NSCA Strength and Conditioning Professional Standards and Guidelines

ABSTRACT

THIS IS THE UPDATED VERSION OF THE NSCA STRENGTH AND CONDITIONING PROFESSIONAL STANDARDS AND GUIDELINES. THE LAST UPDATE WAS PERFORMED IN 2009.

The Strength and Conditioning profession involves the combined competencies of sport/exercise science, administration, management, teaching, and coaching. Practitioners must also comply with various laws and regulations while responding to instances of potential injury and related claims and suits. This creates remarkable challenges and requires substantial experience, expertise, and other resources to effectively address them, especially in multisport (e.g., collegiate and scholastic) settings.

Ample resources are available in some of these settings but in many others, however, they are not. Budgets, equipment, facilities, and staff are often limited (or lacking altogether), with a resulting mismatch between the participants' demand for safe and effective programs and services, and the institution's provision of them. It is important for Strength and Conditioning practitioners and their employers to understand that this standard of care is a shared duty; the institution and individual are thus jointly responsible for fulfilling it. Collectively, these issues are the driving forces behind this project.

The purpose of the NSCA Strength and Conditioning Professional Standards and Guidelines document is to help identify areas of liability exposure, increase safety, and decrease the likelihood of injuries that might lead to legal claims and suits, and ultimately improve the standard of care being offered. This document is intended to be neither rigid nor static and will be updated periodically to reflect the industry's best practices. It is hoped that Strength and Conditioning practitioners and the institutions employing them will mutually benefit from applying this information, and in turn significantly enhance the quality of services and programs provided to their participants.

NOTICE

This document is intended to provide relevant practice parameters for Strength and Conditioning professionals to use when carrying out their responsibilities in providing services to athletes or other participants. The standards and guidelines presented here are based on published scientific studies, pertinent statements from other associations, analysis of claims and litigation, and a consensus of expert views. However, this information is not a substitute for individualized judgment or independent professional advice.

Neither the NSCA nor the contributors to this project assume any duty owed to third parties by those reading, interpreting, or implementing this information. When rendering services to third parties, these standards and guidelines cannot be adopted for use with all participants without exercising independent judgment and decision-making based on the Strength and Conditioning professional's individual training, education, and experience. Furthermore, Strength and Conditioning practitioners must stay abreast of new developments in the profession so that these standards and guidelines may evolve to meet particular service needs.

Neither the NSCA nor the contributors to this project, by reason of authorship or publication of this document, shall be deemed to be engaged in practice of any branch of professional discipline (e.g., medicine, physical therapy, law) reserved for those licensed under state law. Strength and Conditioning practitioners using

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KEY WORDS:
principles of practice

this information are encouraged to seek and obtain such advice, if needed or desired, from those licensed professionals.

INTRODUCTION

SCOPE OF PRACTICE

The legal responsibilities and professional scope of practice for Strength and Conditioning professionals can be subdivided into 2 domains: (42) "Scientific Foundations" and "Practical/Applied". Each of these involves corresponding activities, responsibilities, and knowledge requirements (refer to Appendices 1 and 2):

Scientific foundations.

- Exercise Sciences (e.g., Anatomy, Exercise Physiology, Biomechanics, Sport Psychology)
- Nutrition

Practical/Applied.

- Exercise Technique
- Program Design
- Organization and Administration
- Testing and Evaluation

LEGAL DUTIES AND CONCEPTS

Strength and Conditioning practitioners have legal duties to provide an appropriate level of supervision and instruction to meet a reasonable standard of care and to provide and maintain a safe environment for the participants under their supervision. These duties also involve informing users of risks inherent in and related to their activities, and preventing unreasonable risk or harm resulting from "negligent instruction or supervision (16,17,21)." Statler and Brown (56) summarize the following key liability concepts for the Strength and Conditioning professional:

- Assumption of risk: voluntary participation in activity with knowledge of the inherent risk(s). Athletic activities, including strength and conditioning, involve certain risks. Participants must be thoroughly informed of the risks of activity, and required to sign a statement to that effect.
- Liability: a legal responsibility, duty, or obligation. Strength and Conditioning professionals have a duty to the participants they serve to take reasonable steps to prevent injury and to act prudently when an injury occurs (5).
- Negligence: failure to act as a reasonable and prudent person would under similar circumstances. Four elements must exist for a Strength and Conditioning professional to be found liable for negligence: duty, breach of duty, proximate cause, and damages (47). Simply stated, a Strength and Conditioning professional is negligent if he/she is proven to have a duty to act and to have failed to act with the appropriate standard of care, proximately causing injury or damages to another person.
- Standard of care: what a prudent and reasonable person would do under similar circumstances. A Strength and Conditioning professional is expected to act according to his/her education, training, and certification status (e.g., CSCS, NSCA-CPT, EMT, cardiopulmonary resuscitation [CPR], automated external defibrillator [AED], First Aid).

Standards versus guidelines. It is important to distinguish between "standards" and "guidelines" because each term has different legal implications (9,60):

- Standard: a required procedure that probably reflects a legal duty or obligation for standard of care (note that the standard statements in this document use the word "must"). The standards set forth in this document may ultimately be recognized as a legal standard of care to be implemented into the daily operations of strength and conditioning programs and facilities.
- Guideline: a recommended operating procedure formulated and developed to further enhance the quality of services provided (note that the guideline statements in this document use the word "should"). Guidelines are not intended to be standards of practice or to give rise to legally defined duties of care, but in certain circumstances they could assist in evaluating and improving services rendered.

While the publication of this document does not amount to a judicial determination of the standard of care to be applied in a particular case, it is presumed that the standards stated herein will likely be given authoritative weight in actual litigations.

Published standards of practice = potential legal duties. Proof of duty or standard of care in a negligence case can be determined in various ways, one of which is from standards of practice published by professional associations and organizations. In actual litigation, published standards of practice can be introduced through expert testimony or in the discovery phase of pretrial to help determine whether a defendant was negligent in carrying out his/her legal duties (9). The current trend in most jurisdictions is to allow such standards as admissible evidence, where they are generally recognized as being indicative of widely accepted practices. Furthermore, courts examining these issues in negligence cases have ruled that violations of such professional standards often constitute a breach of duty.

If properly adopted and applied, published standards of practice can minimize liability exposures associated with negligence, and thereby serve as a potential shield for those who comply with them. They can also be used as a sword against those who do not comply, potentially increasing liability risks associated with negligence (9). The key issue in this regard seems to be the practitioner's consistent application of established standards of practice in the provision of daily service. For example, if his/her conduct is proven to be consistent with accepted standard(s), it will be difficult to show breach of duty, thereby providing protection against negligence. If his/her conduct is not proven to be consistent with accepted standard(s),

however, it may be easier for the injured party to show breach of duty due to failure to follow such standards, which can lead to a ruling of negligence.

TYPES OF STANDARDS

In addition to standards for desired operational practices published by professional organizations such as the NSCA, there are also standards for technical/physical specifications published by independent organizations such as the American Society for Testing and Materials (ASTM) or U.S. Consumer Product Safety Commission (CPSC). These are briefly described below:

Operational practices. In a negligence lawsuit, established standards of care can be used to gauge a practitioner's professional competence by comparing his/her actual conduct with written benchmarks of expected behavior. In addition to the standards and guidelines from allied professional organizations such as the American College of Sports Medicine (ACSM) (3,12,60), American Heart Association (AHA) (3,35,36), and National Athletic Trainers' Association (NATA) (39) referenced in this document, the following associations have also published standards of practice:

- Aerobics and Fitness Association of America. Exercise Standards and Guidelines (4th ed). Ventura, CA: AFAA, 2002.
- American Academy of Pediatrics. Strength training by children and adolescents. Pediatrics 121: 835–840, 2008. Available at: http://pediatrics.aappublications.org/content/121/4/835. Accessed 11/5/2017.
- American Physical Therapy Association. Guide to Physical Therapist Practice (2nd ed). Alexandria, VA: APTA, 2003.
- National Association for Sport and Physical Education. Moving Into the Future: National Standards for Physical Education (2nd edition). Reston, VA: NASPE, 2004.
- National Athletic Trainers' Association Board of Certification. Standards of Professional Practice. Dallas, TX: NATA, 2016. Available at: http://www.bocatc.org/public-protection#standards-discipline Accessed 11/5/2017.
- President's Council on Fitness, Sports and Nutrition. The Role of Resistance Training for Children and Adolescents. Available at: http://www.fitness.gov/blog-posts/role_resistance_training.html. Accessed 11/5/2017.
- Society of Health and Physical Educators. Quality Coaches, Quality Sports: National Standards for Sport Coaches (2nd ed). Champaign, IL: Human Kinetics, 2006.
- US Center for SafeSport. Available at: https://safesport.org/ Accessed 11/5/2017.

Technical and physical specifications. Technical and physical specifications of equipment and facilities relevant to the Strength and Conditioning profession have been published by the ASTM and CPSC. The CPSC also operates the National Electronic Injury Surveillance System (NEISS), a surveillance and follow-back system that gathers data from hospital emergency departments to provide timely information on consumer injuries associated with certain products or activities. Some of these data have been used to research weight training injuries, as will be addressed in the Injury Trends, Litigations, and Standard of Care Load section.

STANDARDS OF PRACTICE AS THEY APPLY TO RISK MANAGEMENT

Risk management is a proactive administrative process that helps minimize legal liability, as well as decrease the frequency and severity of injuries and subsequent claims and lawsuits (8). It may not be possible to eliminate all risks of injury and liability exposure in strength and conditioning settings; however, it can be effectively minimized and mitigated by implementing sound risk management strategies. The Strength and Conditioning practitioner is ultimately responsible for risk management, but all facility staff should be involved in the various aspects of the process. Eickhoff-Shemek (10) proposes a 4-step procedure for applying standards of practice to the risk management process:

1. *Identify and select standards of practice, as well as all applicable laws.* Because so many standards of practice are published by various organizations, it is challenging for the Strength and Conditioning professional to be aware of all of them, and determine which ones are appropriate when implementing the risk management plan. In terms of participant safety, the most conservative or stringent standards in a given industry should generally be used.
2. *Develop risk management strategies reflecting standards of practice and all applicable laws.* This step involves writing procedures describing specific responsibilities and/or duties that staff would carry out in particular situations. The procedures should be written clearly, succinctly, and without excessive detail (too much detail may not allow the flexibility practitioners need in particular situations and make implementation of those strategies difficult or impractical). Once the written procedures are finalized, they should be included in the staff policies and procedures manual.
3. *Implement the risk management plan.* Implementation of the risk management plan primarily involves staff training to ensure that the practitioner's daily conduct will be consistent with written policies and procedures and selected laws and standards of practice. The policies and procedures manual should be used in conjunction with the initial training of new employees, as well as during regular in-service training, where all employees practice a particular (e.g., emergency) procedure. From a legal perspective, it is also important to explain to staff why it is essential to carry out such duties appropriately.
4. *Evaluate the risk management plan.* Like the law, standards of practice are not static and need to be updated periodically to reflect change. The risk management plan should

be formally evaluated at least annually, as well as after each incidence of accident or injury to determine whether emergency procedures were performed correctly and what could be done to prevent a similar incident in the future.

LIABILITY EXPOSURE IN THE STRENGTH AND CONDITIONING PROFESSION

While each strength and conditioning program and facility is unique, the NSCA Professional Standards and Guidelines Task Force has identified 9 areas of potential liability exposure, as delineated below. It is important to note that they are interrelated. For example, proper instruction and supervision is associated with personnel qualifications, as well as facility layout and scheduling issues. Noncompliance in any area can therefore affect others, and in turn compound the risk of liability exposure and potential litigation. Furthermore, the Strength and Conditioning practitioner and his/her employer share the corresponding duties and responsibilities.

Collectively within these liability exposure areas, 11 standards and 14 guidelines for Strength and Conditioning practitioners have further been identified (these are presented in the next section of this document). These standards and guidelines are intended to serve as an authoritative and unbiased source for professional guidance. The rationale for each is summarized below.

Preparticipation screening and clearance. A physical examination is imperative for all participants before participating in a strength and conditioning program and should be performed by a properly qualified health care provider with the requisite training, medical skills, and background to reliably perform a physical examination. This should include a comprehensive health and immunization history (as defined by current guidelines from the Centers for Disease Control and Prevention (CDC)), as well as a relevant physical examination, part of which includes an orthopedic evaluation. Some type of cardiovascular screening, as discussed below, is also recommended. The Strength and Conditioning staff should receive documentation about any condition that would potentially require special training considerations (e.g., sickle-cell disease), even if the participant has been given medical clearance to participate. Participants who are returning from an injury or illness must also be required to provide documentation of medical clearance before returning to a strength and conditioning program. Therefore, communication between the Sports Medicine/Athletic Training staff and the Strength and Conditioning staff must be clear and timely.

Currently, there are no universally accepted standards for screening participants nor are there approved certification procedures for health care professionals who perform such examinations. However, a joint Pre-Participation Physical Evaluation Task Force of 6 organizations (American Academy of Family Physicians, American Academy of Pediatrics, American College of Sports Medicine, American Medical Society for Sports Medicine, American Orthopaedic Society for Sports Medicine, and American Osteopathic Academy of Sports Medicine) has published a widely accepted monograph including detailed instructions on performing a preparticipation history and physical examination, determining clearance for participation, and a medical evaluation form to copy and use for each examination (46). In addition, the American Heart Association and American College of Sports Medicine have published statements on preparticipation screening for those involved in fitness-related activities (3,35,36). Relevant points are summarized as follows:

- *Educational institutions have an ethical, medical, and possible legal obligation to implement cost-efficient preparticipation screening strategies (including a complete medical history and physical examination), and thereby ensure that high school and college athletes are not subject to unacceptable risks.* Support for such efforts, especially in large athletic populations, is mitigated by cost-efficiency considerations, practical limitations, and an awareness that it is not possible to achieve zero risk in competitive sports.
- *Preparticipation athletic screening should be performed by a properly qualified health care provider with the requisite training, medical skills, and background to reliably perform a physical examination, obtain a detailed cardiovascular history, and recognize heart disease.* A licensed physician is preferred, but an appropriately trained registered nurse or physician assistant may be acceptable under certain circumstances in states where nonphysician health care workers are permitted to perform preparticipation screening. In the latter situation, however, a formal certification process should be established to demonstrate expertise in performing cardiovascular examinations.
- *A complete and careful personal and family medical history and physical examination designed to identify (or raise suspicion of) cardiovascular risk factors known to cause sudden death or disease progression is the best available and most practical approach to screening populations of competitive sports participants.* Such screening is an obtainable objective, and should be mandatory for all participants. Initially a complete medical history and physical examination should be performed before participation in organized high school athletics (grades 9–12). An interim history should be obtained in intervening years. For collegiate athletes, a comprehensive personal/family history and physical examination should be performed by a qualified examiner initially on entering the institution, before beginning training and competition. Screening should be repeated every 2 years thereafter unless more frequent examinations are indicated; and an interim history and blood pressure measurement should be obtained each subsequent year to

determine whether another physical examination, and possible further testing, is required (e.g., due to abnormalities or changes in medical status).

- *Health appraisal questionnaires should be used before exercise testing and/or training to initially classify participants by risk for triage and preliminary decision-making.* After the initial health appraisal (and medical consultation and/or supervised exercise test, if indicated), participants can be further classified for exercise training on the basis of individual characteristics. When a medical evaluation/recommendation is advised or required, written and active communication between facility staff and the participant's personal physician or health care provider is strongly recommended. Furthermore, participants should be educated about the importance of obtaining a preparticipation health appraisal and medical evaluation/recommendation (if indicated), as well as the potential risks incurred without obtaining them.

Personnel qualifications. Qualified and knowledgeable personnel must be hired to properly supervise and instruct participants using Strength and Conditioning facilities and equipment. A three-pronged approach is recommended.

First, the Strength and Conditioning practitioner should acquire expertise, and have a degree from an accredited college/university in one or more of the topics comprising the "Scientific Foundations" domain identified in the Certified Strength and Conditioning Specialist (CSCS) Examination Content Description (42) (i.e., anatomy, exercise/sport physiology, biomechanics, sport psychology, nutrition; see Appendix 1), or in a related subject (e.g., exercise/sport pedagogy, psychology, motor learning, training methodology, kinesiology). Note that the NSCA's Education Recognition Program (ERP) has been developed to recognize institutions of higher learning that meet such requirements, and also helps to identify an educational career path for the Strength and Conditioning profession. Likewise, practitioners should make an ongoing effort to acquire knowledge and competence in the content areas outside their primary area of expertise. In 2004, the Commission on Accreditation of Allied Health Education Programs (CAAHEP) began accrediting programs in exercise science and exercise physiology (https://www.caahep.org/ Accessed 11/5/2017), so if the practitioner is unable to attend an NSCA-ERP institution, training in an accredited program in exercise science or exercise physiology will ensure that the "Scientific Foundations" are thoroughly covered.

High school settings are unique in that most teaching positions require a teacher certification from an accredited program, typically in Physical Education, for an individual who will be working with students in an athletic setting. The Society of Health and Physical Educators (SHAPE), formerly known as AAHPERD, has also created national standards and guidelines for physical education teacher education that address the unique issues pertinent to exercise and sport in the high school environment (https://www.shapeamerica.org/ Accessed 11/5/2017).

Second, accredited certifications offered through professional organizations with continuing education requirements and a code of ethics (e.g., the CSCS credential; see Appendix 2) are available to Strength and Conditioning practitioners interested in acquiring the necessary competencies. Depending on the practitioner's specific duties, responsibilities, and interests, relevant certifications offered by other governing bodies may also be appropriate, depending on the requirements for obtaining and maintaining certification.

Third, a Strength and Conditioning practitioner's knowledge and skill development can be enhanced by applying the "performance team" concept (i.e., aligning a staff comprised of qualified professionals with interdependent expertise and shared leadership roles; see Appendix 3) (27,28). The scope of practice for the Strength and Conditioning profession has expanded and diversified to the point where it is very challenging, and often unrealistic, for each individual to acquire proficiency in all areas. Therefore, specific roles and responsibilities must be outlined and understood by all members of the Strength and Conditioning staff and matched with each person's training and experience. The productivity of a hierarchical (single-leader) work group can be significantly improved by applying the team model to staffing; the same team dynamics that augment the group's effectiveness also tend to enhance individual members' learning and skill acquisition (27).

Program supervision and instruction. Although serious accidents are rare in supervised exercise programs, the liability costs associated with inadequate or lax supervision are very expensive, and the plaintiff's recovery rate in such negligence lawsuits can be high. The main causes of these incidents are poor facility maintenance, defective equipment, and inadequate instruction or supervision. The importance of staffing is readily apparent in each circumstance. For example, Rabinoff (48) reviewed 32 litigations arising from negligent weight training supervision and found that 3 issues were raised by the plaintiff's attorneys in each case: poor instruction (or instructor qualifications); lax/poor supervision; and failure to warn of inherent dangers (in the equipment, facility, or exercise). The standard of care used in each case was based on statements established by the NSCA, ACSM, or SHAPE. A prevalent trend in such litigations is the issue of "professional instructor qualifications," such as appropriate degrees, recognized certifications, training, experience, and continuing education (refer to guideline 2, and Appendices 1 and 2).

Participants in a Strength and Conditioning facility must be properly

supervised and instructed at all times to ensure maximum safety, especially because of the athletic, skillful nature of many activities implemented in strength and conditioning programs, in accordance with the dynamic correspondence (54) and practice specificity (49,50) principles. Bucher and Krotee (5) recommend the following cardinal principles of supervision:

- Always be there (mentally and physically).
- Be active and hands-on.
- Be prudent, careful, and prepared (e.g., knowledgeable of proper technique/spotting, program design).
- Be qualified (e.g., accredited degree, CSCS/NSCA-CPT, CPR/AED, First Aid).
- Be vigilant.
- Inform participants of safety and emergency procedures.
- Know participants' health status.
- Monitor and enforce rules and regulations.
- Monitor and scrutinize the environment.

In addition to the physical and mental presence of qualified professionals during strength and conditioning activities, effective instruction and supervision involves a range of practical considerations (2,4,19,21,23,56,59):

- A clear view of all areas of the facility, or at least the zone being supervised by each practitioner and the participants in it. This issue is related to facility design and layout, encompassing equipment placement with respect to visibility, versatility, and accessibility. (refer to standard 4)
- The practitioner's proximity to the group of participants under his/her supervision. This includes the ability to see and communicate clearly with one another, and quick access to participants in need of immediate assistance or spotting.
- The number and grouping of participants to make optimal use of available equipment, space, and time.
- The participants' age(s), experience level(s), and need(s).
- The type of program being conducted (e.g., skillful/explosive free-weight movements versus machine or guided-resistance exercises) and the corresponding need for coaching and spotting.

In an ideal world, strength and conditioning activities should be scheduled to distribute activity throughout the day, and thereby promote an optimal training environment (refer to Appendix 4 for basic guidelines on calculating space needs). Even with careful planning, however, most facilities have times of peak usage (e.g., as a result of team practices and participants' class schedules). Beyond a certain point, it is impractical to simply spread strength and conditioning activities over a wider range of times to maintain an acceptable professional-to-participant ratio. The central issue is to accommodate peak usage times by providing adequate facilities and qualified staff, such that all participants are properly instructed and supervised (refer to guideline 2) (23,31,60). Furthermore, proper techniques, movement mechanics, and safety should be emphasized to minimize injury risk and liability exposure (7,14,25) (also see the NSCA position statements summarized in Appendix 5). Likewise, instructional methods, procedures, and progressions that are consistent with accepted professional practices should be used (45,49,50,54,57,58).

While reasonable steps should be taken to make optimal use of the Strength and Conditioning facility and staff, a potential mismatch between available resources and demand for programs and services exists in many institutions during times of peak usage. As explained below in the Injury Trends, Litigations, and Standard of Care Load section, the combined effects of exponential growth in collegiate/scholastic athlete participation, corresponding liability exposures, and equal opportunity/access laws create a remarkable standard of care load and liability challenge for Strength and Conditioning practitioners and their employers. A 2-pronged approach can thus be recommended.

First, strength and conditioning activities should be planned, and the required number of qualified staff should be present, such that recommended guidelines for minimum average floor space allowance per participant (100 ft^2), minimum professional-to-participant ratios (1:10 junior high school, 1:15 high school, 1:20 college), and number of participants per barbell or training station (up to 3) are applied during peak usage times (2,23,56). In general circumstances, this corresponds to 1 Strength and Conditioning practitioner per 3–4 training stations and/or 1,000 ft^2 area (junior high school); 5 training stations and/or 1,500 ft^2 area (high school); or 6–7 training stations and/or 2,000 ft^2 area (college), respectively. It is extremely important to note that these ratios do not take into account the use of complex lifts such as the weightlifting movements and their derivations, or the use of the primary structural (multijoint) free-weight exercises. Therefore, a much smaller supervision ratio is warranted in these circumstances (e.g., 1:12 instead of 1:20 for college-level). In addition, there are no data regarding how the ratios should differ with training status. Therefore, professional discretion should be used to adjust these guidelines with respect to the practical considerations discussed above.

Second, Strength and Conditioning practitioners and their employers should work together toward a long-term (e.g., 3–5 years) goal of matching the professional-to-participant ratio in the Strength and Conditioning facility to each sport's respective coach-to-athlete ratio. This is relatively straightforward in collegiate settings where the NCAA limits the number of coaches per sport in Division I (NCAA Division I Manual, Bylaw 11.7; updated annually) and also provides sports participation data (refer to Appendix 6; note that coach-to-athlete ratios for individual-event sports are lower than those for team sports) (40). In the absence of similar information in other (e.g., scholastic) settings, such determinations can be made on an individual institution basis; or possibly according

to trends within a district, division, or state.

Facility and equipment set-up, inspection, maintenance, repair, and signage. In some cases, Strength and Conditioning professionals are involved in all phases of facility design and layout. Perhaps more commonly, however, they assume responsibility for an existing facility, in which case the opportunities to plan or modify it may be limited. In either case, the Strength and Conditioning practitioner and his/her employer are jointly responsible for maximizing the safety, effectiveness, and efficiency of the facility, such that the allotted space and time can be put to optimal use (24) (also see Appendix 4).

The Strength and Conditioning professional should establish written policies and procedures for equipment/facility selection, purchase, installation, set-up, inspection, cleaning, maintenance, and repair. Safety audits and periodic inspections of equipment, maintenance, repair, and status reports should all be included. Manufacturer-provided user manuals, warranties, and operating guides, and other relevant records (e.g., pertaining to equipment selection, purchase, installation, set-up, inspection, cleaning, maintenance and repair; refer to guideline 6), should be kept on file and followed regarding equipment operation and maintenance (5).

The Strength and Conditioning professional should understand the concept of "product liability," which refers to the legal responsibilities of a product manufacturer and/or vendor if a person sustains injury or damage due primarily to a defect or deficiency in design or manufacturing (56). While this issue applies to manufacturers and vendors, there are actions and/or behaviors that can increase the Strength and Conditioning professional's responsibility, consequently putting him/her at risk for claims or suits (16). The following steps should be taken to minimize liability exposures caused by strength and conditioning equipment (5,11,30):

- Buy the equipment exclusively from reputable manufacturers, and be certain that it meets existing standards and guidelines for professional/commercial (not home) use.
- Use the equipment only for the purpose intended by the manufacturer; do not modify it from the condition in which it was originally sold unless such adaptations are clearly designated and instructions for doing so are included in the product information.
- Post any signage provided by the manufacturer on (or in close proximity to) the equipment.
- Do not allow unsupervised participants to use the equipment.
- Regularly inspect the equipment for damage and wear that may place participants at risk for injury.

Emergency planning and response. An emergency response plan is a written document that details the proper procedures for caring for participants who incur injuries during activity as well as lightning safety (refer to Appendix 7 for sample guidelines). While all Strength and Conditioning facilities should have such a document, it is important to appreciate that the document itself does not save lives. Indeed, it may offer a false sense of security if it is not backed up with appropriate training and preparedness by qualified, professional staff. Therefore, all personnel in Strength and Conditioning facilities must:

- Know the emergency response plan and the proper procedures for dealing with an emergency (e.g., location of phones, activating emergency medical services, designated personnel to care for injured participants, ambulance access, and location of emergency supplies).
- Review and practice emergency policies and procedures regularly (e.g., at least quarterly).
- Maintain current certification in guidelines for cardiopulmonary resuscitation and automated external defibrillators (CPR-AED) as established by the American Heart Association and International Liaison Committee on Resuscitation (1). Several organizations, such as the American Heart Association, Red Cross, National Safety Council, and St. John Ambulance, offer acceptable certifications. First Aid training and certification may also be necessary if Sports Medicine personnel such as an MD, PA, or ATC are not immediately available.
- Adhere to universal precautions for preventing exposure to and transmission of bloodborne pathogens, as established by the CDC (51), Occupational Safety and Health Administration (OSHA) (43), and the NCAA Sports Medicine Handbook (44). Bloodborne and Airborne Pathogens Training by the National Safety Council may be necessary if personnel are not immediately available to properly respond to exposure to blood or other potentially infectious materials.

Records and record keeping. Documentation is fundamental to the management of strength and conditioning programs and facilities. In addition to developing and maintaining a policies and procedures manual (56), a variety of records should be kept on file (5):

- Personnel credentials
- Professional standards and guidelines
- Policies and procedures for operation and safety, including a written emergency response plan (refer to standard 5; Appendix 7)
- Manufacturer-provided user's manuals, warranties, and operating guides; and equipment selection, purchase, installation, set-up, inspection, cleaning, maintenance, and repair records
- Injury/incident reports, preparticipation medical clearance, and return to participation clearance documents (after the occurrence of an injury, illness, change in health status or an extended period of absence) for each participant under their supervision
- In collegiate and scholastic settings, athletes are required to sign

protective legal documents (e.g., informed consent, agreement to participate, waiver, personal contract; refer to Appendix 8) covering all athletically related activities, including strength and conditioning; however, in other settings, the Strength and Conditioning professional should consider having participants sign such legal documents
- Training logs, progress entries and/or activity instruction/supervision notes

Legal and medical records should be kept on file as long as possible in the event of an injury claim or suit. Statutes of limitations (i.e., the time in which individuals may file a lawsuit) vary from state to state, so it is good practice to maintain files indefinitely or consult with a legal authority (22). All records should be kept as securely as possible, with limited access by anyone not on staff. Examples of securing records include locked filing cabinets and password-protected computers and computer files. As is the case with other organizational and administrative tasks, it is necessary to have adequately and appropriately trained staff to properly keep and maintain such records.

Equal opportunity and access. Federal, state, and possibly local laws and regulations prohibit discrimination or unequal treatment (e.g., according to race, color, national origin, religion, sex, gender identity and expression, political affiliation, age, disability, veteran status, genetic information, or sexual orientation or other such legal classifications) in most organizations, institutions, and professions. For example, practitioners employed in federally funded educational (i.e., collegiate or scholastic) settings must comply with civil rights statutes including Title IX of the Education Amendments of 1972, which mandates gender equity in providing opportunity and access to athletic facilities, programs, and services. The Strength and Conditioning professional must obey the letter and spirit of these laws when working with participants as well as with staff. If a Strength and Conditioning professional witnesses any discriminatory or unequal treatment of individuals or teams while performing duties in the scope of employment, the illegal conduct must be immediately reported to a supervisor, compliance department, and/or the general counsel for the employment entity. To protect the interests of the Strength and Conditioning professional, it is also recommended to consult with a private legal entity when the foregoing situation is encountered.

Participation in strength and conditioning activities by children. Resistance training can be an important component of youth fitness, health promotion, and injury prevention. Such programs are safe when properly designed and supervised, and can increase children's strength, motor fitness skills, sports performance, psychosocial well-being, and overall health (12,32,33). Indeed, many of the benefits associated with adult strength and conditioning activities are attainable by prepubescent and adolescent participants who participate in age-specific training (12,32,33). However, it is important for the Strength and Conditioning practitioner to take certain precautions with children (13).

In a 20-year retrospective review of weight training injuries that were evaluated and/or treated in U.S. hospital emergency departments (based on NEISS data), Jones (26) found an alarming incidence of injuries to young children. Children <7 years of age are almost 6 times more likely to be injured than those >15 years of age, with the majority (80%) resulting from playing with or around weight training equipment in the home. The CPSC estimated in 2015 that approximately 8,850 children younger than 5 years are injured each year with exercise equipment (e.g., include stationary bicycles, treadmills, and stair climbers), with an additional 45,725 injuries per year to children 5–14 years of age (https://origin.prod.cpsc.gov/s3fs-public/2015%20Neiss%20data%20highlights.pdf Accessed 11/5/2017). This has clear implications regarding the importance of supervising children in these age groups, and their exposure to such equipment or facilities. In support of this, Malina (34) reported that estimated injury rates in resistance training programs were 0.176, 0.053, and 0.055 per 100 participant-hours in pre- and early-pubertal youth, respectively, in the programs examined. Twenty-two studies were examined and all used high levels of supervision and low instructor to participant ratios, which was believed to be the reason for the extremely low injury rates.

Another area of potential injury concern for children and pubescents/adolescents is the use of maximum (max) testing (one repitition maximum [1RM]). While Faigenbaum and others (12,13,32,33) have shown max testing to be safe in these age groups, it is emphasized that maintaining proper technique is critical. As an alternative, simple field-based measures such as vertical jump, long jump, and handgrip strength, which have been correlated to 1RM strength may be used (32). Attention to NSCA-prescribed guidelines (7,14,25) for lifting technique should always be followed.

Supplements, ergogenic aids and drugs. The issue of using ergogenic aids, including nutritional supplements and drugs, is complicated by several factors. First, dietary supplements are regulated as foods rather than drugs according to the Dietary Supplement Health and Education Act of 1994. Consequently, concerns exist regarding quality control/assurance and possible consequences for consumers can exist. Strength and Conditioning practitioners are often approached for advice on nutrition and supplementation but may be limited through state laws in what advice can be administered. Spano (55) outlines the roles and responsibilities of the Sport Nutritionist and other professionals who may give nutrition advice. However, the Strength and Conditioning practitioner should be aware of the following:

- The Federal Trade Commission has primary responsibility for advertising claims. Simply stated, advertising for any product, including dietary supplements, must be truthful, substantiated, and not misleading.
- The U.S. Food and Drug Administration has primary responsibility for product labeling claims. The legislation enforced by this agency includes current good manufacturing practice regulations and selected portions of the Federal Food, Drug and Cosmetic Act related to dietary supplements. Note that the U.S. Pharmacopeia and National Formulary, which establishes manufacturing practices for nutritional supplements (i.e., standards for identity, strength, quality, purity, packaging, labeling, and storage), is cited as a primary resource in this legislation.

A second complicating factor is that the boundaries between dietary supplements, drugs, and conventional foods are unclear. This is especially problematic for competitive athletes and coaches, because such products may contain substances that are banned by 1 or more sport governing bodies despite the manufacturer's or vendor's use of terms such as "herbal", "legal", "natural", "organic", "safe and effective", etc. Furthermore, supplement manufacturers are constantly developing new products with different combinations of ingredients, making it more challenging to identify those that may be problematic.

A third factor is that banned substance policies and procedures, testing protocols, and related rules and regulations differ among sport governing bodies at all levels (e.g., USOC, MLB, NBA, NFL, NHL, NCAA, NAIA, NFHS). Therefore, a compound that is permissible according to 1 governing body may be impermissible according to another. The US Anti-Doping Agency (USADA; https://www.usada.org/about/ Accessed 11/5/2017) and the World Anti-Doping Agency (WADA; https://www.wada-ama.org/ Accessed 11/5/2017) have many resources including lists, handbooks, overviews, guides, and FAQ web pages to assist coaches and athletes in ensuring they are avoiding all banned substances, in addition to those provided by a specific sport governing body.

The National Federation of State High School Associations' Sports Medicine Advisory Committee is opposed to the use of dietary supplements to obtain a competitive advantage and has created a position statement to that effect (http://www.nfhs.org/media/1015652/dietary-supplements-position-statement-2015.pdf Accessed 11/5/2017). Furthermore, Strength and Conditioning practitioners at NCAA member institutions need to be aware of NCAA Division I Bylaw 16.5.2.g: "An institution may provide permissible nutritional supplements to a student-athlete for the purpose of providing additional calories and electrolytes. Permissible nutritional supplements do not contain any NCAA banned substances and are identified according to the following classes: carbohydrate/electrolyte drinks, energy bars, carbohydrate boosters, and vitamins and minerals." The NCAA Committee on Competitive Safeguards and Medical Aspects of Sports has subsequently developed lists of permissible versus nonpermissible nutritional supplements, although these will probably change as the market continues to evolve and new products are evaluated.

INJURY TRENDS, LITIGATIONS, AND STANDARD OF CARE LOAD: EFFECTS OF RISING ATHLETIC PARTICIPATION

The lack of qualified instruction and supervision can be identified, either directly or indirectly, as a causative factor in the available information on injuries and litigations associated with weight training. In some cases, this is clearly documented (26,29), while in others it can be inferred. For example, the relatively high coach-to-athlete ratio (and corresponding standard of care) in Olympic-style weightlifting is a likely reason for the low incidence of injury in this sport despite its technical and athletic nature (18,29). Based on the collective information summarized below, it is difficult to overemphasize the fundamental importance of qualified staffing in fulfilling the institution's and Strength and Conditioning professional's shared legal duties for safety, supervision, and standard of care.

Collegiate settings. Year-round strength and conditioning activities are now the rule rather than the exception in collegiate athletic programs. According to NCAA data on student-athlete participation (40), the overall number of participants increased 108% (from 231,445 to 482,533) between 1981–82 and 2014–15. Of special interest are the changes in female participation during this period. The increase in women's participation was 186% (from 74,239 to 212,474) as compared with 63% for men (from 169,800 to 276,599).

The total number of, and time of participation in, athletically related activities has also expanded accordingly. While desirable in terms of preparation, the allowance of nontraditional seasons, off-season skill instruction, and year-round strength and conditioning activities increases each student-athlete's potential for injury and liability exposure, as well as the corresponding standard of care load placed on support staff. The NATA recently published a detailed overview of injury incidence in collegiate athletics, and found that it has risen sharply and consistently with the increase in participants and exposures (39). The potential liability issues for Strength and Conditioning professionals and their employers are further compounded by the exponential rise in female participation and laws mandating equal opportunity and access to athletic programs, services, and facilities (refer to standard 7).

Scholastic settings. The sheer number of high school athletes, and growing emphasis on year-round strength and conditioning activities in scholastic settings, presents a tremendous challenge in terms of demand for standard of care, and accompanying liability exposure. Student-athlete participation in

organized high school sports increased 100% (from approximately 4 million to approximately 8 million) between 1971 and 2016 (41). Of special interest are the changes in female participation during this period. The relative increase in girls' participation was 1,000% (from about 0.3 million to 3.3 million) as compared with 24% for boys (from approximately 3.7 million to 4.5 million).

As is the case in collegiate settings, the combination of increasing participation in athletic activities, a corresponding rise in liability exposures, and laws mandating equal opportunity and access creates a remarkable standard of care load and challenge in terms of legal duties for Strength and Conditioning practitioners and their employers (refer to standard 7).

Other populations. Studies examining the incidence and types of weight training injury report varying injury rates, but similar distributions of injury types. Weight training injuries seem to be associated with various training methods (e.g., bodybuilding, powerlifting, Olympic-style weightlifting, fitness/recreational weight training) and equipment (e.g., free weights, machines). Of these, explosive types of training and free-weight apparatus are often incorrectly believed to be inherently more dangerous than other methods. In some of the earliest investigations, Hamill (18) conducted a survey of sport injury rates in 13–16-year-old school children and found that the injury rate in Olympic-style weightlifting (0.0017 per 100 hours) is even lower than that for weight training (0.0035 per 100 hours) and that each of these injury rates were much lower than those observed for other, more popular sports (e.g., basketball 0.03; football 0.10; gymnastics 0.044; athletics 0.57). Calhoon and Fry (6) analyzed weightlifting injury reports at the U.S. Olympic Training Centers over a 6-year period and found that elite weightlifters' injuries were strains, tendinitis, or sprains typical of acute (59.6%) or chronic (30.4%) overuse or inflammation. Injury rates were calculated to be 0.33 per 100 hours of weightlifting exposure, and the recommended number of training days missed for most (90.5%) injuries was 1 day. These authors concluded that weightlifting injury patterns and rates are similar to those reported for other sports and activities. More recently, Keogh and Winwood (29) compiled data from several investigations and found that bodybuilding had the lowest injury rates (0.024 injuries per 100 hours), with strongman (0.53 injuries per 100 hours) and Highland Games (0.75 injuries per 100 hours) reporting the highest rates. The shoulder, lower back, knee, elbow, and wrist/hand were generally the most commonly injured anatomical locations; strains, tendinitis, and sprains were the most common injury type (29,38). Very few significant differences in any of the injury outcomes were observed as a function of age, sex, competitive standard, or bodyweight class, although Myer (38) found a higher incidence of "accidental" injuries in youth versus adults.

Although risk-factor studies of acute weight training injuries are lacking, recognized contributing factors include poor technique, lack of supervision, skeletal immaturity, and steroid abuse (37). Some of these factors are confirmed in the NSCA (33) and ACSM (12) published statements on youth resistance training. Chronic weight training injuries, however, have been attributed to excessive weight training and improper training techniques (52,53,61). Each of these factors can be positively influenced with qualified instruction and supervision.

PREPARTICIPATION SCREENING AND CLEARANCE

STANDARD 1.1

Strength and Conditioning professionals can only work with participants who have undergone health care provider screening and clearance before participation, in accordance with instructions specified by the AAFP-AAP-ACSM-AMSSM-AOSSM-AOASM Pre-participation Physical Evaluation Task Force (46), the AHA and ACSM (3,35,36), as well as relevant governing bodies and/or their constituent members (e.g., NCAA/NAIA (44) for collegiate athletes; state legislatures, or individual state high school athletic associations/districts for scholastic athletes). In the collegiate athletics environment, the Athletic Training staff is involved in this process in accordance with NATA guidelines. In recreational activity programs, Strength and Conditioning professionals must require participants to undergo preparticipation screening and clearance in accordance with AHA and ACSM recommendations (3,35,36). For children, the clearance decision must include a determination or certification than the child has reached a level of maturity allowing participation in such activities as addressed in the "Participation in Strength and Conditioning Activities by Children" standards statement (refer to guideline 8).

GUIDELINE 1.1

Strength and Conditioning professionals should cooperate and communicate with each of a training participant's health care providers and provide service in the participant's best interest according to instructions specified by such providers.

PERSONNEL QUALIFICATIONS

GUIDELINE 2.1

The Strength and Conditioning practitioner should acquire a minimum of a bachelor's or master's degree from an accredited college or university (verification by transcript or degree copy) in one or more of the topics comprising the "Scientific Foundations" domain identified in the Certified Strength and Conditioning Specialist (CSCS) Examination Content Description (42) (see Appendix 1), or in a related subject area. An ongoing effort should also be made to acquire knowledge and skills in the other content areas.

GUIDELINE 2.2

The Strength and Conditioning practitioner should achieve and maintain

professional certification(s) with continuing education requirements and a code of ethics, such as the CSCS credential offered through the NSCA (see Appendix 2). Depending on the practitioner's scope of activities, responsibilities, and knowledge requirements, related certifications offered by other governing bodies may also be appropriate.

GUIDELINE 2.3

The productivity of a Strength and Conditioning staff member, as well as learning and skill development of individual members, should be enhanced by aligning a performance team composed of qualified practitioners with interdependent expertise and shared leadership roles (see Appendix 3). Once the team is assembled, respective activities and responsibilities from the domains identified in the Certified Strength and Conditioning Specialist (CSCS) Examination Content Description (42) (see Appendix 1), as well as appropriate liaison assignments, should be delegated according to each member's particular expertise.

PROGRAM SUPERVISION AND INSTRUCTION

STANDARD 3.1

Strength and conditioning programs must provide adequate and appropriate supervision by well-qualified and trained personnel, especially during peak usage times. To ensure maximum health, safety, and instruction, Strength and Conditioning professionals must be physically and mentally present during strength and conditioning activities, have a clear view of the entire facility (or at least the zone being supervised by each practitioner) and the participants in it, be physically close enough to the participants under their supervision to be able to see and clearly communicate with them, and have quick access to those in need of spotting or assistance.

STANDARD 3.2

In conjunction with appropriate safety equipment (e.g., power racks), attentive spotting must be provided for participants performing activities in which free weights are supported on the trunk or moved over the head/face (7,14).

GUIDELINE 3.1

Strength and conditioning activities should be planned, and the requisite number of qualified staff (refer to guideline 2) should be available such that recommended guidelines for minimum average floor space allowance per participant (100 ft^2), minimum professional-to-participant ratios (1:10 or lower junior high school, 1:15 or lower high school, 1:20 or lower college), and number of participants per barbell or training station (3) are achieved during peak usage times (23,56). Younger participants, novices, special populations, or participants engaged in complex-movement strength and conditioning activities should be provided with greater supervision (e.g., 1:12 instead of 1:20; refer to guideline 8). Strength and Conditioning practitioners and their employers should work together toward a long-term goal of matching the professional-to-participant ratio in the Strength and Conditioning facility to each sport's respective coach-to-athlete ratio (refer to Appendix 6).

FACILITY AND EQUIPMENT SET-UP, INSPECTION, MAINTENANCE, REPAIR AND SIGNAGE

STANDARD 4.1

Exercise devices, machines, and equipment, including free weights, must be assembled, set up, and placed in activity areas in full accordance with manufacturer's instructions, tolerances, and recommendations and with accompanying safety signage, instruction placards, notices, and warnings posted or placed according to ASTM standards so as to be noticed by users before use. In the absence of such information, professionals must complete these tasks in accordance with authoritative information available from other sources.

STANDARD 4.2

Before being put into service, all exercise devices, machines, and free weights must be thoroughly inspected and tested by Strength and Conditioning professionals to ensure they are working and performing properly and as intended by the manufacturer.

STANDARD 4.3

Exercise machines, equipment, and free weights must be inspected and maintained at intervals specified by manufacturers. In the absence of such specifications, these items must be regularly inspected and maintained according to a schedule determined by the Strength and Conditioning practitioner based on their knowledge and experience.

STANDARD 4.4

Exercise devices, machines, equipment, and free weights that are in need of repair, as determined by regular inspection or as reported by users, must be immediately removed from use until serviced and repaired and be re-inspected and tested to ensure that they are working properly before being returned to service. If such devices are involved in incidents of injury, legal advisors or risk managers must be consulted for advice before service/repair or destruction.

GUIDELINE 4.1

Strength and Conditioning professionals and their employers should ensure that facilities are appropriate for strength and conditioning activities. Factors to be reviewed and approved before activity include, but are not limited to, floor surface, lighting, room temperature and air exchange (24).

GUIDELINE 4.2

Manufacturer-provided user's manuals, warranties, and operating guides should be preserved and followed (refer to guideline 6).

GUIDELINE 4.3

All equipment, including free weights, should be cleaned and/or disinfected as recommended by the manufacturer and/or OSHA. Users should be

directed to wipe down skin-contact surfaces after each use.

EMERGENCY PLANNING AND RESPONSE

STANDARD 5.1

Strength and Conditioning professionals must be trained and certified in current guidelines for CPR established by AHA/ILCOR (1). Training in universal precautions for preventing disease transmission established by the CDC (51) and OSHA (43) is required if personnel are not immediately available to properly respond to exposure to blood or other potentially infectious materials. First Aid training/certification is also necessary if Sports Medicine personnel (e.g., MD or ATC) are not immediately available during strength and conditioning activities. New staff engaged in strength and conditioning activities must comply with this standard within 6 months of employment.

STANDARD 5.2

Strength and Conditioning professionals must develop a written, venue-specific emergency response plan to deal with incidents such as injuries, lightning strikes, and reasonably foreseeable untoward events within each facility. The plan must be posted at strategic areas within each facility and practiced at least quarterly. The emergency response plan must be initially evaluated (e.g., by facility risk managers, legal advisors, medical providers, and/or off-premise emergency response agencies) and modified as necessary at regular intervals. As part of the plan, a readily accessible and working telephone must be immediately available to summon on-premise and/or off-premise emergency response resources.

GUIDELINE 5.1

The components of a written and posted emergency response plan should include access to a physician and/or emergency medical facility when warranted; communication and transportation between the venue and the medical facility; appropriate and necessary emergency care equipment on-site that is quickly accessible; and a thorough understanding of the personnel and procedures associated with the plan by all individuals (refer to Appendix 7).

RECORDS AND RECORD KEEPING

GUIDELINE 6.1

In conjunction with written policies and procedures, Strength and Conditioning professionals should develop and maintain various records including manufacturer-provided user's manuals, warranties, and operating guides; equipment selection, purchase, installation, set-up, inspection, cleaning, maintenance, and repair records; personnel credentials; professional standards and guidelines; safety policies and procedures, including a written emergency response plan (refer to standard 5); training logs, progress entries, and/or activity instruction/supervision notes; and injury/incident reports, preparticipation medical clearance, and return to participation clearance documents. All records should be kept as securely as possible, with limited access by anyone not on staff. Examples of securing records include locked filing cabinets and password-protected computers and computer files. In settings where participants are not otherwise required to sign protective legal documents (e.g., informed consent, agreement to participate, waiver; refer to Appendix 8) covering all athletically related activities, the Strength and Conditioning professional should have such legal documents prepared by an appropriate professional, for participants under his/her supervision. These records should be preserved and maintained for a period determined by the institution where the facility is housed or professional legal advice and consultation.

EQUAL OPPORTUNITY AND ACCESS

STANDARD 7.1

Strength and Conditioning professionals and their employers must provide facilities, training, programs, services, and related opportunities in accordance with all laws, regulations, and requirements, mandating equal opportunity, access, and nondiscrimination. Such federal, state, and possibly local laws and regulations apply to most organizations, institutions, and professionals. Discrimination or unequal treatment based on race, color, national origin, religion, sex, gender identity and expression, political affiliation, age, disability, veteran status, genetic information or sexual orientation, or other such legal classifications is generally prohibited.

GUIDELINE 7.1

If a Strength and Conditioning professional witnesses any discriminatory or unequal treatment of individuals while performing duties in the scope of employment, the illegal conduct must be immediately reported to a supervisor, compliance department, and/or the general counsel for the employment entity. To protect the interests of the Strength and Conditioning professional, it is also recommended to consult with a private legal counsel when the foregoing situation is encountered.

PARTICIPATION IN STRENGTH AND CONDITIONING ACTIVITIES BY CHILDREN

GUIDELINE 8.1

Children younger than 7 years should not be permitted to engage in strength and conditioning activities with free weights or exercise devices/machines in facilities designed for use by adults and adolescents and should be denied access to such training areas. Other forms of strength and conditioning activities may be beneficial for such children, and should be recommended according to the established guidelines (12,32,33), and with a greater degree of instruction and supervision than that supplied to adolescents and adults. Children participating in such activities should be cleared as specified in the NSCA's "Standard for Preparticipation Screening and Clearance" (refer to standard 1).

GUIDELINE 8.2

Children between 7 and 14 years of age who have reached a level of physical, emotional, and intellectual maturity allowing participation in specified strength and conditioning activities, as determined and certified by their medical care provider (or by the Strength and Conditioning professional acting in concert with a child's medical care provider), and after clearance for participation as specified in the NSCA's "Standard for Pre-participation Screening and Clearance" (refer to standard 1), should be individually assessed by the Strength and Conditioning professional in conjunction with the child's parent(s)/guardian(s)/custodian(s) to determine whether such children may engage in such activities in areas containing free weights and exercise devices/machines generally used by adults and older children. If so permitted, such activities should be developed and implemented according to established guidelines (12,32,33) and with a greater degree of instruction and supervision than that supplied to adolescents and adults.

GUIDELINE 8.3

Children who are 14 years of age and older, according to the Strength and Conditioning practitioner's professional judgment, have reached a level of physical, emotional, and intellectual maturity, allowing them to engage in specified Strength and Conditioning activities (provided they have been granted parental consent and been cleared for participation as specified in the NSCA's "Standard for Pre-participation Screening and Clearance"; refer to standard 1), may engage in such activities in areas containing free weights and exercise devices/machines generally used by adults and with a greater degree of instruction and supervision than that supplied to adult populations while training.

SUPPLEMENTS, ERGOGENIC AIDS, AND DRUGS

STANDARD 9.1

Strength and Conditioning professionals must not prescribe, recommend, or provide drugs, controlled substances or supplements that are illegal, prohibited, or harmful to participants for any purpose including enhancing athletic performance, conditioning, or physique. Only those substances that are lawful (via third-party testing) and have been scientifically proven to be beneficial, or at least not harmful, may be recommended to participants by Strength and Conditioning professionals, and only to individuals age 18 or above and not in an individualized manner.

APPENDIX 1. STRENGTH AND CONDITIONING PRACTITIONER DEFINITION

In 1996, 2004, and again in 2012, the NSCA Certification Commission (changed to Certification Committee in 2008) and its examination service conducted a Job Analysis study with the purpose of surveying the activities, responsibilities, and knowledge requirements of a Certified Strength and Conditioning Specialist (CSCS). The results were used to describe the job activities of the CSCS in sufficient detail to provide a basis for the development of a professional, job-related certification examination that will certify strength and conditioning specialists as competent professionals. An early step in the process was to create a "practitioner" definition. Essentially, this definition is a job description that establishes the legal and professional scope of practice of the appropriate activities of a CSCS (refer to Appendix 2):

Certified Strength and Conditioning Specialists are professionals who apply foundational knowledge in a practical setting to assess, motivate, educate, and train athletes for the primary goal of improving sport performance. They conduct general physical and sport-specific testing sessions, design and implement safe and effective strength training and conditioning programs, and provide guidance for athletes in nutrition and injury prevention. Recognizing their area of expertise is separate and distinct from the medical, dietetic, athletic training, and sport coaching fields; Certified Strength and Conditioning Specialists consult with and refer athletes to these professionals when appropriate.

The 1996 CSCS Job Analysis study evaluated the results of a questionnaire sent to randomly selected NSCA members who were CSCS-certified as of October 1996. Respondents were asked to assign an importance to 112 tasks that a CSCS typically performs on the job. From these data, the NSCA Certification Commission's CSCS Job Analysis Committee determined the inclusion criteria of the tasks (5 of the original 112 were excluded), the distribution of tasks within each CSCS examination domain and its subcategories, as well as distribution of the examination question type (i.e., recall, application, and analysis) within each domain and its subcategories. The document resulting from the CSCS Job Analysis study is the "CSCS Examination Content Outline," which forms the basis for the Certified Strength and Conditioning Specialist (CSCS) Examination Content Description (42), an examination preparation resource available through the NSCA. The 2004 questionnaire was sent to certified individuals and the new results were used to change the format of the examination, with more emphasis placed on the practical/applied section. In 2012, survey data results were reviewed by the CSCS Job Analysis Committee and decision rules were established. These rules were used to determine which tasks were appropriate for assessment and inclusion in the final test content outline.

CSCS EXAMINATION CONTENT OUTLINE

Adapted from: Certified Strength and Conditioning Specialist (CSCS) Examination Content Description (42)

Scientific foundations

I. Exercise Sciences (59 questions)
- A. Apply knowledge of muscle anatomy and physiology.
- B. Apply knowledge of neuromuscular anatomy and physiology.
- C. Apply knowledge of basic principles of biomechanics regarding exercise selection, execution, and sport performance.

D. Apply knowledge of bone and connective tissue (tendons and ligaments) anatomy and physiology.
E. Apply knowledge of bioenergetics and metabolism.
F. Apply knowledge of neuroendocrine physiology.
G. Apply knowledge of cardiopulmonary anatomy and physiology.
H. Apply knowledge of physiological adaptations to exercise and training.
I. Apply knowledge of the anatomical, physiological, and biomechanical differences of athletes (e.g., age, sex, training status, specific sport or activity).
J. Apply knowledge of psychological techniques used to enhance the training and performance.

II. Nutrition (21 questions)
A. Apply basic knowledge of nutritional factors affecting health and performance.
B. Apply basic strategies for manipulating food choices and training methods to maximize performance.
C. Recognize signs, symptoms, and behaviors associated with eating disorders and altered eating habits.
D. Apply basic knowledge of the effects, risks, and alternatives of common performance-enhancing substances and methods.

III. New "untried" questions (15 nonscored questions)

Practical/applied

I. Exercise Technique (38 questions)
A. Teach and evaluate resistance training exercise technique.
B. Teach and evaluate plyometric exercise technique.
C. Teach and evaluate speed/sprint technique (e.g., resisted and assisted sprinting, speed-strength).
D. Teach and evaluate agility technique (e.g., forward, backward, and lateral movements; turn, transition, acceleration, and deceleration maneuvers).
E. Teach and evaluate metabolic conditioning/energy systems development.
F. Teach and evaluate flexibility exercise technique.
G. Teach spotting procedures and techniques.

II. Program Design (39 questions)
Based on an athlete's health status, training age, capabilities, and training goals, design training programs that maximize performance and minimize injury potential by
A. Incorporating various training methods and modes.
B. Selecting exercises.
C. Applying the principles of exercise order.
D. Determining and assigning exercise intensities (e.g., load, resistance, heart rate).
E. Determining and assigning training volumes (defined as sets × reps).
F. Determining and assigning work/rest periods, recovery and unloading, and training.
G. Determining and assigning exercise progression (e.g., mode, intensity, duration, frequency).
H. Applying the principles of periodization.
I. Designing programs for an injured athlete during the reconditioning period (e.g., assigning exercises for a given injury or condition in collaboration with sport medicine professionals).

III. Organization and Administration (13 questions)
A. Determine the design, layout, and organization of the strength and conditioning facility (e.g., flooring, ceiling height, mirror placement, ventilation, lighting, characteristics of the equipment) based on athletic needs and industry standards.
B. Determine the primary duties and responsibilities of the members of the strength and conditioning staff.
C. Determine the policies and procedures associated with the operation of the strength and conditioning facility (e.g., facility/equipment cleaning and maintenance, rules, scheduling, emergency procedures).
D. Create a safe training environment within the strength and conditioning facility.

IV. Testing and Evaluation (20 questions)
A. Select and administer tests to maximize test reliability and validity.
B. Administer test protocols and procedures to ensure reliable data collection.
C. Evaluate and interpret test results.

V. New "untried" questions (15 nonscored questions)

APPENDIX 2. CERTIFIED STRENGTH AND CONDITIONING SPECIALIST (CSCS) PROGRAM

The CSCS program was initiated in 1985 to identify individuals who possess the knowledge and skills to design and implement safe and effective strength and conditioning programs. This certification program encourages a higher level of competence among practitioners, which ultimately raises the quality of strength training and conditioning programs for athletes by those who are CSCS-certified.

A CSCS educates and trains primarily athletes in proper strength training and conditioning practices. Strength and Conditioning CSCS professionals work in a variety of environments, including high school, college, university, and professional institutions, sports medicine clinics, health, and fitness clubs, corporate wellness centers, and in professional sports. Competencies assessed in the CSCS examination are determined through a Job Analysis conducted by an independent professional examination service based on input from current Strength and Conditioning professionals. Every step in the process leading to the development of valid certification examinations meets the stringent guidelines of the National Commission for Certifying Agencies (NCCA). Pass/fail rates and reliability statistics are published annually.

Writers of the examinations include renowned practitioners, researchers, educators, and psychometricians. Although there are many certification programs associated with physical training, the CSCS certification examination program is 1 of only 2 that have been specifically designed to assess the competencies of those who strength train and condition athletes.

ACCREDITATION

In 1993 the NSCA Certification Commission certification program became the first fitness-related certification accredited by the esteemed NCCA*. The rigorous CSCS and NSCA-Certified Personal Trainer (NSCA-CPT) examinations are among the most challenging in the industry.

*Note: The NCCA is the accreditation body of the Institute for Credentialing Excellence, a nonprofit nongovernment agency that promotes excellence in competency assurance for practitioners in all occupations and professions. The NCCA measures the ability of certifying organizations in any industry to accurately discriminate between qualified and unqualified professionals. To earn NCCA recognition, a credentialing body must demonstrate an ability to develop and administer psychometrically sound examinations that effectively differentiate qualification level through a series of criteria, including:

- The certifying organization is responsible for all decisions pertaining to certification and recertification (including, but not limited to, examination content, eligibility requirements, grievance and disciplinary policies, setting fees, program operation, etc.) without being subject to approval by any other body.
- The examination is developed from a Job Analysis study.
- Pass/fail rates and reliability statistics are a matter of public record.
- Examination development involves qualified professionals, such as content experts and psychometricians with expertise in examination development.

Accreditation for professional or personnel certification programs provides impartial, third-party validation that the program has met recognized national and international credentialing industry standards for development, implementation, and maintenance of certification programs.

CSCS EXAMINATION FORMAT

To earn the CSCS credential, candidates must pass a rigorous examination that consists of 2 sections. A candidate must pass both sections to be CSCS-certified (and may retake any section not passed). The first section, called "Scientific Foundations", consists of 80 scored multiple-choice questions in the areas of:

- Exercise Sciences (Anatomy, Exercise Physiology, Biomechanics, Sport Psychology)
- Nutrition

The second section, "Practical/Applied", consists of 110 scored multiple-choice questions, 30–40 of which contain video and/or images that assess competencies in exercise techniques, functional anatomy, and testing procedures with the exercises, muscles, and/or joints shown. The areas covered include:

- Exercise Technique
- Program Design
- Organization and Administration
- Testing and Evaluation

CONTINUING EDUCATION PROGRAM

The purpose of having continuing education as part of a certification program is to encourage certificants to stay abreast of evolving knowledge and skills in the profession, and, in doing so, to promote the ongoing competency of those who are certified. The NSCA requires each certificant to do the following to remain certified:

- Complete 6 continuing education units (CEUs) or a prorated amount of CEUs if certified within the 3-year reporting period.
- Maintain current CPR certification.
- Submit a completed CEU Reporting Form and recertification fee.
- Maintain documentation of activities listed on the CEU Reporting Form.

The NSCA is committed to certifying individuals who demonstrate the knowledge and skills necessary to design and implement safe and effective strength training and conditioning and personal training practices. With the credibility possessed by the CSCS and NSCA-CPT examinations comes the responsibility to ensure the integrity of the credentials awarded. This philosophy implies that the responsibility of its certificants is not limited to the well-being of the athletes and/or clients, and the reputation of others in their field; with the overall goal being an improvement of health and well-being for all.

The NSCA is dedicated to maintaining a high standard for its members and certificants. The following Code of Ethics assures that CSCS and NSCA-CPT certificants are aware of the standards of ethical behavior that should be followed in the practice of their profession.

Principle 1: Certificants shall respect the rights, welfare, and dignity of all individuals.

1.1. Certificants shall not discriminate on the basis of race, color, national origin, religion, sex, gender identity and expression, political affiliation, age, disability, veteran status, genetic information or sexual orientation, or other such legal classifications.

1.2. Certificants shall provide competent, fair, and equal treatment to all individuals.

1.3. Certificants shall preserve the confidentiality of personal and privileged information of the athlete, client, or the NSCA.

1.4. Certificants shall not release any information to a third party not involved with the athlete's or client's care without a written release unless required by law.

Principle 2: Certificants shall comply with all applicable state, local and federal laws, and NSCA Bylaws, policies, and procedures.

2.1. Certificants shall comply with all institutional guidelines.

2.2. Certificants shall comply with all copyright laws.

2.3. Certificants shall be familiar with and follow the NSCA Bylaws and all applicable policies, procedures, rules, standards and guidelines.

2.4. Certificants shall not condone or engage in any illegal or unethical behavior.

Principle 3: Certificants shall maintain and promote high standards.

3.1. Certificants shall not misrepresent, either directly or indirectly, their skills, training, professional credentials, identity, or services.

3.2. Certificants shall only provide services they are qualified to

provide through education or experience and which are allowed by practice acts and other pertinent regulations.

3.3. Certificants shall refer athlete or client to more qualified fitness, medical, or health care professional when appropriate.

3.4. Certificants who are researchers or educators shall maintain and promote ethical conduct in research and educational activities.

3.5. Certificants should strive to continuously improve knowledge, skills, and techniques to protect the athlete or client from injury.

Principle 4: Certificants shall not engage in any behavior or form of conduct that adversely reflects on the NSCA.

4.1. Certificants should conduct themselves personally and professionally in a manner that does not compromise their professional responsibility.

4.2. Certificants shall not place financial gain above the welfare of the NCSA, athlete's or client's and shall not in any arrangement exploit the NSCA, athlete or client.

4.3. Certificants shall avoid substance abuse and, if necessary, seek rehabilitation for chemical dependency.

Certificants should also strive to safeguard the public by reporting violations of this Code of Ethics.

APPENDIX 3. STRENGTH AND CONDITIONING PERFORMANCE TEAM DEVELOPMENT

Teams are preferable to single-leader groups when there is a need for collective work products (i.e., multiple skills, judgments, and experiences) by members working together in real time, shifting leadership roles, and mutual as well as individual accountability (27,28). By contrast, single-leader/hierarchical work groups are appropriate when the sum of independent workers' contributions is adequate, singular rather than shared leadership is effective, task(s) and corresponding solution(s) are familiar, workers' skills can be applied productively without interaction (other than sharing information), and speed and efficiency have priority over extra performance results (27,28).

Extraordinarily demanding challenges are the driving forces behind high-performance teams. Common features of such teams include (27,28):

- Members are committed to a clear mission, common approach, collaboration, and mutual accountability and responsibility.
- Expectations and goals are high but achievable, and performance evaluation is based on results.
- Roles are interdependent; leadership is shared; abilities, experiences, expertise, knowledge, skills, and talents are complementary; contribution, participation, and influence are balanced.
- Effective task performance is facilitated by encouraging and rewarding creativity, innovation, and risk taking in all decision making or problem solving activities.

The strength and conditioning staff can be aligned through hiring of practitioners with formal education and specialization in specific scientific foundations (e.g., anatomy, exercise physiology, biomechanics, sport psychology) (42). An assembled team allows for cooperative expertise by practitioners with complementary skills and provides an educational opportunity for staff members to gain knowledge outside their specialization by working with outside liaisons. The table below provides a practical example of a strength and conditioning performance team. The director of strength and conditioning is responsible for delineating the appropriate duties and responsibilities to the rest of the strength and conditioning staff for program design, exercise technique, organization and administration, and testing and evaluation (56).

Scientific foundations education/Expertise	Practical and applied activities/Responsibilities	Liaison assignment(s)
Exercise/sport anatomy; biomechanics	Exercise technique; testing and evaluation; rehabilitation and reconditioning	Exercise/sport scientist; team coaches; sports medicine team
Exercise/sport physiology	Program design; testing and evaluation	Exercise/sport scientist; team coaches
Exercise/sport nutrition	Nutrition	Exercise/sport scientist; sport nutritionist/dietitian
Exercise/sport pedagogy	Program design; exercise technique; organization and administration	Exercise/sport scientist; team coaches; athletic administration
Exercise/sport psychology; motor learning	Exercise technique; rehabilitation and reconditioning	Exercise/scientist; sports medicine team; team coaches
Training methodology	Program design; organization and administration	Exercise/sport scientist; team coaches; athletic administration
Kinesiology; physiotherapy; sports medicine	Rehabilitation and reconditioning	Sports medicine team

Area	Examples	Formula
Prone and supine exercises	Bench press; lying triceps extension	Actual weight bench length (6–8 ft) + safety space cushion of 3 ft multiplied by suggested user space for weight bench width of 7 ft + safety space cushion of 3 ft. Example: If using a 6 ft long weight bench for the bench press exercise (6 ft + 3 ft) × (7 ft + 3 ft) = 90 ft (2)
Standing exercises	Biceps curl; upright row	Actual bar length (4–7 ft) + double-wide safety space cushion of 6 ft multiplied by suggested user space for standing exercise width of 4 ft. Example: If using a 4 ft curl bar for the biceps curl exercise (4 ft + 6 ft) × (4 ft) = 40 ft (2)
Standing exercises in a rack	Back squat; shoulder press	Actual bar length (5–7 ft) + double-wide safety space cushion of 6 ft multiplied by suggested user space for standing exercise in a rack width of 8–10 ft. Example: If using a 7 ft. Olympic bar for the back squat exercise (7 ft + 6 ft) × (10 ft) = 130 ft (2)
Olympic lifting area	Power clean	Lifting platform length (typically 8 ft) + perimeter walkway safety space cushion of 4 ft multiplied by lifting platform width (typically 8 ft) + perimeter walkway safety space cushion of 4 ft. Example: (8 ft + 4 ft) × (8 ft + 4 ft) = 144 ft (2)

APPENDIX 4. STRENGTH AND CONDITIONING FACILITY SCHEDULING

TABLE D1. CALCULATIONS FOR SPACE NEEDS (24)

Note: Many facilities use combination platforms and racks (multi-purpose training stations) as a way to save space and allow participants to complete several exercises in 1 location. Accordingly, the standing rack and Olympic lifting area calculations above should be combined.

APPENDIX 5. STRENGTH AND CONDITIONING TRAINING PLAN DEVELOPMENT

A detailed discussion of developing a Strength and Conditioning training plan is beyond the scope of this project. For more specific information on program design, the Strength and Conditioning practitioner should refer to Chapters 17–21 of Essentials of Strength Training and Conditioning, 4th edition (15) as well as the NSCA position statements listed below.

NSCA Position Statements (https://www.nsca.com/nsca-tools-and-resources/); PDF files (Accessed 11/5/2017).

Long-Term Athletic Development–2016

Androgen and Human Growth Hormone Use–2009

Youth Resistance Training–2009

APPENDIX 6. NCAA DIVISION I ATHLETE-TO-COACH RATIOS

TABLE F1: NCAA DIVISION I OVERALL CHAMPIONSHIP SPORTS PARTICIPATION (2014–15) AND RESULTING ATHLETE-TO-COACH RATIOS, AS THE ONLY DIVISION WITH LIMITATIONS ON NUMBER OF COACHES (NCAA DIVISION I MANUAL, BYLAW 11.7) (40)

TABLE F2: NCAA DIVISION I MEN'S CHAMPIONSHIP SPORTS PARTICIPATION (2014–15) AND RESULTING ATHLETE-TO-COACH RATIOS, BY SPORT (40)

TABLE F3: NCAA DIVISION I WOMEN'S CHAMPIONSHIP SPORTS PARTICIPATION (2014–15) AND RESULTING ATHLETE-TO-COACH RATIOS, BY SPORT (40)

APPENDIX 7. EMERGENCY CARE AND PLANNING

Source: NCAA Sports Medicine Handbook (44)

EMERGENCY CARE AND COVERAGE

Reasonable attention to all possible preventive measures will not eliminate sports injuries. Each scheduled practice or contest of an institution-sponsored intercollegiate athletics event, as well as out-of-season practices and skills sessions, should include an emergency plan. Like student-athlete welfare 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 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

Sport	Teams	Athletes	Average squad size	Limit on no. of coaches	Athletes per coach
Total (men + women)	6,475	175,952		112	
Average (39 sports)			27.2	2.9	9.5

Sport	Teams	Athletes	Average squad size	Limit on no. of coaches	Athletes per coach
Baseball	295	10,396	35.2	3	11.8
Basketball	345	5,432	15.7	4	3.9
Cross country	311	4,845	15.6	2	7.8
Fencing	20	383	19.2	2	9.6
Football	250	27,873	111.5	11	10.1
Golf	297	2,947	9.9	2	5.0
Gymnastics	15	304	20.3	3	6.8
Ice hockey	59	1,638	27.8	3	9.3
Lacrosse	68	3,109	45.7	3	15.2
Rifle	17	131	7.7	2	3.9
Skiing	11	155	14.1	2	7.0
Soccer	200	5,738	28.7	3	9.6
Swimming/diving	134	3,839	28.6	3	9.5
Tennis	258	2,678	10.4	2	5.2
Track (indoor)	257	10,174	39.6	3	13.2
Track (outdoor)	278	11,067	39.8	3	13.3
Volleyball	21	405	19.3	3	6.4
Water polo	22	566	25.7	2	12.9
Wrestling	76	2,520	33.2	3	11.1
Total	2,934	94,200		59	
Average (19 sports)			32.1	3.1	10.4

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 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 before deployment. In addition, emergency information about the student-athlete should be available both on campus and while traveling for use by medical personnel;
6. An inclement weather policy that includes provisions for decision making and evacuation plans (See NCAA Guideline 1E);
7. A thorough understanding by all parties, including the leadership of visiting teams, of the personnel and procedures associated with the emergency care plan;
8. Certification in CPR techniques, first aid, and prevention of disease transmission (as outlined by OSHA guidelines) should be required for all athletics personnel associated with practices, competitions, skill instruction, and strength and conditioning. New staff engaged in these activities should comply with these rules within 6 months of employment;
9. A member of the institution's sports medicine staff should be empowered to have the unchallengeable authority to cancel or modify a workout for health and safety (i.e., environmental changes), as he or she deems appropriate;
10. Institutions should ensure that the emergency action plan 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 emergency action plan should provide that appropriate medical staff have access to the injured athlete without interference; and
11. Institutions should have on file and annually update an emergency action plan for each athletics venue

Sport	Teams	Athletes	Average squad size	Limit on no. of coaches	Athletes per coach
Basketball	343	4,984	14.5	4	3.6
Bowling	34	299	8.8	2	4.4
Cross country	342	6,031	17.6	2	8.8
Fencing	24	397	16.5	2	8.3
Field hockey	77	1,732	22.5	3	7.5
Golf	259	2,170	8.4	2	4.2
Gymnastics	61	1,085	17.8	3	5.9
Ice hockey	35	846	24.2	3	8.4
Lacrosse	106	3,172	29.9	3	10.0
Rifle	24	151	6.3	2	3.2
Rowing	88	5,668	64.4	3	21.5
Skiing	12	175	14.6	2	7.3
Soccer	326	8,963	27.5	3	9.2
Softball	289	6,044	20.9	3	7.0
Swimming/diving	195	5,393	27.7	3	9.2
Tennis	318	2,912	9.2	2	4.6
Track (indoor)	319	12,816	40.2	3	13.4
Track (outdoor)	329	13,075	39.7	3	13.2
Volleyball	328	5,165	15.7	3	5.2
Water polo	32	674	21.1	2	10.5
TOTAL	3,541	81,752		53	
Average (20 sports)			23.1	2.7	8.7

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 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.

LIGHTNING SAFETY

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. Although 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. 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:

A. Develop a lightning safety plan for each outdoor venue. At a minimum, the plan should include the following:

1. 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 on the first sound of thunder, lightning is likely within 8 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 because of severe weather.
2. 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 suspend activity.
3. 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.
4. 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 thunderstorm "watches" or "warnings" and the warning signs of developing thunderstorms in the area, such as high winds or darkening skies. A "watch" means that 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.
5. 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:a. 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.b. In the absence of a sturdy, frequently inhabited building, any vehicle with a hard metal roof (neither a convertible nor a golf cart) with the windows shut provides a measure of safety. The hard metal frame and roof, not the rubber tires, are what protects occupants by dissipating lightning current around the vehicle and not through the occupants. It is important not to touch the metal framework of the vehicle. Some athletics events rent school buses as safer locations to place around open courses or fields.

B. For large-scale events, continuous monitoring of the weather should occur from the time pre-event activities begin throughout the event.

C. Venue-specific activity-suspension, venue evacuation, and activity-resumption plans:

1. On the first sound of thunder, lightning is likely within 8 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 before an outdoor practice or event.
2. 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.
3. 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.
4. 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 resetting the 30-minute "return-to-play" clock before resuming outdoor athletics activities.

D. Emergency care protocols: People who have been struck by lightning do not carry an electrical charge. Therefore, 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 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.

APPENDIX 8. PROTECTIVE LEGAL DOCUMENTS

Notes: This appendix provides general legal information. Protective legal documents should not be adopted or used in any context without individualized legal advice. The information in this appendix has been adapted with permission from an article by JoAnn Eickhoff-Shemek, entitled "Distinguishing Protective Legal Documents", published in the ACSM's Journal of Health and Fitness (8).

TYPES OF PROTECTIVE LEGAL DOCUMENTS

Institutions such as universities/colleges and high schools often require athletes to read and comprehend, and sign some type of protective legal document(s) before participation in athletically related activities, including strength and conditioning. These documents can help protect the institution and its employees from potentially costly legal claims and lawsuits. The law involving protective legal documents is quite complex, and understanding their function and the specific legal protection they provide is often confusing.

Several types of protective legal documents exist. Three that are commonly used in the health/fitness field may be applicable in Strength and Conditioning settings: informed consent, agreement to participate, and waiver. Each provides protection from lawsuits arising from certain types of injuries that can occur while participating in activities, as explained below.

CAUSES OF INJURY ASSOCIATED WITH PHYSICAL ACTIVITY

There are 3 causes of injury associated with physical activity: inherent risks, negligence, and extreme forms of conduct (10).

Inherent risks

As the term implies, these risks are inherent in the activity. Generally, injuries caused by inherent risks are accidental in nature, not preventable, and no one's fault. The informed consent and agreement to participate documents provide the best legal protection for lawsuits arising from such injuries. Although actual sections and content of protective documents vary (and depend upon state law), the following are generally included in informed consent and agreement to participate documents:

Informed consent.

- Purpose of the activity
- Risks of the activity*
- Benefits of the activity
- Confidentiality
- Inquiries
- Signatures

Agreement to participate.

- Nature of the activity
- Possible consequences of injury*
- Behavioral expectations of the participant
- Condition of the participant
- Concluding statement
- Signatures

*Note: "assumption of risk" language.

A section within each of these documents is devoted to informing the participant of the potential risks, including those inherent in the activity. It is important that this section carefully describes these risks (e.g., types of accidents that might occur and the consequences of these accidents), and that the language used is understandable to the person who will be signing it. This provides an "assumption of risk" defense, meaning the participant knew and fully understood the risks, appreciated the risks, and voluntarily assumed them. In general, the law does not allow individuals to recover compensation for injuries resulting from assumed risks.

Negligence

Injuries can be caused by negligence, which is a failure to act as a reasonable and prudent professional would act under the circumstances. Participants can be injured by negligent acts of the Strength and Conditioning staff (e.g., failure to inspect/maintain exercise equipment, failure to provide CPR or First Aid when needed). A waiver document, also called a prospective release, provides the best legal protection for lawsuits arising from injuries caused by negligence. Once again, while the actual sections and content of such documents vary depending on state law, waiver documents generally include exculpatory clause; description of risks ("assumption of risk" language); indemnification language (may not be valid); severability clause; affirmation of legal capacity; and signatures.

The "exculpatory clause" is a key section within the waiver explicitly stating that the participant releases the Strength and Conditioning facility for any liability associated with negligence by the facility or its employees. This clause, which must be written very carefully to be enforceable, provides evidence that the participant gave up (waived) his/her right to file a negligence lawsuit against the facility. However, the exculpatory clause does not provide protection from lawsuits arising from injuries because of inherent risks, and an "assumption of risk" section is often added to the waiver for this purpose.

Extreme forms of conduct

Injuries can also be caused by extreme forms of conduct (often called gross negligence, willful and wanton conduct, or reckless conduct). For example, if the Strength and Conditioning staff had previous knowledge of an existing danger or risk but took no corrective action to help prevent resulting injuries, this failure to act would most likely constitute an extreme form of conduct. Generally, no documents can provide legal protection for grossly negligent or reckless conduct. A few states may allow the use of a waiver to protect from such conduct, but most do not (11).

MAKING PROTECTIVE LEGAL DOCUMENTS ENFORCEABLE

Protective legal documents, signed by participants before their participation in strength and conditioning programs and services, can provide a good defense for the Strength and Conditioning facility after an injured participant files a claim or lawsuit. A variety

of factors should be considered for these forms to be legally enforceable (8,20):

- A lawyer who is knowledgeable about the law regarding protective documents must review your protective legal documents to help ensure they are written properly and reflect the law in your state.
- Informed consent and waiver documents are contracts, and can only be signed by adults because minors cannot enter into a contract. "Agreement to participate" documents are not contracts, and therefore can be signed by adults as well as minors.
- The exculpatory clause used in a waiver is not allowed in an informed consent or agreement to participate. If an exculpatory clause is added to an agreement to participate for adults, it then becomes a waiver.
- The exculpatory clause used in a waiver is not enforceable in medical or research settings, or in certain states where they are against public policy. In educational settings such as a college/university, the general rule is that waivers are against public policy for required activities but may be enforceable for voluntary activities.
- Informed consent documents used in medical settings must be provided before a patient has any kind of medical procedure. If the informed consent is not written or administered properly, the health care provider (and medical facility) could be found negligent for not informing the patient of particular risks. This also applies in research settings because subjects must be properly informed of risks through informed consent (note that this point is applicable in Strength and Conditioning settings, where athletes participate as human subjects in research studies).
- All documents must be administered properly. For example, participants should have ample time to read them and a well-trained employee should verbally explain the document to each participant.
- Protective documents must be stored in a secure place for the amount of time consistent with the statute of limitations, which may be up to 4 years in some states.

The choice of document or combination of documents to use is a very important decision. In situations where strength and conditioning activities are not covered in the employing institution's legal documentation, Strength and Conditioning professionals should consult with a qualified lawyer to assist with these decisions and to review or write the documents before implementation. Because legal advice and consultation can be quite expensive, Strength and Conditioning professionals may reduce costs by "drafting" their own legal documents using information from applicable resources (e.g., most university research protection offices have examples of agreement to participate and waiver documents, and examples of informed consent documents). These resources should be shared with your lawyer when he/she reviews the drafts and makes the final document revisions.

Written protective documents provide important evidence when a lawsuit occurs. For example, if a Strength and Conditioning facility is sued for negligence, but has evidence that the injured party signed a properly written and administered waiver, this document provides the evidence needed to seek summary judgment (i.e., a pretrial motion in which the judge can dismiss the case because, as a matter of law, there is no issue to be tried in a court of law). In this situation, the legal document protects the facility from a potentially costly negligence lawsuit.

APPENDIX 9. NSCA PROFESSIONAL STANDARDS AND GUIDELINES TASK FORCE CONTRIBUTORS

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