseling;
- Where the student-athlete can access timely medical and obstetrical care;
- How the pregnancy may affect the student-athlete's team standing and institutional grants-in-aid;
- That pregnancy should be treated as any other temporary health 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 spontaneous abortion in uncomplicated pregnancies. There are, however, theo-



WARNING SIGNS TO TERMINATE EXERCISE WHILE PREGNANT

- Vaginal bleeding
- Shortness of breath before exercise
- Dizziness
- Headache
- Chest pain
- Calf pain or swelling
- Preterm labor
- Decreased fetal movement
- Amniotic fluid leakage
- Muscle weakness

retical 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 also may 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 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 overexerted or when any warning signs (see page 91) 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 overheating.

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 1C.) 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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GUIDELINE 2R

THE STUDENT-ATHLETE WITH SICKLE CELL TRAIT

October 1975 • Revised June 2013

Sickle cell trait is not a disease and is not a barrier to exercise or participation in sport. 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 and 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 people with the trait become unable to concentrate urine nor-

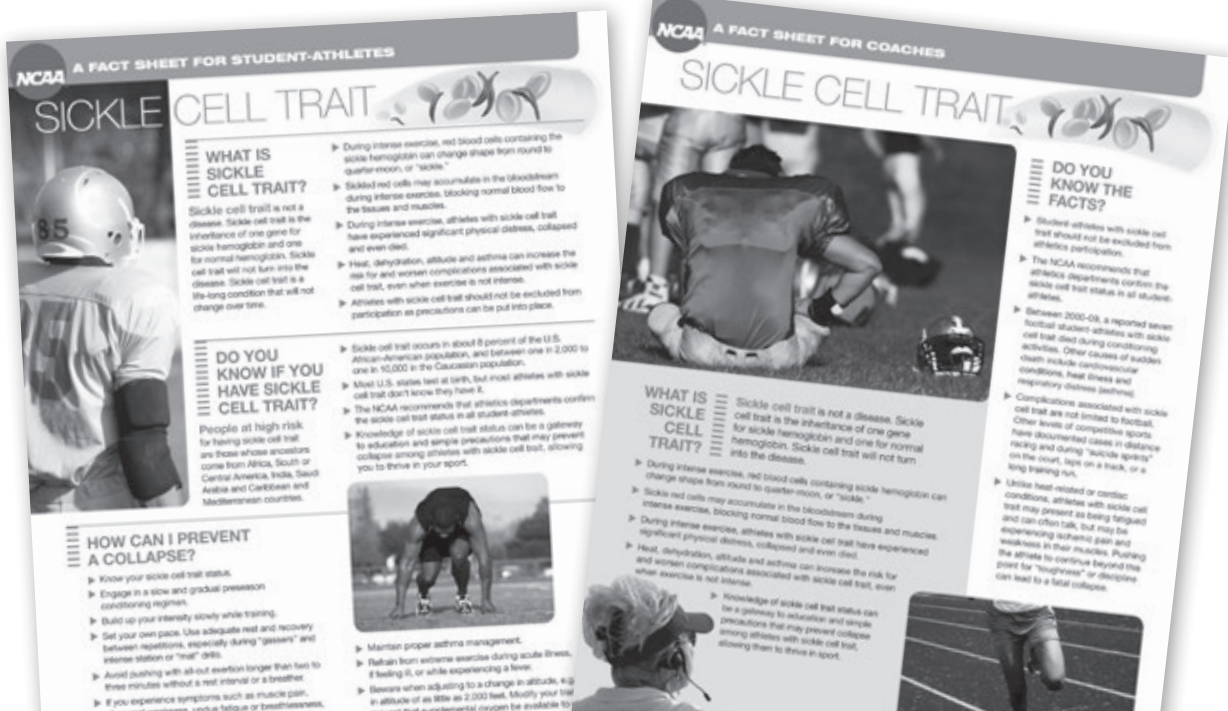
mally, but this is not a key problem for college athletes. Most athletes complete their careers without any complications. However, there are three constant concerns that exist for athletes with sickle cell trait: gross hematuria, splenic infarction, and exertional rhabdomyolysis, which can be fatal.

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 cell 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 rhabdo-

NCAA fact sheets and video for coaches and student-athletes are available at NCAA.org/SSI.



BEST PRACTICES

The NCAA has published best practices for fall sports preseason periods throughout guidelines in this handbook on emergency care, preseason preparation and heat illness prevention.

myolysis 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 cell 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 heatstroke, 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 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.

An exertional collapse in a student-athlete with sickle cell trait can be a medical emergency. Even the fittest athletes can experience a collapse. Themes from the literature describe athletes with sickle cell trait experiencing 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 collapsed athlete is covered in the references. In general, athletes with sickle cell trait may have more problems recovering during exercise or following a collapse and should be monitored closely.

Screening for sickle cell trait as part of the medical examination process is required in Division I, Division II and Division III institutions unless documented results of a prior test are provided to the institution or the student-athlete or prospective 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. 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.

Screening can be accomplished with a simple blood test that is relatively inexpensive. However, screening positives must be confirmed with additional diagnostic testing such as hemoglobin electrophoresis or high performance liquid chromatography (HPLC) to detect the specific hemoglobinopathies. 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. 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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GUIDELINE 2S

SUN PROTECTION

June 2012

Exposure to sunlight or ultraviolet (UV) light has a profound effect on the skin causing damage, premature skin aging, eye damage, immune system suppression and skin cancer. Repeated unprotected exposure to the sun's UVA and UVB rays can lead to sunburns, cataracts (clouding of the eye lens), photoaging and skin wrinkling and can contribute to skin cancer.

Skin cancer is the most common type of cancer and is thought to account for half of all cancers. About 3.5 million cases of nonmelanoma skin cancer (basal cell or squamous cell cancers, the two most common types of skin cancer) are diagnosed each year. Melanoma, the third most common type of skin cancer, accounts for fewer than 5 percent of skin cancer cases but causes a majority of skin cancer deaths.

RISK FACTORS

Skin cancer is largely preventable by limiting exposure to the primary source of ultraviolet (UV) radiation, sunlight. Reducing exposure to the sun's UV rays can decrease the risk of sunburn, skin cancer and photoaging. People with high levels of exposure to UV radiation are at an increased risk for all three major forms of skin cancer. The U.S. Environmental Protection Agency (EPA) estimates that the sun causes 90 percent of nonmelanoma skin cancers. Approximately 65 to 90 percent of melanomas can be attributed to exposure to UV radiation, and because a substantial percentage of lifetime sun exposure occurs before age 20, UV light exposure during childhood and adolescence plays an important role in the development of skin cancer. Other risk factors include lighter natural skin color and skin that burns, freckles, reddens easily, or becomes painful in the sun; appearance of moles (particularly an increased number of moles or an atypical mole or changing mole); family history of skin cancer; increasing age; and use of artificial UV radiation (e.g. tanning beds). Environmental factors that increase the amount of UV radiation exposure are also of importance to note, including latitude (closer distance to the equator), higher altitude, light cloud coverage (UV rays can penetrate clouds, windshields, windows and light clothing) and the presence of materials that reflect the sun (e.g. snow, pavement, water and sand).

PREVENTION

Unprotected skin can be damaged by the sun's UV rays in as little as 15 minutes. Reducing exposure to the sun's UV rays can decrease the risk of skin damage and developing skin cancer. Wearing

RISK FACTORS

Primary Risk Factors

Exposure to UV radiation is the most important risk factor for developing skin cancer. Other risk factors include:

- Those who have had at least one severe, blistering sunburn.
- A lighter natural skin color and skin that burns, freckles, reddens easily or becomes painful in the sun.
- Appearance of moles (particularly, an increased number of moles or an atypical or changing mole).
- Total amount of sun exposure over a lifetime.
- Use of artificial UV radiation (e.g. tanning beds).
- Family history of skin cancer.
- Increasing age.

Environmental Risk Factors

The hours between 10 a.m. and 4 p.m. daylight saving time (9 a.m. to 3 p.m. standard time) are the most hazardous for UV exposure outdoors. Environmental factors that increase the amount of UV radiation exposure include:

- Latitude (closer distance to the equator).
- Higher altitude.
- Light cloud coverage (UV rays can get through clouds, windshields, windows and light clothing).
- The presence of materials that reflect the sun (e.g. snow, pavement, water and sand).





broad spectrum (UVA and UVB) sunscreens and/or clothing to protect as much skin as possible when exposed to the sun are key components of a comprehensive skin protection program. Sunscreens help to prevent UV radiation from reaching the skin; however, no sunscreen provides complete and total protection. Avoiding the sun during the midday hours provides additional defense against skin damage. However, if the sun cannot be avoided, implementation of alternative sun protection measures (e.g. seeking shade, wearing a hat, protective clothing, sunglasses and using sunscreen) is paramount. With the right precautions student-athletes and athletics staff can participate safely in outdoor athletics activities.

Research suggests a need for improved primary prevention of UV damage among NCAA student-athletes. According to research, fewer than 10 percent of collegiate student-athletes reported using sunscreen regularly, defined as at least three of the previous seven days. Fifty-three percent of U.S. adults were “very likely” to protect themselves from the sun by practicing at least one sun protection measure. Another study of 290 student-athletes from two NCAA universities found that 96 percent of respondents believed sunscreen would help protect them from skin cancer. Yet, 43 percent of the student-athletes surveyed reported never using sunscreen, 31 percent reported only using sunscreen one to three days per week, 18 percent reported using sunscreen four to six days per week, and 8 percent reported using sunscreen every day of the week.

More than 250,000 NCAA student-athletes participate in outdoor sports. Sun protection measures should not reduce student-athlete participation. Institutions may find it difficult to avoid scheduling activities around the midday hours or when UV radiation is most damaging. Institutions should focus their efforts on promoting other protection measures (e.g. seeking shade;

PROTECTIVE MEASURES

Primary protective measures that help reduce the risk for skin cancer:

- Avoiding the sun between 10 a.m. and 4 p.m.
- Wearing sun-protective clothing when exposed to the sun.
- Using a broad spectrum sunscreen with a sun-protection factor (SPF) greater than or equal to 30.
- Avoiding tanning beds and other artificial sources of UV light.

wearing a hat and protective clothing; and using sunscreen), which can be implemented without compromising athletics participation while gradually making feasible scheduling changes.

Research suggests improved availability of sunscreen increases use among collegiate athletes. A study of collegiate women golfers reported the application of sunscreen increased significantly when athletes had easy access to sunscreen during practice and competition, highlighting an opportunity to improve sun-protective behaviors. A study, which included 13 NCAA outdoor sports, found that the percentage of athletes who wore sunscreen increased significantly with the frequency of coaches or athletic administrators speaking with them about sun protection.

PERSONAL SUN PROTECTION RECOMMENDATIONS

- Liberally and evenly apply a golf ball-sized amount (palm full) of a broad-spectrum sunscreen evenly over all exposed areas. For those with thin or thinning hair, apply sunscreen to the scalp, as well.
- Apply a broad spectrum sunscreen with an SPF greater than 30 before going outdoors.

- Reapply sunscreen every two hours and after swimming, perspiring and toweling off.
- Always wear protective clothing before going outside:
 - Long-sleeve shirts or sun sleeves.
 - A wide-brimmed hat to shade the face, head, ears, and neck (at least a 2- to 3-inch brim all around is ideal).
 - Sunglasses that wrap around and block as close to 100 percent of both UVA and UVB rays as possible.
- Do not use tanning beds or other artificial sources of UV light.
- Maintain proper hydration.

RECOMMENDATIONS FOR ATHLETICS HEALTH CARE PROVIDERS AND ATHLETICS ADMINISTRATORS

- Serve as a sun safety role model.
- Promote a culture of sun safety and awareness.
- Educate student-athletes and athletics staff about UV protection and skin cancer prevention.
- Use the preparticipation examination as an opportunity to educate student-athletes and parents about skin damage and skin cancer prevention.
- Assess athletics staff and each team's sun exposure patterns and reinforce sun-safe behaviors.
- Provide sun protection resources to student-athletes, coaches, athletics staff, administrators and institutional staff.
- Advocate for sun protection policies and practices with appropriate athletics and institutional administrators.
- Improve access to sunscreen for student-athlete use at every outdoor practice and competition.
- Encourage sunscreen and protective clothing (e.g. long-sleeve shirts, hats and sunglasses) as indispensable during outdoor practice as sports equipment.
- Consider ultraviolet protection factor (UPF) clothing for outdoor practice and competition uniforms.
- Stay in the shade whenever possible and assist athletics staff in choosing locations with shade for outdoor activities. Seek alternative methods of shade such as tents, umbrellas and shade from buildings.
- Make sun protection behaviors routine so that wearing protective gear and taking time out to reapply sunscreen become as much a part of athletics practices and competitions as water breaks.

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GUIDELINE 2T

EXERTIONAL RHABDOMYOLYSIS

July 2013

The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports acknowledges the significant input of Dr. Randy Eichner in the revision of this guideline.

Rhabdomyolysis is breakdown of skeletal muscle. In common use, however, rhabdomyolysis connotes an acute clinical syndrome of major muscle breakdown and leakage into the bloodstream of muscle contents (electrolytes, myoglobin, other proteins) as reflected by a sharp rise in serum creatine kinase (CK). The many causes of rhabdomyolysis can be categorized as: 1) trauma; 2) muscle hypoxia; 3) genetic defects; 4) infections; 5) body temperature changes; 6) metabolic or electrolyte disturbances; 7) drugs or toxins; and 8) exercise. This guideline focuses on rhabdomyolysis from exercise, or exertional rhabdomyolysis (ER). The first case series of ER was in 1960 in Marines doing squat jumps. ER also occurs in police and firefighter trainees, in overeager weightlifters and novice extreme exercise participants, in prisoners who overexert, in fraternity men who endure exercise hazing, in school kids pushed too hard in physical education class, and in recreational athletes who overdo it in training or competition. This guideline will focus on the NCAA student-athlete.

RECOGNITION

Exertional rhabdomyolysis occurs in the setting of strenuous exercise and can range from mild to severe. Clinical signs are often nonspecific: muscle pain, soreness, stiffness, and, in severe cases, weakness, loss of

mobility, and swollen, tender muscles. Severe ER is far more problematic than the milder form known as delayed onset muscle soreness (DOMS), in which muscles become sore and stiff in the first few days after a bout of unaccustomed, moderately strenuous exercise. DOMS is rarely a clinical problem and tends to be self-limited with only relative rest or a cutback in level of training. An even milder form of ER is the physiologic breakdown of muscle that commonly occurs while athletes train. This physiological muscle adaption to exercise overload has few or no symptoms, or only mild muscle symptoms that are generally ignored by the athlete, and so is manifest only by an elevation in serum creatine kinase (CK) – a condition sometimes called hyperCKemia.

Unlike hyperCKemia or DOMS, severe ER is a major health concern for any athlete. A challenge to the early recognition of ER for the athlete and clinician is that signs and symptoms of it during the triggering bout of intense exercise can be few and subtle. But there are clues that coaches and athletic trainers can watch for outlined by case examples involving team outbreaks. Importantly, signs and symptoms of severe ER can begin in the first few hours after the triggering exercise bout and tend to peak over the subsequent two days.

SEVERE EXERTIONAL RHABDOMYOLYSIS

The clinical diagnosis of severe exertional rhabdomyolysis soon after an overly intense exercise bout is a physician's judgment call that hinges in part on the fol-

SERIAL POSTURES OF EXERTIONAL COLLAPSE



- Athletes in active recovery to early fatigue: continue rehydration, rest intervals, cooling and controlled breathing.
- Athletes who are showing signs of physical distress should be allowed to set their own pace while conditioning. Instruct athletes to rest while experiencing symptoms as they may soon feel better and be ready to continue. If symptoms reoccur or progress, the athlete should stop exercise and be assessed by a health care provider.
- Athletes unable to stand on their own from a kneeling position or having trouble walking normally during recovery should raise suspicion of distress, and additional medical intervention should be considered.

lowing features that help separate severe ER from the overlapping but milder DOMS:

- Muscle pain more severe and sustained than expected.
- Swelling of muscles and adjacent soft tissues.
- Weak muscles, especially in hip or shoulder girdle.
- Limited active and passive range of motion.
- Brown (“Coca-Cola”) urine from myoglobin.

The clinical diagnosis of ER is commonly confirmed by documenting an elevated serum creatine kinase level. This raises the question of how to interpret CK levels. Several variables must be considered.

First, men tend to have CK levels about twice as high as women, and African-American men tend to have CK levels about twice as high as white men. These gender and ethnic differences in baseline CK level may in part reflect differences in muscle mass, muscle-fiber type and habits of physical activity.

Second, athletes tend to have CK levels higher than nonathletes, and CK can vary by sport and stage of training. For example, in a study of 12 Division I football players during two-a-days, mean CK was normal at the start (about 200 U/L), but by Day 4 had risen 25-fold (to about 5,000 U/L). Despite this sharp rise in CK level, all 12 players practiced football throughout the 10-day study without complications.

Third, there can be a wide range of serum CK elevation among exercising athletes. This was seen in the above football study, and is even more striking in laboratory studies that control the type and duration of exercise. For example, when college men perform the same bout of elbow-flexor exercise, the peak CK response can vary 100-fold, from about 250 U/L to about 25,000 U/L.

Fourth, the rate of rise in CK levels can vary in developing exertional rhabdomyolysis cases. This rate can be slow, over three to four days to a peak CK, as in the elbow-flexor exercise studies; or it can be rapid, as in exertional collapse in athletes or soldiers with sickle cell trait (SCT), where serum CK can reach 100,000 U/L in a few hours and exceed 1 million U/L by the next day.

Given these variables, what level of CK confirms ER that requires action? The U.S. military advises the following action for severe muscle pain if the CK is five times the upper limit of normal (ULN): oral hydration, relative rest and re-evaluation the next day. If the CK is greater than

CASE 1: FOOTBALL

Thirteen football players were hospitalized for ER following the first team workout after their three-week winter break. The workout was characterized as some upper body work and sled pushing with 100 timed back squats at 50 percent top weight for one repetition. The institution’s investigative committee concluded that the back squats were the likely cause of the ER and said that coaches told the players that the workout would be a tough challenge that “would demonstrate who wanted to be on the team.” Within the first two days, players reported with dark urine and severe leg pain, with complaints of difficulty putting on shoes or climbing stairs. These symptoms continued for days until ER was diagnosed in the players. All athletes went home over the next few days as symptoms subsided, and all but one returned to play within the next few weeks.

Another football team outbreak of ER occurred in January out-of-season training at a Division I institution. It was similar in some ways to the previously mentioned outbreak, occurring soon after a winter break transition period and including an intense back-squat drill. Up to five players developed ER, and one player had bilateral fasciotomy for thigh compartment syndrome.

5,000 U/L, the military advises referral to a medical treatment facility for full clinical and laboratory evaluation, intravenous hydration and possible hospital admission. These low CK values for clinical action cast a wide safety net but seem to conflict with research on ER in basic military training (BMT). In a recent study of 499 recruits during two weeks of BMT in hot and cool climates, none developed “clinically significant” ER (defined by muscle weakness, elevated CK, and myoglobin in serum or urine), although muscle pain and soreness were common, and nearly 90 percent of recruits had elevations in CK. At Day 7 of BMT, the range in CK levels was wide, from about 55 U/L to about 35,000 U/L; just more than 25 percent of the recruits had a CK greater than five times the ULN, and just more than 10 percent had a CK greater than 10 times the ULN.

The military researchers concluded that any ER in recruits in BMT is not “clinically significant” if there is no muscle weakness or swelling, no myoglobin in the urine,

no laboratory evidence of acute kidney injury (AKI) or electrolyte imbalance, and if the CK is less than 50 times the ULN. If this can be translated to sports medicine, given that the ULN for CK tends to be about 200-250 U/L, then any ER in an athlete is not necessarily “clinically significant” if the serum CK is less than 10,000-12,500 U/L. This may be true, but it casts too narrow a safety net, because in fulminant ER from exertional collapse in the athlete with sickle cell trait, for example, the initial CK in the emergency room can be less than 1,000 U/L, but the CK can increase exponentially in a few hours to 50,000-100,000 U/L. The bottom line is that wise and timely clinical decisions in athletes with ER are not easy and require informed physician judgment. Some lessons can be learned from recent NCAA team outbreaks of ER.

LESSONS FROM TEAM OUTBREAKS: 10 FACTORS THAT CAN INCREASE THE RISK OF EXERTIONAL RHABDOMYOLYSIS

1. Athletes who try the hardest — give it their all to meet the demands of the coach (externally driven) or are considered the hardest workers (internally driven).
2. Workouts not part of a periodized, progressive performance enhancement program (e.g., workouts not part of the annual plan).
3. Novel workouts or exercises immediately following a transitional period (winter/spring break).
4. Irrationally intense workouts intended to punish or intimidate a team for perceived underperformance, or to foster discipline and “toughness.”
5. Performing exercise to muscle failure during the eccentric phase of exercise such as repetitive squats (e.g. the downward motion of squats) and then pushed beyond to continue.
6. Focusing a novel intense drill/exercise on one muscle with overload and fast repetitions to failure.
7. Increasing the number of exercise sets and reducing the time needed to finish (e.g., 100 squats, timed runs, station drills).
8. Increasing the amount of weight lifted as a percentage of body weight.
9. Trying to “condition” athletes into shape in a day or even over several days, especially with novel exercises or loads.



10. Conducting an unduly intense workout ad hoc after a game loss and/or perceived poor practice effort.

RISK FACTORS FOR ER

Exertional rhabdomyolysis in an NCAA team athlete is commonly linked to three conditions:

- Novel overexertion.
- Exertional heatstroke.
- Exertional collapse with complications in athletes with sickle cell trait.

Novel overexertion is the single most common cause of exertional rhabdomyolysis and is characterized as too much, too soon, and too fast. Team outbreaks of ER in NCAA athletes (refer to case examples) have similarities of irrationally intense workouts designed and conducted by coaches and/or strength and conditioning personnel.

Consistent factors in military service ER cases include low baseline fitness and repetitive eccentric exercises.

Eccentric exercise is when a muscle contracts as an external force tries to lengthen it. Examples include downhill running, squats, push-ups, sit-ups, pull-ups, chair dips, plyometrics and lowering weights. Even though almost every athletic workout has an eccentric component, ER often occurs when exertion is pushed beyond the point at which fatigue would normally compel an individual to stop, such as what can occur during group exercise under demanding supervision or peer pressure.

Exertional heatstroke (EHS) and ER share common risk factors such as history of prior heat illness, elevated environmental heat and humidity, dehydration, or the abuse of stimulants. ER can accompany EHS but is rarely if ever the vital problem. Deaths in EHS are from heat damage to vital organs; the victim dies with some ER, but not directly from ER. In contrast, sickle cell trait is a critical risk factor for ER as deaths have been attributed directly to a seemingly unrecoverable metabolic cascade of ER. How to approach both EHS and sickle cell trait are covered in separate guidelines elsewhere in this handbook.

Other risk factors for ER are either rare or would preclude top athleticism in the first place. These include a severe viral invasion of the muscles, gravely low blood potassium, or an inborn metabolic myopathy. Among the drugs considered risk factors for ER, special consideration should be given to stimulants and pre-workout supplements.

Novel overexertion is by far the most common cause of ER; with early diagnosis and proper therapy, this condition is benign. For example, a recent brief review reported nearly 400 cases of ER (absent EHS or SCT) from novel overexertion in soldiers, athletes or other young people. All were benign. In sharp contrast, both EHS and exertional sickling can be fatal. However, ER from novel overexertion can lead to mild AKI, and/or muscle compartment syndrome, which if not treated promptly can lead to long-term disability.

It is vital that all coaches, strength and conditioning personnel, and athletic trainers prevent ER from novel overexertion, recognize it early and activate their emergency action plan while notifying the team physician for full clinical and laboratory assessment, rehydration to ensure good urine output, pain relief, and monitoring for acute compartment syndrome. After treatment for ER, the physician must assess the athlete for risk of recurrence, consider further testing, and decide on

CASE 2: FOOTBALL SUMMER CAMP

A team outbreak of ER occurred in a small high school. A new football coach introduced an intense, novel, triceps-focused drill, alternating chair dips and push-ups on the first day of a summer camp. This reported workout involved five consecutive bouts, with fast repetitions, competitive motivation and no rest periods. Over the next few days, half of the team members went to the hospital for ER, 12 were admitted, and three had surgery (fasciotomy) to release triceps muscle compartments under high pressure from the ER (compartment syndrome). The risk of ER was higher in the harder working players.

CASE 3: SWIMMING

On a Day 1 practice after a summer break, the 41 members of a Division I swim team met a new coach and a new, grueling drill before their usual two hours of swimming. The drill was as many push-ups as possible in a minute, followed by as many body squats as possible in a minute, with the sequence repeated for 10 minutes. Other upper body workouts continued on Days 2-3, along with swim practice. Beginning on Day 2 and continuing on subsequent days, several swimmers, men and women, presented with severe pain, swelling, and limited motion of the triceps and pectoral muscles, and dark urine. All were hospitalized. All went home in three to six days as their symptoms subsided, and all returned to college swimming.

when, if and under what conditions the athlete can safely return to play. A three-phase return-to-play guideline is recommended for athletes deemed as low risk for recurrence (refer to O'Conner et al reference). Athletes with recurrent rhabdomyolysis or cramping should seek additional testing by a specialist.

TIPS FOR PREVENTION AND EARLY RECOGNITION OF ER FROM NOVEL OVEREXERTION

- Moderation. Avoid too much, too soon, too fast. Educate everyone in the athletics department conducting exercise sessions – especially the

CASE 4: LACROSSE

On Day 1, after a three-month hiatus, a women's NCAA lacrosse team did three sets of 20 biceps curls with weights. The next day, several of them had painful, stiff, swollen biceps muscles. They gradually improved and by three weeks were back to full participation. They all completed the competitive season.

CASE 5: LACROSSE

An outbreak of ER in NCAA women's lacrosse occurred after a team lost its first game of the season. The student-athletes' next workout was reported to focus on the upper body and was new to them, with limited recovery on subsequent days. Exercises included many pull-ups, chin-ups and dips. Subsequent complaints included arms feeling "prickly, tingly" and being shaky and stiff; difficulty raising arms overhead to catch balls; and difficulty driving because of sore and stiff arms. Athletes experienced dark urine and were hospitalized for ER three days after the initial workout. All went home over the next three to five days, and all but one soon returned to lacrosse. The athlete who did the most pull-ups had the worst and longest course of ER.

coaches/strength and conditioning personnel – on all aspects of exertional rhabdomyolysis from novel overexertion and the additive effect of all physical exertion on the athlete.

- Strength and conditioning workouts are the highest risk rather than sport skills, drills or competitions. Group workouts in general can be risky if they drive all athletes at the same pace and intensity. Sometimes the athlete who tries the hardest to meet the demands of his/her coach suffers the worst ER.
- Avoid high-intensity conditioning workouts after vacations or seasonal breaks or on returning from injury. Athletes cannot be "conditioned into shape" in a day.
- The design of a workout should reflect a collaborative effort between a strength and conditioning coach and medical staff. However, athlete safety assumes the individual conducting the exercise sessions takes reasonable actions to allow recovery and prevent exertional collapse.
- All training programs should start slowly, build gradually, include adequate rest, and allow for individual differences. Avoid reckless intensity in an effort to make everyone bigger, stronger and faster.
- Workouts are meant to improve fitness, skills and athletic performance. They should be rational, physiologic and sport-specific. Avoid the use of additive physical activity as punishment or for building toughness.
- Athlete's physical readiness changes day to day. Encourage athletes to set their own pace or at least communicate with them frequently to learn if undue symptoms are developing. As the workout ends, watch them closely and ask them how they feel. Athletes who are showing signs of physical distress should be allowed to set their own pace while conditioning.
- Fluids should be regularly available, and frequent breaks should be scheduled.
- Set the right tone. Workouts are to enhance performance, not to punish or intimidate. Never use exercise as a form of punishment in an athlete experiencing physical distress. Athletes should feel free to report any symptom at any time and obtain immediate help. Athletic trainers should be authorized to step in to provide care for an athlete in distress at any time without retribution.
- Encourage athletes to read their body, cut back or stop if they start to struggle, and report immediately any concerning symptom, especially any peculiar, atypical or undue muscle discomfort, pain, swelling, stiffness or weakness.
- Post a urine-color chart in the locker room, athletic training room, and near urinals and restroom stalls. Athletes should report dark urine immediately.
- If one athlete on a team develops early signs or symptoms of possible ER, evaluate all members of the team who participated in the exercise session for ER.
- Design, file and practice an emergency action plan (EAP) for exertional heatstroke (EHS) and for exertional sickling in sickle cell trait (SCT). Coaches should be ready to intervene when athletes show signs of distress. Minutes count in these life-threatening emergencies. See the guidelines in this handbook on EAP, EHS and SCT.
- If you suspect that an athlete is developing ER from novel overexertion (absent EHS or SCT), the EAP should be activated, and the team physician should be promptly notified.

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3 EQUIPMENT



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.

American Society for Testing and Materials (ASTM) International is one organization that creates specifications, test methods and practices for sports equipment, surfaces and facilities to reduce inherent risk of injuries. The National Operating Committee

on Standards for Athletic Equipment (NOCSAE) mark on a helmet or Hockey Equipment Certification Council (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.



MANDATORY EQUIPMENT AND SPECIAL EQUIPMENT RULES

| 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 ½-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 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. Equipment that could cut or cause an injury to another player is prohibited, without respect to whether the equipment is hard. 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 a maximum of 2.1 millimeters and from wires with a minimum gauge of 1 millimeters 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> |

MANDATORY EQUIPMENT AND SPECIAL EQUIPMENT RULES

| Sport | Mandatory Protective Equipment | Rules Governing Special Protective Equipment |
|-----------------------------------|---|--|
| <p>5. Football</p> | <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 reconitioner'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 (FDCS) 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. 4. Projection of metal or other hard substance from a player's person or clothing. |
| <p>6. Gymnastics</p> | <p>None</p> | <p>None</p> |
| <p>7. Ice Hockey</p> | <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. |
| <p>8. Women's Lacrosse</p> | <ol style="list-style-type: none"> 1. The goalkeeper must wear a helmet with face mask, separate throat protector, a mouthpiece and 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). | <p>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.</p> |

MANDATORY EQUIPMENT AND SPECIAL EQUIPMENT RULES

| Sport | Mandatory Protective Equipment | Rules Governing Special Protective Equipment |
|--------------------------------|---|--|
| 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 shinguards, chest protectors and throat protectors. |
| 10. Rifle | Shooters and range personnel in the immediate vicinity of the range required to wear hearing protection during smallbore. Shooters are urged to wear shatterproof eye protection. | None |
| 11. Soccer | Players shall wear shinguards under the stockings in the manner intended, without exception. The shinguards shall be professionally manufactured, age and size appropriate and not altered to decrease protection. The shinguards 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 necklaces 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. An 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 a pitcher, they cannot be distracting on the nonpitching arm. If worn on the pitching arm, they may not cause safety risk or unfair competitive advantage. |
| 14. Swimming and Diving | None | None |
| 15. Track and Field | Pole vault box collar pad that meets ASTM standard beginning December 1, 2013. | <ol style="list-style-type: none"> 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. 2. In the pole vault, the use of a forearm cover to prevent injuries is permissible. |

MANDATORY EQUIPMENT AND SPECIAL EQUIPMENT RULES

| Sport | Mandatory Protective Equipment | Rules Governing Special Protective Equipment |
|-----------------------|---------------------------------|--|
| 16. Volleyball | None | <ol style="list-style-type: none"> 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. 2. All jewelry must be removed. Earrings must be removed. Taping of earrings or other jewelry is not permitted. 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 slow rebounding foam. |
| 17. Water Polo | Cap with protective ear guards. | None |
| 18. Wrestling | Protective ear guard. | <ol style="list-style-type: none"> 1. Anything that does not allow normal movement of the joints and prevents one's opponent from applying normal holds shall be barred. 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 mouthguard. 3. Jewelry is not allowed. |

GUIDELINE 3B

EYE SAFETY IN SPORTS

January 1975 • Revised August 2013

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 people 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 recommend-

ed 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.

Sports with a moderate to high risk of eye injury include basketball, baseball, softball, lacrosse, field hockey, ice hockey, fencing, rifle, tennis, soccer, volleyball, water polo, football, golf and wrestling.

The most common sports vision concerns include:

1. **Protection:** Athletes' eyes need certified sports protective eyewear that will protect against injury with lenses that protect from impact and ultra-violet light.
2. **Correction:** Spectacle wearers require sports protective eyewear that also will correct their vision, while contact-lens wearers may need a different lens than their everyday one.



- 3. Vision enhancement:** Athletes may desire help enhancing their binocularity or depth perception.

The American Academy of Ophthalmology recommends that head, face and eye protection should be certified by either the Hockey Equipment Certification Council (HECC — www.hecc.net), the National Operating Committee on Standards for Athletic Equipment (NOCSAE), 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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GUIDELINE 3C

MOUTHGUARDS

January 1986 • Revised August 2007

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.



MANDATORY EQUIPMENT AND SPECIAL EQUIPMENT RULES

| 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.e) | Readily visible color (not white or transparent) | Yes | Regular season competition, postseason competition and NCAA championships |
| Ice Hockey | All | Mandatory (NCAA 9.5) | 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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GUIDELINE 3D

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 on student-athlete health and well-being. 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 and penalized 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).

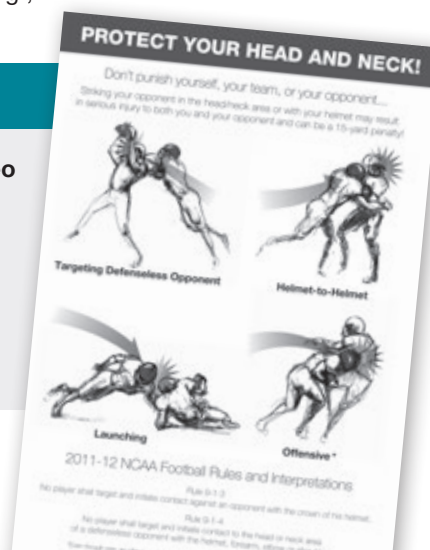
Football and all contact sports should be concerned with the prevention of catastrophic head injuries. The rules against butting, ramming and spearing with the helmet are for the protection of the helmeted player and the opponent. A player who does not comply with these rules in any sport is at risk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

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RESOURCES

1. **NCAA Concussion Fact Sheets and Video**
Available at NCAA.org/SSI.
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.



GUIDELINE 3E

HELMET FITTING AND REMOVAL

June 1990 • Revised June 2013

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, function-

al, 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 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 face mask, the airway cannot be controlled or ventilation provided;
3. After a reasonable period of time, the face mask 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 face mask 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 face mask removal and should frequently practice removal techniques for face masks 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 and places the athlete and opponents at risk for a catastrophic injury.**

SOFT HEADGEAR USE IN NONHELMETED SPORTS

When considering the use of this optional equipment during practice or permitted competition, athletes and coaches should take the time to read the qualifying statements provided with such a product addressing its limitations, particularly to prevent serious head injuries. If protective soft headgear or headbands are

to be used in a sport then they should be manufactured under the guidelines of an accepted standard for that sport.

The NCAA does not view the use of soft headgear products as equipment for the prevention of concussion in nonhelmeted sports. As explained below, soft headgear products may be worn in nonhelmeted sports whose rules allow for such optional equipment, but the purpose of that equipment should be for reasons other than concussion prevention. It should be noted that there is no helmet that can prevent a concussion. There continues to be a need for valid scientific evidence that the use of such products decreases the incidence of concussion.

In nonhelmeted sports requiring a medical waiver for the use of such optional equipment, use of soft headgear as a condition to be medically cleared to play sports is ineffective. Therefore, the NCAA will not provide medical waivers for the use of soft headgear for the prevention of concussion in order to be medically cleared to play sports.

Current design and recommended use of these devices fail to address the proposed primary mechanism of concussive injury, that being rotational acceleration and deceleration forces acting on the brain. Institutions should refer to equipment standards from NOCSAE, ASTM, HECC and CPSC when considering protective equipment for student-athletes and ensure



the equipment is used for mitigating the risk of injuries for which they are designed.

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FIT AND FASTEN!

Buckle Up Completely.

Loss of Helmet During Play.
If a player's helmet comes off during play, he must not continue to participate in the play to prevent injury. If the helmet comes off either than as the direct result of an opponent's foul, the player must also leave the game and is not allowed to participate for the next play.

- Snug, comfortable fit.
- Should not wobble, tilt or rotate when twisted.
- Check air inflation daily.
- Follow manufacturer's guidelines for fit and care.

WARNING
Do not use this helmet to butt, ram or spear an opposing player. This is in violation of the football rules and each use may result in severe head or neck injuries, paralysis or death to you and possible injury to your opponent.

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 people 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 people 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 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



APPENDIX A

2014-15 NCAA BANNED DRUGS

July 2014

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. Examples of substances under each class can be found at NCAA.org/drugtesting.

The penalty for a positive drug test for a banned substance other than a "street drug" shall be the loss of a season of eligibility and withholding from competition in all sports for 365 days from the date of the drug test.

The penalty for a positive drug test for a "street drug" is withholding from competition in all sports for 50% of a season from the date of the test.

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/milliliter.

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).

APPENDIX B

NCAA LEGISLATION INVOLVING HEALTH AND SAFETY ISSUES

July 2014

This chart should be used as a quick reference for NCAA legislation involving health and safety issues that appears in the 2014-15 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 for Use of Banned Drugs | 18.4.1.5 | A positive test for substance on the list of banned drug classes, other than street drugs, as set forth in Bylaws 31.2.3.4 and 14.1.1.1 results in loss of eligibility. |
| | Effect on Eligibility | 18.4.4.5.2 | A positive test for "street drugs" will result in a loss of competition during a minimum of 50 percent of the season |
| | Effect on Championship Eligibility | 18.4.1.5 | A positive test for a substance on the list of banned drug classes, other than street drugs, 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), 13.1.1.2.5 (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-(g) (Div. I) | Institutions must designate an individual (or individuals) as an athletics department resource for questions related to NCAA banned drugs and nutritional supplements. |
| | Education | 14.1.4.2 | All student-athletes shall be provided the list of banned drug classes; receive education about products that might contain banned drugs; and be notified of changes and updates during the academic year. |

REGULATIONS INVOLVING HEALTH AND SAFETY ISSUES

| Topic | Issue | NCAA Bylaw Cite | Comments |
|--------------------------------|---|---|--|
| Banned Drugs | | 3.2.4.7-(h) (Div. I) | Institutions must educate athletics department staff members who have regular interaction with student-athletes that: (1) the NCAA maintains a list of banned drug classes and provides examples of banned substances in each drug class on the NCAA website; (2) any nutritional supplement use may present risks to a student-athlete's health and eligibility; and (3) questions regarding NCAA banned drugs and the use of nutritional supplements should be referred to the institution's designated athletics department resource individual (or individuals). |
| Drug Testing | Banned Drugs and Drug-Testing Methods | 3.2.4.9 (Div. II) | 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 the 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); 14.1.4.2, 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), 14.1.4.3 (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. III only) | 14.1.4.4 (Div. I), 14.1.4.3 (Div. III) | Failure to properly administer drug-testing consent form is considered an institutional violation. |
| Drug Rehabilitation | Drug Rehabilitation Program Expenses | 16.4 | 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. |
| 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, 17.1.8 (Div. I); 17.1.9 (Div. II); 17.1.6.3 (Div. III) | Use of tobacco products is prohibited by all game personnel and all student-athletes in all sports during practice and competition. |

REGULATIONS INVOLVING HEALTH AND SAFETY ISSUES

| Topic | Issue | NCAA Bylaw Cite | Comments |
|--|---|---|--|
| Medical Expenses | Permissible Medical Expenses | 16.4 | Permissible medical expenses are outlined. |
| | Eating Disorders (Div. I and Div. II only) | 16.4 | 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 | Institution may cover or provide transportation to and from medical appointments. |
| | Summer Conditioning - Basketball | 13.2.7 | An institution may finance medical expenses for a prospect who sustains an injury while participating in an on-campus evaluation; a voluntary summer workout conducted by an institution's strength and conditioning coach; or required summer athletic activities. |
| | Summer Conditioning - Football | 13.2.8 | 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 Basketball and Football (Div. I only) | 13.2.9 | 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. |
| | Certification of Insurance Coverage | 3.2.4.8 (Div. I and Div. III) | Institutions must certify insurance coverage for medical expenses resulting from athletically related injuries sustained while participating in a covered event. |
| 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, 14.1.5 (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. |

REGULATIONS INVOLVING HEALTH AND SAFETY ISSUES

| Topic | Issue | NCAA Bylaw Cite | Comments |
|--|---|---|--|
| Medical Records and Consent Forms | Medical Examinations During Campus Visit | 13.11.2.6.1 (Div. I) | During a prospective student-athlete's visit to campus, a member institution, through its regular team or other designated physician, may conduct a medical examination to determine the prospective student-athlete's medical qualifications to participate in intercollegiate athletics, provided no athletics department staff member other than the athletic trainer is present. |
| | 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 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 By-laws 17.1.6.2.2 and 17.1.6.2.3 (Div. I) for additional exceptions. | 17.1.6.2.2, 17.1.6.2.4 (Div. I); 17.1.6.2, 17.1.6.2.1 (Div. II) | Outside 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), 17.1.4.1 (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 before 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 before 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). |

REGULATIONS INVOLVING HEALTH AND SAFETY ISSUES

| Topic | Issue | NCAA Bylaw Cite | Comments |
|------------------------------------|--|--|---|
| Student-Athlete Welfare and Safety | Voluntary Summer Conditioning (Div. I only) | 13.11.3.10 (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 before 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) | 13.11.3.10.4 | 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. |
| | Strength and Conditioning Coach Certification (Div. I. only) | 11.1.5 | A strength & conditioning coach shall be certified and maintain current certification through a nationally accredited strength and conditioning certification program. |
| | Sport safety training | 17.1.6 (Div. I) | An institutional staff member with current certification in first aid, cardiopulmonary resuscitation (CPR) and automatic external defibrillator (AED) use must be present any time a student-athlete participates in a physical, countable athletically related activity. |
| | 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. |
| | Sports-Safety Training | 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. |
| | Designated Team Physician | 3.2.4.16 (Div. I) 3.3.4.17 (Div. II) 3.2.4.18 (Div. III) | A team physician shall be designated for all or each of an institution's intercollegiate teams, and shall be authorized to oversee the medical services for injuries and illnesses incidental to a student-athletes' participation in intercollegiate athletics. |

REGULATIONS INVOLVING HEALTH AND SAFETY ISSUES

| Topic | Issue | NCAA Bylaw Cite | Comments |
|---|--|---|--|
| Student-Athlete Welfare and Safety | Mandatory Medical Examinations | 17.1.5 (Div. I and Div. II), 17.1.6.4 (Div. III) | 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. |
| | Mandatory Medical Examinations | 17.1.5.1 (Div. I), 17.1.5.1(Div. II) | 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. |
| | Confirmation of Sickle Cell Trait Status. | 17.1.6.4.1 (Div. III) | An institution shall confirm the sickle cell trait status of student-athletes, before participation in intercollegiate athletics in one of the following manners: (a) Documentation; (b) Pending Documentation; or (c) Waiver. |
| | Mandatory Sickle Cell Trait Status Education | 17.1.6.4.1.1 (Div. III) | Each student-athlete shall be provided education regarding sickle cell trait status. Student-athletes who have been tested, but do not have confirmed results documented, or have signed a waiver per Bylaw 17.1.6.4.1-(c), shall be provided additional education regarding the risks, impact and precautions associated with sickle cell trait. |
| | 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) | 13.11.3.11 (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; 17.23.7 (Div. I); 17.23.8 (Div. II); 17.25.8 (Div. I and Div. II); 17.26.7 | 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. |

REGULATIONS INVOLVING HEALTH AND SAFETY ISSUES

| Topic | Issue | NCAA Bylaw Cite | Comments |
|---|--|---|---|
| Student-Athlete Welfare and Safety | 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. |
| | On-campus Evaluations – Men’s Basketball | 13.11.2.1 (Div. I) | Under certain circumstances, an institution may conduct an evaluation of a prospect on its campus or at a site it normally uses for practice and competition. |
| | Summer Access – Men’s Basketball | 13.11.3.9 (Div. I); 17.1.6.2.1.1.4 (Div. I) | Under certain circumstances, prospects and student-athletes may engage in required weight-training, conditioning and skill instruction for up to eight weeks in the summer. |

APPENDIX C

INTER-ASSOCIATION CONSENSUS: INDEPENDENT MEDICAL CARE GUIDELINES

September 2014

PURPOSE

The Safety in College Football Summit resulted in inter-association consensus guidelines for three paramount safety issues in collegiate athletics:

1. Independent medical care in the collegiate setting;
2. Concussion diagnosis and management; and
3. Football practice contact.

This document addresses independent medical care for college student-athletes in all sports.

BACKGROUND

Diagnosis, management, and return to play determinations for the college student-athlete are the responsibility of the institution's athletic trainer (working under the supervision of a physician) and the team physician. Even though some have cited a potential tension between health and safety in athletics,^{1,2} collegiate athletics endeavor to conduct programs in a manner designed to address the physical well-being of college student-athletes (i.e., to balance health and performance).^{3,4} In the interest of the health and welfare of collegiate student-athletes, a student-athlete's health care providers must have clear authority for student-athlete care. The foundational approach for independent medical care is to assume an "athlete-centered care" approach, which is similar to the more general "patient-centered care," which refers to the delivery of health care services that are focused only on the individual patient's needs and concerns.⁵ The following 10 guiding principles, listed in the Inter-Association Consensus Statement on Best Practices for Sports Medicine Management for Secondary Schools and Colleges,⁵ are paraphrased below to provide an example of policies that can be adopted that help to assure independent, objective medical care for college student-athletes:

1. The physical and psychosocial welfare of the individual student-athlete should always be the highest priority of the athletic trainer and the team physician.
2. Any program that delivers athletic training services to student-athletes should always have a designated medical director.
3. Sports medicine physicians and athletic trainers should always practice in a manner that integrates the best current research evidence within the preferences and values of each student-athlete.
4. The clinical responsibilities of an athletic trainer

should always be performed in a manner that is consistent with the written or verbal instructions of a physician or standing orders and clinical management protocols that have been approved by a program's designated medical director.

5. Decisions that affect the current or future health status of a student-athlete who has an injury or illness should only be made by a properly credentialed health professional (e.g., a physician or an athletic trainer who has a physician's authorization to make the decision).
6. In every case that a physician has granted an athletic trainer the discretion to make decisions relating to an individual student-athlete's injury management or sports participation status, all aspects of the care process and changes in the student-athlete's disposition should be thoroughly documented.
7. Coaches must not be allowed to impose demands that are inconsistent with guidelines and recommendations established by sports medicine and athletic training professional organizations.
8. An athletic trainer's role delineation and employment status should be determined through a formal administrative role for a physician who provides medical direction.
9. An athletic trainer's professional qualifications and performance evaluations must not be primarily judged by administrative personnel who lack health care expertise, particularly in the context of hiring, promotion, and termination decisions.
10. Member institutions should adopt an administrative structure for delivery of integrated sports medicine and athletic training services to minimize the potential for any conflicts of interest that could adversely affect the health and well-being of student-athletes.

Team physician authority becomes the linchpin for independent medical care of student-athletes. Six pre-eminent sports physicians associations agree with respect to "... athletic trainers and other members of the athletic care network report to the team physician on medical issues."⁶ Consensus aside, a medical-legal authority is a matter of law in 48 states that require athletic trainers to report to a physician in their medical practice. The NCAA Sports Medicine Handbook's Guideline 1B opens with a charge to athletics and institutional leadership to "create an administrative system where athletics health care professionals –

team physicians and athletic trainers – are able to make medical decisions with only the best interests of student-athletes at the forefront.”⁷ Multiple models exist for collegiate sports medicine. Athletic health care professionals commonly work for the athletics department, student health services, private medical practice, or a combination thereof. Irrespective of model, the answer for the college student-athlete is established independence for appointed athletics health care providers.⁸

GUIDELINES

Institutional medical line of authority should be established independently of a coach, and in the sole interest of student-athlete health and welfare. Medical line of authority should be transparent and evident in athletics departments, and organizational structure should establish collaborative interactions with the medical director and primary athletics health care providers (defined as all institutional team physicians and athletic trainers) so that the safety, excellence and wellness of student-athletes are evident in all aspects of athletics and are student-athlete centered.

Institutions should, at a minimum, designate a licensed physician (M.D. or D.O.) to serve as medical director, and that medical director should oversee the medical tasks of all primary athletics health care providers. Institutions should consider a board certified physician, if available. The medical director may also serve as team physician. All athletic trainers should be directed and supervised for medical tasks by a team physician and/or the medical director. The medical director and primary athletics health care providers should be empowered with unchallengeable autonomous authority to determine medical management and return-to-play decisions of student-athletes.

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ENDORSEMENTS

This Consensus Best Practice, Independent Medical Care for College Student-Athletes, has been endorsed by:

- American Academy of Neurology
- American College of Sports Medicine
- American Association of Neurological Surgeons
- American Medical Society for Sports Medicine
- American Osteopathic Academy for Sports Medicine
- College Athletic Trainers' Society
- Congress of Neurological Surgeons
- National Athletic Trainers' Association
- NCAA Concussion Task Force
- Sports Neuropsychological Society

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APPENDIX D

INTER-ASSOCIATION CONSENSUS: YEAR-ROUND FOOTBALL PRACTICE CONTACT GUIDELINES

September 2014

PURPOSE

The Safety in College Football Summit (see appendix) resulted in inter-association consensus guidelines for three paramount safety issues in collegiate athletics:

1. Independent medical care in the collegiate setting;
2. Concussion diagnosis and management; and
3. Football practice contact.

This document addresses year-round football practice contact.

BACKGROUND

Enhancing a culture of safety in collegiate sport is foundational. Football is an aggressive, rugged, contact sport,¹ yet the rules clearly state that there is no place for maneuvers deliberately designed to inflict injury on another player.¹ Historically, rules changes and behavior modification have reduced catastrophic injury and death. Enforcement of these rules is critical for improving player safety.² Despite sound data on reducing catastrophic football injuries, there are limited data that provide a strong foothold for decreasing injury risk by reducing contact in football practice.³⁻⁸ Regardless of such scientific shortcomings, there is a growing consensus that we must analyze existing data in a consensus-based manner to develop guidelines that promote safety. “Safe” football means “good” football.

NCAA regulations currently do not address inseason, full-contact practices. The Ivy League and Pac-12 Conference have limited inseason, full-contact practices to two per week and have established policies for full-contact practices in spring and preseason practices through their Football Practice Standards and Football Practice Policy, respectively. Neither address full-pad practice that does not involve live contact practice, as defined below. Both conferences cite safety concerns as the primary rationale for reducing full-contact practices; neither conference has published or announced data analysis based on their new policies. In keeping with the intent of both conferences and other football organizations, the rationale for defining and reducing live contact practice is to improve safety, including possibly decreasing student-athlete exposure for concussion and sub-concussive impacts. Reduced frequency of live contact practice may also allow even more time for teaching of proper tackling technique.

The biomechanical threshold (acceleration/deceleration/rotation) at which sport-related concussion occurs

is unknown. Likewise, there are no conclusive data for understanding the short- or long-term clinical impact of sub-concussive impacts. However, there are emerging data that football players are more frequently diagnosed with sport-related concussion on days with increased frequency and higher magnitude of head impact (greater than 100g linear acceleration).⁹⁻¹¹

Traditionally, the literature addressing differing levels of contact in football practice correlated with the protective equipment (uniform) worn. This means that full-pad practice correlated with full-contact and both half-pad (shell) and helmet-only practice correlated with less contact. However, coaches, administrators and athletics health care providers who helped to shape these guidelines have noted that contact during football practice is not determined primarily by the uniform, but rather by whether the intent of practice is centered on live contact versus teaching and conditioning. There are limited data that address this issue, and such data do not differentiate whether the intent of the practice is live tackling or teaching/conditioning. Within these limitations, non-published data from a single institution reveal the following:¹⁰

- The total number of non-concussive head impacts sustained in helmets-only and full-pad practices is higher than those sustained in games/scrimmages.
- Mild- and moderate-intensity head impacts occur at an essentially equal rate during full-pad and half-pad practices when the intent of practice is not noted.
- Severe-intensity head impacts are much more likely to occur during a game, followed by full-pad practices and half-pad practices.
- There is a 14-fold increase in concussive impacts in full-pad practices when compared to half-pad or helmets-only practices.
- Offensive linemen and defensive linemen experience more head impacts during both full-pad and half-pad practices relative to all other positions.

The guidelines below are based on: expert consensus from the two day summit referenced above; comments and recommendations from a broad constituency of the organizations listed; and internal NCAA staff members. Importantly, the emphasis is on limiting contact, regardless of whether the student-athlete is in full-pad, half-pad, or is participating in a helmet-only

practice. Equally importantly, the principles of sound and safe conditioning are an essential aspect of all practice and competition exposures.

These guidelines must be differentiated from legislation. For each section below that addresses a particular part of the football calendar, any legislation for that calendar period is referenced. As these guidelines are based on consensus and limited science, they are best viewed as a “living, breathing” document that will be updated, as we have with other health and safety guidelines, based on emerging science or sound observations that result from application of these guidelines. The intent is to reduce injury risk, but we must also be attentive to unintended consequences of shifting a practice paradigm based on consensus. For example, football preseason must prepare the student-athlete for the rigors of an aggressive, contact, rugged sport. Without adequate preparation, which includes live tackling, the student-athlete could be at risk of unforeseen injury during the inseason because of inadequate preparation. We plan to reanalyze these football practice contact guidelines at least annually. Additionally, we recognize that NCAA input for these guidelines came primarily from Division I Football Bowl Subdivision schools. Although we believe the guidelines can also be utilized for football programs in all NCAA divisions, we will be more inclusive in the development of future football contact practice guidelines.

DEFINITIONS

Live contact practice: Any practice that involves live tackling to the ground and/or full-speed blocking. Live contact practice may occur in full-pad or half-pad (also known as “shell,” in which the player wears shoulder pads and shorts, with or without thigh pads). Live contact does not include: (1) “thud” sessions, or (2) drills that involve “wrapping up;” in these scenarios players are not taken to the ground and contact is not aggressive in nature. Live contact practices are to be conducted in a manner consistent with existing rules that prohibit targeting to the head or neck area with the helmet, forearm, elbow, or shoulder, or the initiation of contact with the helmet.

Full-pad practice: Full-pad practice may or may not involve live contact. Full-pad practices that do not involve live contact are intended to provide preparation for a game that is played in a full uniform, with an emphasis on technique and conditioning versus impact.

Legislation versus guidelines: There exists relevant NCAA legislation for the following:

1. Preseason practice
 - a. DI FBS/FCS – NCAA Bylaws 17.9.2.3 and 17.9.2.4
 - b. DII – NCAA Bylaws 17.9.2.2 and 17.9.2.3
 - c. DIII – NCAA Bylaws 17.9.2.2 and 17.9.2.3
2. Inseason practice: No current NCAA legislation addresses contact during inseason practices.
3. Postseason practice: No current NCAA legislation addresses contact during postseason practices.
4. Bowl practice: No current NCAA legislation addresses contact during bowl practice.
5. Spring practice:
 - a. DI FBS/FCS – NCAA Bylaw 17.9.6.4
 - b. DII – NCAA Bylaw 17.9.8
 - c. DIII – NCAA Bylaw 17.9.6 – not referenced to as spring practice, but allows five (5) week period outside playing season.

The guidelines that follow do not represent legislation or rules. As noted in the appendix, the intent of providing consensus guidelines in year one of the inaugural Safety in College Football Summit is to provide consensus-based guidance that will be evaluated “real-time” as a “living and breathing” document that will become solidified over time through evidence-based observations and experience.

Preseason practice guidelines: For days in which institutions schedule a two-a-day practice, live contact practices are only allowed in one practice. A maximum four (4) live contact practices may occur in a given week, and a maximum of 12 total may occur in preseason. Only three practices (scrimmages) would allow for live contact in greater than 50 percent of the practice schedule.

Inseason practice guidelines: Inseason is defined as the period between six (6) days prior to the first regular-season game and the final regular-season game or conference championship game (for participating institutions). There may be no more than two (2) live contact practices per week.

Postseason guidelines: (FCS/DII/DIII) There may be no more than two (2) live contact practices per week.

Bowl practice guidelines: (FBS) There may be no more than two (2) live contact practices per week.

Spring practice guidelines: Of the 15 allowable sessions that may occur during the spring practice season, eight (8) practices may involve live contact; three (3) of these live contact practices may include

greater than 50 percent live contact (scrimmages). Live contact practices are limited to two (2) in a given week and may not occur on consecutive days.

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ENDORSEMENTS

This Inter-Association Consensus: Year-Round Football Practice Contact Guidelines, has been endorsed by:

- American Academy of Neurology
- American College of Sports Medicine
- American Association of Neurological Surgeons
- American Football Coaches Association
- American Medical Society for Sports Medicine
- American Osteopathic Academy for Sports Medicine
- College Athletic Trainers' Society
- Congress of Neurological Surgeons
- Football Championship Subdivision Executive Committee
- National Association of Collegiate Directors of Athletics
- National Athletic Trainers' Association
- National Football Foundation
- NCAA Concussion Task Force
- Sports Neuropsychological Society

APPENDIX E

NCAA INJURY SURVEILLANCE PROGRAM SUMMARY

July 2013

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 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 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.

NCAA INJURY SURVEILLANCE DATA REQUESTS

Research Requests allows researchers and academicians to request data from the NCAA Injury Surveillance Program for research purposes. The NCAA uses the Datalys Injury Statistics Clearinghouse (DISC) to process all requests to sports injury data. Researchers and others can request access to de-identified, line item exposure and injury data from the 2004-09 NCAA Injury Surveillance Program through a two-step process. Completion of appropriate material with initial approval by Datalys Center's Independent Review Committee is the first step. The NCAA will also internally review your application. Applications must have a focused and sound scientific rationale.

Visit Datalys Injury Statistics Clearinghouse (DISC) website at www.disc.datalyscenter.org to view available data and variables and to access the data request form.

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

TWO EASY WAYS TO PARTICIPATE:

The Injury Surveillance Tool (IST). The Injury Surveillance Tool facilitates the work flow 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). The Export Engine Program 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 Injury Surveillance Program is available to the public through an application process administered by the Datalys Center Independent Review Committee located 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 it meets 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.

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: Zach Kerr, Director of the Injury Surveillance System, Datalys Center for Sports Injury Research and Prevention, Indianapolis, Indiana (317/275-3665).

John Parsons, Director, NCAA Sport Science Institute, P.O. Box 6222, Indianapolis, Indiana 46206-6222 (317/917-6456).

Chart 1: Competition and practice injury rates

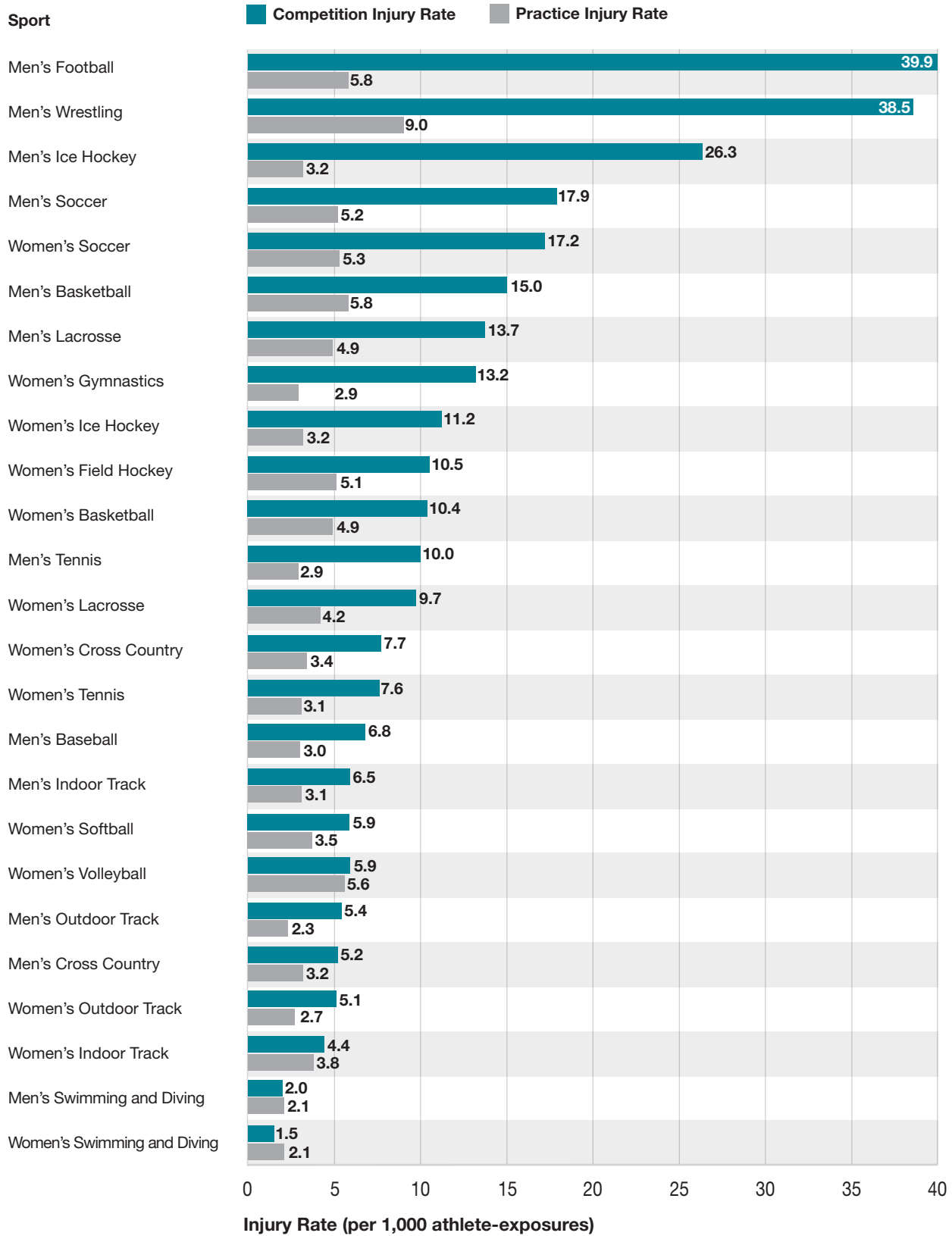
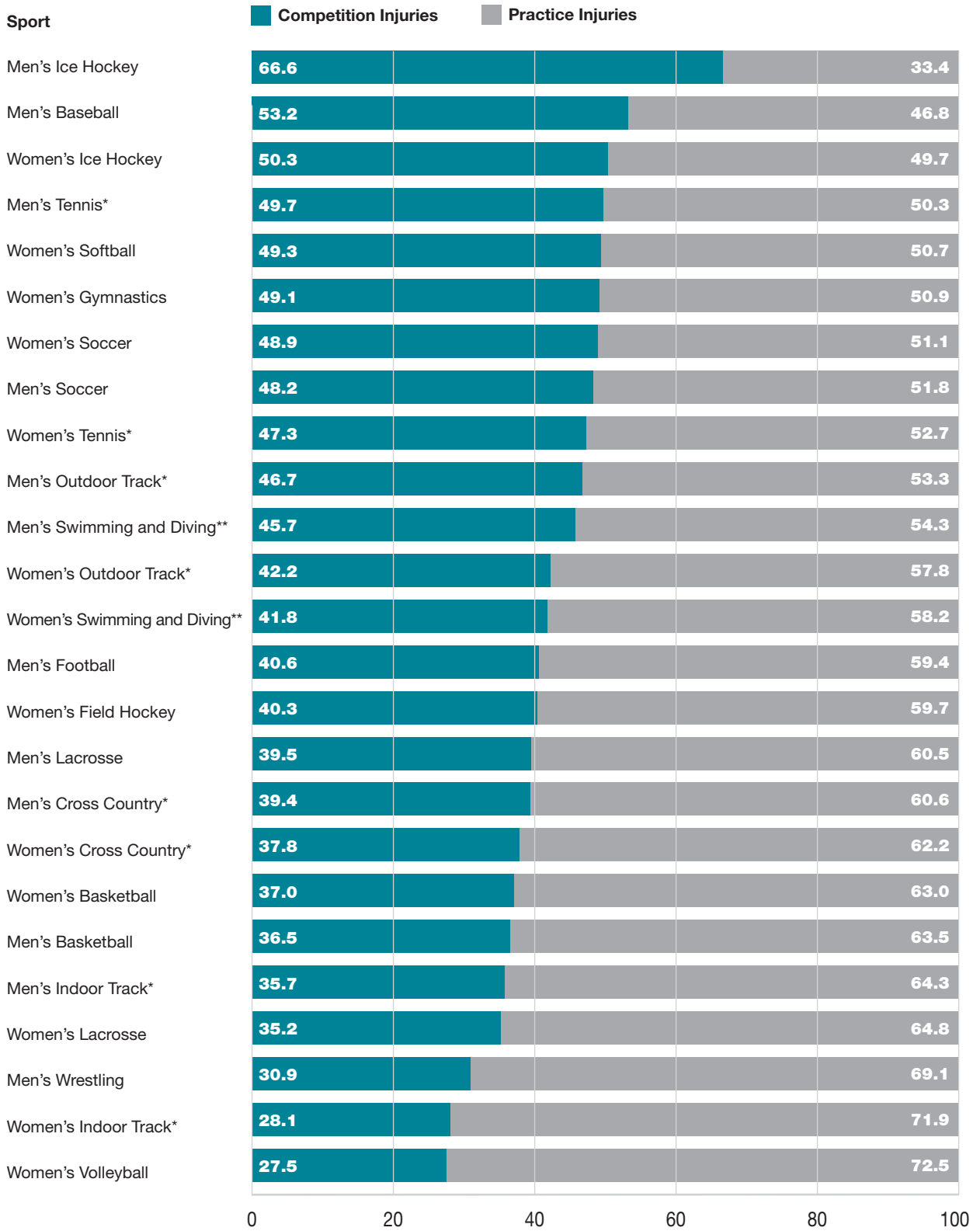


Figure illustrates the average injury rates from 2009-10 to 2013-14 data.

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

Chart 2: Percentage of all injuries occurring in practices and competition



Percentage of all injuries

Figure represents the national estimates of injury percentages for 25 sports from 2009 to 2014 unless otherwise noted below.

* Sports with data from 2005-06 to 2013-14 (9 years).

**Sports with data from 2006-07 to 2013-14 (8 years).

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

APPENDIX F

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- | | | |
|--|---|--|
| John R. Adams <i>Western Athletic Conference</i> | Nicholas J. Cassisi, M.D. <i>University of Florida</i> | Michelle Gober <i>Kutztown University of Pennsylvania</i> |
| Ken Akizuki <i>University of San Francisco</i> | Rita Castagna <i>Assumption College</i> | Gordon L. Graham <i>Minnesota State University, Mankato</i> |
| Jeffrey Anderson <i>University of Connecticut</i> | Charles Cavagnaro <i>University of Memphis</i> | Gary A. Green, M.D. <i>University of California, Los Angeles</i> |
| James R. Andrews, M.D. <i>Troy University</i> | Kathy D. Clark <i>University of Idaho</i> | Letha Griffin, M.D. <i>Georgia State University</i> |
| Elizabeth Arendt, M.D. <i>University of Minnesota, Twin Cities</i> | Kenneth S. Clarke <i>Pennsylvania State University</i> | Eric Hall <i>Elon University</i> |
| William F. Arnet <i>University of Missouri, Columbia</i> | Priscilla M. Clarkson <i>University of Massachusetts, Amherst</i> | Eric Hamilton <i>The College of New Jersey</i> |
| James A. Arnold <i>University of Arkansas, Fayetteville</i> | Bob Colgate <i>National Federation of State High School Associations</i> | Kim Harmon <i>University of Washington</i> |
| Janet Kay Bailey <i>Glenville State College</i> | Donald Cooper, M.D. <i>Oklahoma State University</i> | Richard J. Hazelton <i>Trinity College (Connecticut)</i> |
| Dewayne Barnes <i>Whittier College</i> | Kip Corrington <i>Texas A&M University, College Station</i> | Larry Holstad <i>Winona State University</i> |
| Amy Barr <i>Eastern Illinois University</i> | Lauren Costello, M.D. <i>Princeton University</i> | Maria J. Hutsick <i>Boston University</i> |
| Fred L. Behling <i>Stanford University</i> | Ron Courson <i>University of Georgia</i> | Nell C. Jackson <i>Binghamton University</i> |
| Daphne Benas <i>Yale University</i> | Carmen Cozza <i>Yale University</i> | John K. Johnston <i>Princeton University</i> |
| Brant Berkstresser <i>Harvard University</i> | Scot Dapp <i>Moravian College</i> | Don Kaverman <i>Southeast Missouri State University</i> |
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| Carl S. Blyth <i>University of North Carolina, Chapel Hill</i> | Jerry L. Diehl <i>National Federation of State High School Associations</i> | Fran Koenig <i>Central Michigan University</i> |
| Cindy D. Brauck <i>Missouri Western State University</i> | Randy Eichner <i>University of Oklahoma</i> | Olav B. Kollevoll <i>Lafayette College</i> |
| Donald Bunce, M.D. <i>Stanford University</i> | Brenna Ellis <i>University of Texas at San Antonio</i> | Jerry Koloskie <i>University of Nevada, Las Vegas</i> |
| Elsworth R. Buskirk <i>Pennsylvania State University</i> | Larry Fitzgerald <i>Southern Connecticut State University</i> | Roy F. Kramer <i>Vanderbilt University</i> |
| Peter D. Carlon <i>University of Texas, Arlington</i> | Gregory Frazer <i>Duquesne University</i> | Michael Krauss, M.D. <i>Purdue University</i> |
| Gene A. Carpenter <i>Millersville University of Pennsylvania</i> | Paul W. Gikas, M.D. <i>University of Michigan</i> | Carl F. Krein <i>Central Connecticut State University</i> |
| Frank Carr <i>Earlham College</i> | Pamela Gill-Fisher <i>University of California, Davis</i> | Russell M. Lane, M.D. <i>Amherst College</i> |
| Marino H. Casem <i>Southern University, Baton Rouge</i> | | Melinda Larson <i>Whitworth University</i> |

Kelsey Logan*The Ohio State University***John Lombardo, M.D.***The Ohio State University***Scott Lynch***Pennsylvania State University***William B. Manlove Jr.***Delaware Valley College***Jeff Martinez***University of Redlands***Lois Mattice***California State University, Sacramento***Arnold Mazur, M.D.***Boston College***Chris McGrew, M.D.***University of New Mexico***William D. McHenry***Washington and Lee University***Malcolm C. McInnis Jr.***University of Tennessee, Knoxville***Douglas B. McKeag, M.D.***Michigan State University***Kathleen M. McNally***La Salle University***Robin Meiggs***Humboldt State University***Dale P. Mildenberger***Utah State University***Melinda L. Millard-Stafford***Georgia Institute of Technology***Fred L. Miller***Arizona State University***Matthew Mitten***Marquette University***James Morgan***California State University, Chico***Frederick O. Mueller***University of North Carolina,
Chapel Hill***David M. Nelson***University of Delaware***William E. Newell***Purdue University***Jeffrey O'Connell***University of Virginia***Roderick Paige***Texas Southern University***Joseph V. Paterno***Pennsylvania State University***Marc Paul***University of Nevada, Reno***Daniel Pepicelli***St. John Fisher College***Frank Pettrone, M.D.***George Mason University***Marcus L. Plant***University of Michigan***Sourav Poddar***University of Colorado, Boulder***Nicole Porter***Shippensburg University
of Pennsylvania***Will Prewitt***Great American Conference***James C. Puffer, M.D.***University of California, Los Angeles***Margot Putukian***Princeton University***Ann Quinn-Zobeck***University of Northern Colorado***Tracy Ray***Samford University***Butch Raymond***Northern Sun Intercollegiate Conference***Joy L. Reign***Rowan University***Frank J. Remington***University of Wisconsin, Madison***Rochel Rittgers***Augustana College (Illinois)***Darryl D. Rogers***Southern Connecticut State University***Yvette Rooks***University of Maryland, College Park***Debra Runkle***University of Dubuque***Lori Runksmeier***New England College***Felix Savoie***Tulane University***Richard D. Schindler***National Federation of State
High School Associations***Kathy Schniedwind***Illinois State University***Brian J. Sharkey***University of Montana***Willie G. Shaw***North Carolina Central University***Jen Palancia Shipp***University of North Carolina
at Greensboro***Gary Skrinar***Boston University***Andrew Smith***Canisius College***Bryan W. Smith, M.D.***University of North Carolina, Chapel Hill***Lynn Snyder-Mackler***Lyndon State College***Michael Storey***Bridgewater State University***Grant Teaff***Baylor University***Carol C. Teitz, M.D.***University of Washington***Patricia Thomas***Georgetown University***Susan S. True***National Federation of State
High School Associations***Laurie Turner***University of California, San Diego***Christopher Ummer***Lyndon State College***Jerry Weber***University of Nebraska, Lincoln***Christine Wells***Arizona State University*

Kevin M. White

Tulane University

Robert C. White

Wayne State University (Michigan)

Sue Williams

University of California, Davis

Charlie Wilson

Olivet College

G. Dennis Wilson

Auburn University

Mary Wisniewski

University of Chicago

Glenn Wong

University of Massachusetts, Amherst

Joseph P. Zabilski

Northeastern University

Connee Zotos

Drew University



The NCAA salutes the more than
460,000 student-athletes
participating in **23** sports at more
than **1,100** member institutions