Recommendations and Guidelines for
Appropriate Medical Coverage of Intercollegiate Athletics

Revised May 2003

The 2000 NATA Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics were revised in Winter 2003 following the completion of a two-year epidemiological study. This study tracked injury rates and treatments provided for those injuries in 50 colleges and universities across five competitive divisions. Based on the findings from these data and the most up-to-date injury information provided by the Big Ten Conference and National Collegiate Athletic Association's Injury Surveillance Systems, the AMCIA Recommendation and Guidelines were amended accordingly. Although the use of empirical data necessitated a change in the way some health care units were calculated, the revised recommendations are consistent in their premise and represent a more justifiable and objective system for determining the health care needs of each institution.

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National Athletic Trainers' Association

Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics

PREFACE

Two trends in college athletics are on a collision course. The first is the major change in college athletics itself over the past two decades. There are more teams (including women's sports), more non-traditional seasons and more strength and conditioning sessions. There are thus more events, more practices and more workouts at which injuries can occur.

The second trend is a legal one. Sports-related lawsuits have shifted *away* from equipment manufacturers and their "duty to warn" *toward* the health care delivery process. Universities are sued over whether they have properly trained health care professionals, whether they have enough of them, whether the health care providers have adequate plans to follow, whether they keep proper records, and whether they deliver proper treatment as a result. Recent highly publicized deaths of student-athletes have focused even more attention on university liability.

Colleges and universities that have not kept up with the first trend—the fundamental change in college athletics—may be failing to provide appropriate medical care to their student-athletes. And those that are unaware of the second trend may not have proper plans either for appropriate medical care or for appropriate legal defense.

The National Athletic Trainers' Association, an association of nearly 23,000 certified athletic trainers who are the first line of defense against athletic injuries, have issued guidelines to help universities deal with both their appropriate medical coverage needs and their liability concerns. These guidelines provide a means for institutions to determine their own highly individual needs – they do not create a new legal standard. Institutions can use the guidelines to demonstrate genuine efforts to meet legal standards of care that already exist and that are imposed after-the-fact.

Because of the rapidly changing collegiate athletic environment, NATA recognized it was important for someone to collect and analyze all of the injury and care information currently available to create a practical medical coverage model. The model and worksheet that NATA has developed allow institutions to figure out what their own appropriate medical coverage should be. The guidelines also give institutions something to rely on to show they have met current care standards if liability issues arise.

NATA has developed a system that will allow colleges and universities to quantify the amount of medical coverage they need. The system includes a number of variables known to affect the likelihood of injury, the severity of injury, the amount of care required for that injury, and other factors affecting health care professionals' time. Existing data and professional experience are used to assign weightings to each of these variables. The system then tells a university how much coverage (measured in *time*, called "health care units") it should provide.

Each college and university determines for itself the numbers that go into the system. The guidelines leave room for institutions to make sure their numbers reflect their unique situations. In addition, the guidelines introduce a second set of variables not included in the system. Institutions can manipulate these variables in order to match more closely their particular conditions.

NATA has developed an easy-to-use worksheet that each institution can fill out to develop its own numbers. NATA also provides a substantial amount of back-up and explanatory material to help institutions make their individual determinations.

The system, worksheet and accompanying guidelines strike a balance between guidance that is too vague to be useful ("provide appropriate coverage depending on the situation") or too rigid to fit individual needs ("always hire one allied health care professional for every 50 student-athletes"). The guidelines provide a way for athletic trainers, who are the collegiate medical coverage point people, to share their expertise with those responsible for the financial, legal, health care and athletic needs of colleges and universities.

The system says, in essence, that although many variables and uncertainties affect injury prevention and care, current knowledge is adequate to provide a rule of thumb for those responsible for medical coverage in the collegiate setting. Injuries will always occur and liability for these injuries already exists. It is therefore better to deal with both of these issues from a position of knowledge and planning.

The NATA guidelines are an effort to capture what is known about appropriate medical coverage and make it useful and easily available across the collegiate universe. It is no more than that, legally or substantively, but it is nevertheless a significant step forward for student-athletes and their colleges and universities.

INTRODUCTION

In February 1998, the National Athletic Trainers' Association (NATA) created the Task Force to Establish Appropriate Medical Coverage for Intercollegiate Athletics (AMCIA) to address concerns regarding the increased exposure of student-athletes to injury from the expansion of traditional seasons, non-traditional season practices and competitions, skill instruction sessions, and year-round strength and conditioning. Of additional concern were the elevated number of injuries, serious injuries and deaths of student-athletes at the collegiate level. The mission of the task force was to establish recommendations for appropriate medical coverage to assist institutions in providing the best possible health care for all intercollegiate student-athletes without discrimination. The AMCIA Recommendations and Guidelines (originally created in 2000) were based on accepted medical criteria (e.g., injury rates and severity), not on gender, sport or level of competition. The sole intent of the recommendations was to address student-athlete welfare issues with regard to the amount and quality of medical coverage provided them.

To systematically determine the appropriate level of medical coverage for each sport at an institution, the task force devised a rating system utilizing injury rates, the potential for catastrophic injury, and treatment/rehabilitation demands for both time loss and non-time loss injuries per sport. In addition to these indices, other relative factors, such as prolonged season exposure, squad size, travel requirements, and health care administrative duties, were used to determine health care loads and medical staffing needs. To form the basis for the recommendations and indices, the task force relied on existing literature, and where data were inadequate or unavailable, relied on the professional consensus and expertise of task force members.

Since the publication of this document in 2000, the NATA commissioned a two-year research study (conducted by John W. Powell, PhD, ATC, Michigan State University) with the goal of obtaining treatment and injury data for both time loss and non-time loss injuries for sports and all competitive divisions levels. The purpose of the study was to substantiate the AMCIA Recommendations and Guidelines with scientific data where previously the task force had to rely on expert consensus alone.

Injury rate and treatment data were tracked on all sport teams at 50 colleges and universities over two seasons. In addition to providing information on sports not previously reported on, these data confirmed that a considerable amount of time is spent in care of injuries not resulting in time loss, which suggests that both time loss and non-time loss injury rates should be considered when determining the health care needs of a particular sport. Based on the results of the Powell study, as well as up-to-date time loss injury rate data provided by the Big 10 Athletic Association and the NCAA's Injury Surveillance System, the AMCIA Recommendation and Guidelines were revised.

All updated data were instrumental in improving the accuracy and applicability of the system for determining health care loads. We are confident the Revised AMCIA Recommendations and Guidelines reflect a more scientifically defensible document that relies heavily on actual data, and less on expert consensus alone.

Consistent with the first edition, institutions are encouraged to view these recommendations as guidelines, not mandates, taking into consideration their unique individual needs. We encourage institutions to consider these recommendations a "living document" because further revisions may be required as more data become available, or as preventative techniques, rules and policies change.

DEFINITION FOR APPROPRIATE MEDICAL COVERAGE

Appropriate medical coverage involves more than basic emergency care during sports participation. It encompasses the provision of many other health care services for the student-athlete. While emergency medical care and event coverage are critical, appropriate medical coverage also includes activities of ongoing daily health care of the student-athlete, such as:

- Determination of athletes' readiness to participate, in conjunction with the team physician (e.g., pre-participation evaluation and post-injury/illness return)
- Risk management and injury prevention
- Recognition, evaluation and immediate treatment of athletic injuries/illnesses
- Rehabilitation and reconditioning of athletic injuries
- Psychosocial intervention and referral
- Nutritional aspects of injuries/illnesses
- Health care administration
- Professional development to maintain and improve knowledge and skills

BASIS FOR RECOMMENDATION

The task force reviewed current literature and compiled data pertaining to the topic. Included in the review were:

- Relevant published literature
- Guidelines and position statements from sports medicine organizations and associations
- Detailed institutional and conference studies (e.g., injury rates, treatments per injury rate)
- National surveys of current medical coverage
- Two-Year AMCIA Injury Surveillance Data (Powell & Dompier, In Review)
- NCAA Injury Surveillance System
- NCAA Emergency Care and Coverage Survey
- NCAA Sports Medicine Handbook
- Legal cases and settlements from athletic injuries

CONTENT

Contained in this document are:

- Revised Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics
- Revised System Worksheet and accompanying narrative to assist individuals in applying the recommendations (Appendix A)
- Updated Time Loss Injury Rate and Catastrophic Injury Rate classification tables (original Tables 7 and 11 respectively)
- Additional/updated references where indicated

SYSTEM FOR DETERMINING HEALTH CARE LOADS FOR EACH SPORT AND INSTITUTION

Each student-athlete, without consideration for sport, gender or level of competition, shall have equitable access to appropriate medical care, which should be directed by a college- or university-appointed team physician working in conjunction with a certified athletic trainer. After comprehensive study and analysis, the National Athletic Trainers' Association has issued the following recommendations for appropriate medical coverage.

In addition to those services provided by a qualified team physician[*], a system has been devised to assist in determining each collegiate setting's medical coverage needs. Items considered when creating this system were injury rates for both time loss and non-time loss injury, time required for treatment and rehabilitation of these injuries, potential for injury based on number of exposures over the length of season, travel requirements, onsite coverage needs and administrative demands placed on the athletic health care staff. To that end, the ensuing model has its foundation in **health care units (HCU).** As described in the sections to follow, each sport is assigned a base Health Care Index (HCI). The base HCI for each sport falls in the range of 1-4 units. While these values are based on available injury risk and treatment data, institutions can adjust these numbers as their own injury risk and treatment data dictate.

It is reasonable that one certified athletic trainer[**] can only manage so much in a given academic year (i.e., ~ one sport/season). Therefore, **one full-time certified athletic trainer may be responsible for ~12 health care units**, which should be considered a starting point for each institution. For example, if after applying the system a college or university has 48 total **health care units**, then that institution should have the equivalent of 4 (48 divided by 12) full-time certified athletic trainers, unless some of the units fall in the category of minimally qualified personnel. (Please see item "B," under Recommendations and Guidelines for Health Care Providers.) If an institution finds it equitable to increase or decrease the HCU load for its ATCs, it may do so with consideration to the health and welfare of the student-athlete.

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[*] ***Team Physician****: The team physician must have an unrestricted medical license and be an M.D. or D.O. who is responsible for treating and coordinating the medical care of athletic team members. The principal responsibility of the team physician is to provide for the well being of individual athletes - enabling each to realize his/her full potential. The team physician should possess special proficiency in the care of musculoskeletal injuries and medical conditions encountered in sports. The team physician also must actively integrate medical expertise with other health care providers, including medical specialists, athletic trainers and allied health professionals. The team physician must ultimately assume responsibility within the team structure for making medical decisions that affect the athlete's safe participation.*[30] *[See Appendix C: Team Physician Consensus Statement for qualifications and duties of the team physician]*

[**] ***Certified Athletic Trainer****: An allied health care professional who, upon graduation from an accredited college or university, and after successfully passing the NATABOC certification examination, is qualified to work with individuals engaged in physical activity in the prevention of injuries/illnesses, the recognition, evaluation and immediate care of injuries/illnesses, the rehabilitation and reconditioning of injuries/illnesses, and the administration of this health care system. This individual must have current certification in CPR and be qualified in first aid and blood borne pathogens. Other health care professionals with equivalent certification and/or licensure would also meet this standard.*

Base Health Care Index (Table 1)

The base health care index is founded on the injury risk (IR), and treatment demands associated with those injuries (Tx/I), as the means to determine the base health care needs for each sport. Aggregate injury rate and treatment data reflecting both time loss and non-time loss injuries (across all competitive divisions) comprised the IR and Tx/I, with values representing rates per 1,000 athletic exposures (or opportunity for injury). (See Table 7 for Actual Data Sources.)

IR = Injury Rate: The IR reported for each sport is based on available multi-year sport injury surveillance data. Injury rate is defined as the number of athletic injuries per 1,000 exposures resulting from both time loss and non-time loss (at least one day of missed practice/competition) injuries. Table 7 has been revised to provide the most up to date time loss injury risk data. Table 1 lists the aggregate IR value for each sport based on current injury rate statistics (time loss and non-time loss combined).

Tx/I = Treatments/Injury: The Tx/I is intended to characterize each sport on the basis of time devoted to the ongoing treatment and rehabilitation of the injured student-athlete. This value provides as estimate of the **volume** of care that is required to manage injuries on an ongoing basis and to restore an athlete to full activity after time loss injury. Hence, the Tx/I reflects the average number of reported treatments provided per injury for that particular sport. Tx/I represents the aggregate care provided for both time loss and non-time loss injuries (Powell & Dompier, 2003). Table 1 lists the Tx/I for each sport.

Base HCI: To determine an index of total health care load, IR and Tx/I indices were multiplied to provide an estimate of the relative workload for that sport. Each value was then normalized to a relative 4-point scale, with 0 representing no risk/demand and 4 representing the highest risk/demand. To determine the maximum risk (value of 4), the IR*Tx/I recorded for each sport was divided by the highest IR*Tx/I recorded for any one sport where sufficient representative data was available (i.e. women's basketball).

$$\frac{\text{Aggregate IR*Tx/I}}{\text{528 (= max IR*Tx/I recorded)}} \text{ (x 4) = Base Health Care Index/Sport}$$

Table 1 lists the calculated IR*Tx/I and normalized HCI for each sport.

Adjustments to Base Health Care Index Based on Actual Athlete Exposures (Table 2)

The base HCI is calculated on injury and treatment rates per 1,000 exposures. However, the actual number of athlete exposures (thus injuries encountered) can vary considerably between sports, depending on squad size (# of athletes) and the actual number of days engaged in activity (length of season). In order to accurately reflect the potential injury risk and treatment demands for a particular sport, an estimate of the total athlete exposures for that sport should be calculated.

1. **Calculating Total Athlete Exposures (Column E):** An exposure is one athlete participating in one coach-directed session involving physical activity. Hence, the base HCI must be adjusted for the actual number of athletes and days of activity anticipated for each sport season.

   ***Total Days Engaged in Physical Activity (Table 2, Column C)*:** Depending on competitive division and sport, the number of days athletes are actually engaged in practice and/or competition may differ (e.g. safety exception sports, non-traditional seasons, etc). In order to accurately determine injury risk exposure, an estimate of actual days each sport will be engaged during an average season is needed. This value should reflect both traditional, and where applicable, non-traditional seasons. Skill instruction sessions or other out-of-season activities requiring the presence of an ATC or other health care professional should also be considered, depending on the perceived risk and the number of athletes associated with those activities.

Total Athletes per Sport Team (Table 2, Column D): Injury risk exposure is also based on total number of athletes engaged in any one activity (i.e. team size). While two sports may have similar season lengths, actual athlete exposures will be substantially lower for teams with small squad sizes compared to teams with larger squad sizes.

Calculating Total Athlete Exposures (TAE):

Days Participating (Column C) x # Athletes/Team (Column D) = TAE (Column E)

Examples:

Division 1 football, which allows 105 regular season practice days and 15 days for spring practice, is active a total of 120 days per academic year. If the team roster includes 100 athletes, the total number of athlete exposures is:

120 days X 100 athletes = 12,000 TAE

Women's gymnastics, a safety exception sport, is allowed to participate year round and will have more practice days (144) per academic year. However, given the smaller squad size (e.g. 10 athletes), women's gymnastics will have far fewer total athlete exposures per year:

144 days x 10 athletes = 1,440 TAE

2. **Adjusting Base HCI for Total Exposures (Table 2, Column G):** The actual number of athlete exposures is divided by 1,000 (Column F) to determine the factor by which the base HCI should be multiplied. Since the base HCI is founded on injuries per 1,000 exposure, dividing the actual # of exposures in Column E allows one to calculate the actual "anticipated risk" for that sport. The adjusted HCI (Column G) therefore provides an estimate of health care load for each sport based on the number and severity of injuries one would expect to encounter in a given season.

Formula:

Base HCI (Column B) x TAE/1,000 (Column F) = Adjusted HCI (Column G)

Examples:

If men's football has 12,000 exposures per season that means the number of exposures is 12 times greater than what is reflected in the base HCI. Thus, potential for injury (and associated medical care for those injuries) is 12 times greater. To account for the anticipated volume of injury and treatment for that sport, the following adjustments are made to the base HCI:

3.0 (Base HCI) x 12 (Exposure Modifier) = 36 Adjusted HCI

If women's golf fields 10 athletes, only minor adjustments are needed to the base HCI to account for the actual exposures associated with that sport:

1.0 (Base HCI) x 1.3 (Exposure Modifier) = 1.3 Adjusted HCI

3. **Adjusting HCI for Active Time of Sport Per Year (Column I):** Based on the number of allowable days of activity for each sport, no sport is exposed to the risk of injury represented in the adjusted HCI year round. The health care demands calculated for that sport must primarily reflect what can be expected while the sport is actively engaged in traditional and non-traditional season activities. To appropriately adjust for inactive periods, the HCI is divided by the proportion of the year that the sport is active. For simplicity, this adjustment has been standardized at 50% for the academic year. This standard proportion is based on: (1) a *conservative* estimate of the number of allowable active days for each sport (~120-144 days) in a 10-month athletic calendar (10 months @ 4 weeks x 6 work days/week = 240 days), and (2) the assumption that full-time health care staff are able to care for two high risk sport teams in a given year (providing no significant overlap in seasons exists). Although it can be argued that the treatment of injuries continue throughout the year, the potential for an athlete to sustain an injury is limited to the actual days of activity.

Formula:

Adjusted HCI (Column G) x % of Year (Column H) = Adjusted HCI/Year (Column I)

Other Adjustments Based on Ancillary Staff Responsibilities

1. **Travel:** Traveling with an individual team removes a health care provider from the institution, which reduces the health care resources available to other student-athletes during that time period. This must be accounted for when determining the overall health care provider load. To more accurately reflect the impact of travel on athlete health care, this adjustment has been revised to represent the proportion of anticipated travel days for each staff member in a given academic year. Based on a 12 HCU load per staff member and a 10-month athletic calendar (240 work days), one HCU is assigned for every 20 days of anticipated staff travel per academic year:

Formula:

240 work days per year/12 HCU per staff member = 1 HCU per 20 travel days

5 travel days = .25 HCU
10 travel days = .50 HCU
15 travel days = .75 HCU
20 travel days = 1.00 HCU

** Sandy, did the asterisk this descriptor is for drop off? Do we need to keep it? May include pre-season tournaments and post-season championships as anticipated*

Example (Table 3):

If an ATC travels with women's basketball an estimated 30 days per season, 1.5 HCUs are added to the total health care index for that sport:

4.0 HCI/year (Column I) + 1.5 HCU for travel (Column F) = 5.5 HCU (Column H)

2. **Administrative Duties:** A variety of administrative duties and responsibilities can remove the health care provider from direct athlete care during part of the workday. This time must be accounted for when determining the total health care load of the institution (see Table 2, final totals), as well as the total health care load for each full-time health care provider (i.e., 12 units). Theoretically, if an administrative duty is

assigned a value of 3, that duty should consume approximately 25% of one's time (e.g., 1½ days per week, 1 week per month, etc). As a guideline, the following table is provided:

Formula:

Administrative Duties	Health Care Units
25% of total work time	3 units
16% of total work time	2 units
8% of total work time	1 unit
<8% of total work time	.5 unit

The following list, although not comprehensive, identifies examples of administrative duties to be considered:

- Budget
- Insurance
- Coordination of Student Workers
- Staff Education
- Computer Systems
- Facility Maintenance
- Scheduling
- Purchasing
- Team Travel Arrangements
- Athlete Education
- Pre-participation Physical
- Medical Records and Injury Reporting
- OSHA
- Special Assistance Fund
- Classroom Instruction
- Drug Testing
- Head Athletic Trainer
- Clinical Supervision and Instruction of Athletic Training Students

5. **Other factors:** Additional factors such as the number and location of full-service athletic training facilities, location of practice and competition venues (relative to each other, distance from the athletic treatment facilities), and geographic locale (i.e., distance from emergency medical services/hospital care) may either reduce or increase health care demands. Institutions should consider these factors and make appropriate adjustments in the total health care load, based on sound decisions of how to best handle their individual medical care coverage needs.

Example:

If two venues are within 4 minutes* of each other, one qualified provider (based on the qualifications required for the sport with the highest base unit/risk as defined in the next section) could cover both venues. Individual factors may necessitate adjustments in the sport health care units derived from the system worksheet.

**A 4-minute response time is recommended, as irreversible brain damage will begin within 4-6 minutes after cardiac arrest.*[32, 33]

Recommendations and Guidelines for Health Care Providers

The following recommendations and guidelines are provided to assist institutions in making appropriate decisions for onsite medical coverage of sport activities. These decisions should be based on the potential for serious or catastrophic injury, not on gender, sport profile or level of competition. Hence, primary factors for determining onsite practice of game coverage, and the level of qualifications of the health care member providing that coverage, are overall injury rate and the potential for catastrophic injury for that sport.

IR = Injury Rate Index: The IR Index classifies each sport on the potential for injury, based on the aggregate injury rate values presented in Table 1. The relative risk of each sport (4-point scale rating) is then combined with the risk for catastrophic injury (Table 3).

CI = Catastrophic Index: The CI classifies each sport on the basis of its potential for life-threatening situations, spinal cord injury, major head injury or permanent disability. The catastrophic injury index provides a separate measure for determining the level of qualified medical personnel required at practice and/or competition. Catastrophic injury rates were obtained from the most recent report from the National Center for Catastrophic Sports Injury Research (Mueller and Cantu, 2002; Nineteenth Annual Report, Fall 1982-Spring 2001. http://www.unc.edu/depts/nccsi/AllSport.htm). The relative risk of CI for each sport was then determined by converting these risk values to a 4-point scale using 10 injuries per 100,000 participants (i.e. football) as the highest IR recorded (4) for any one sport (Table 3).

Table 3 lists the IR Index, CI Index and Combined IR+CI Index for each sport.

It is recommended that personnel providing medical coverage of institutionally sponsored athletic activities and treatment facilities possess the following qualifications:

A. All personnel who are associated with medical coverage for intercollegiate sports participation shall be at least minimally qualified as stated in Guideline 1 F-7 of the *NCAA Sports Medicine Handbook* (http://www.ncaa.org/library/sports_sciences/sports_med_handbook/2002-03/)

> "Certification in cardiopulmonary resuscitation techniques (CPR), first aid, and prevention of disease transmission (as outlined by OSHA guidelines) should be required for all athletics personnel associated with practices, competitions, skills instruction and strength and conditioning. New staff engaged in these activities should comply with these rules within six months of employment."

B. Sports that are considered lower risk (combined IR and CI less than 4.0) and sports-related activities that include strength/conditioning, individual skill sessions and voluntary summer workouts must have an individual physically present who possesses the minimum qualifications as specified in A above. Based on the values in Table 3, the following sports are considered to be of low risk:

- Baseball
- Crew (M&W)
- Cross Country (M&W)
- Fencing (M&W)
- Golf (M&W)
- Outdoor Track (M&W)
- Softball
- Swimming (M&W)
- Tennis (M&W)
- Water Polo (M&W)

C. Sports with moderate risk (combined IR and CI of 4.0 - 5.0 **or** CI of 3.0) should have a certified athletic trainer, or other designated person with the designated minimal qualifications (Recommendation A), physically present. If no ATC is present, a certified athletic trainer must be able to respond within 4 minutes. Based on the values in Table 3, the following sports are considered to be of moderate risk:

- Basketball (W)
- Diving (M&W)
- Field Hockey
- Indoor Track (M&W)
- Lacrosse (M&W)
- Soccer (M&W)
- Volleyball (M&W)

D. Sports with increased risk (combined IRE and CI of 6.0 or greater **or** CI of 4.0) should have a certified athletic trainer physically present for all practices. Based on the values in Table 3, the following sports are considered to be of increased risk:

- Basketball (M)
- Football
- Gymnastics (M&W)
- Ice Hockey (M&W)
- Skiing
- Wrestling

E. Any sport with a combined IR and CI of 3.0 or greater should have a certified athletic trainer physically present during all home competitions. *While the task force encourages the physical presence of certified athletic trainers at all home competitions*, competition coverage of sports with lower unit values (e.g., golf, outdoor track) will be left to institutional discretion.

F. A certified athletic trainer must directly supervise all full-service athletic training facilities during institution-declared hours of service.

G. Visiting teams and athletes shall be provided with equitable access to health care.

H. NATA supports the implementation of NCAA guideline that states each institution shall have a venue-specific emergency care plan in place that includes: (1) the presence of a person qualified and designated to provide emergency care, (2) planned access to a physician and/or emergency medical facility when warranted, including a plan for communication and transportation between the athletic venue and the medical facility, 3) appropriate and necessary emergency care equipment onsite that is quickly accessible, 4) an inclement weather policy that includes specific provisions for decision-making and evacuation plans, and 5) a thorough understanding of the personnel and procedures associated with the plan by all individuals, including administrators, coaches, visiting team representatives and health care personnel (*NCAA Sports Medicine Handbook*; http://www.ncaa.org/library/sports_sciences/sports_med_handbook/2002-03/). Institutions are encouraged to consult the NATA emergency care plan position statement for detailed guidelines to assist in implementation (Anderson et al, 2002).

Conclusion

The health and safety of the student-athlete should be paramount to all involved in sports at the collegiate level. In an effort to safeguard the student-athlete, the National Athletic Trainers' Association has issued these recommendations as guidelines to provide appropriate medical coverage. While these recommendations represent an appropriate level of care, institutions of all sizes and/or divisions are encouraged to provide enhanced care as consistent with the stated philosophy of their institution.

Reference:

Anderson JC, Courson RW, Kleiner DM, McLoda TA. National Athletic Trainers' Association Position Statement. Emergency Planning in Athletics. *Journal of Athletic Training*. 37(1): 99-104, 2002.

APPENDIX A

System Worksheet and Narrative

Application of the Health Care Unit System

NATA's Recommendations and Guidelines for Appropriate Medical Coverage of Intercollegiate Athletics (Revised) offer college and university health care providers a system by which they can evaluate their current level of coverage for student-athletes. These recommendations have been created for the safety of student-athletes competing at the collegiate level. To that end, certified athletic trainers in these settings must have a thorough understanding of the recommendations before implementing the system.

Constants: The following remain constant throughout the system regardless of the size of your program or the level of competition:

- The estimated health care load for one ATC is 12 health care units (HCU). However, the institution may adjust this.
- Each sport has an assigned base Health Care Index (HCI) value derived from injury rates (IR) for both time loss and non-time loss injuries, and the treatments associated with those injuries (Table 1).
- Each sport has an assigned base HCI value to represent the risk of catastrophic injury (Table 3).
- Full-service athletic training rooms should have a certified athletic trainer present during institution-declared hours of operation.

Variables: Variable items affecting HCU totals that can be added (or omitted) at the discretion of the institution are:

- Travel
- Administrative Duties

Consider using these variables as negotiation points. For instance, after having applied the system at your institution, you determine that two additional ATCs (24 health care units) are needed in order to deliver appropriate medical coverage. Your administrator states that, at this time, you will only receive one additional staff member. You can suggest reducing the length/vigor of non-traditional seasons, reducing squad size, eliminating travel requirements or reassigning time-consuming administrative duties to other areas. This would reduce total health care units, thus ensuring appropriate medical coverage.

Application of the System

1. The Health Care Index for each sport is listed on the System Worksheet (Table 4), which will be used to calculate the total health care needs of your institution. Disregard those sports not offered at your institution. (Refer to Table 2 for the examples provided.)

2. The load for an institution is not only based on the sports offered and their respective HCI, but on the actual athlete exposures, which is a function of squad size and the number of practice/competitions. In Column C place the number of days (practices/competitions) for a given team. This number should reflect the number of days team members are active, both during the traditional and non-traditional seasons. (Depending on the perceived risk of injury, institutions may also wish to account for skill instruction sessions). In Column D place the number of athletes on the roster for that team. Column E represents the total number of athlete exposures for a sport, which is derived by multiplying exposures (Column C) by the number of athletes (Column D).

> ***Example***:
>
> *Women's soccer practices/competes for 132 days (based on allowable traditional + non-traditional practice days for NCAA Division I soccer) and has 30 athletes. Therefore, women's soccer has 3,960 total exposures*

3. Next, divide the total exposures (Column E) by 1,000 to obtain the exposure modifier and then place this value in Column F.

> ***Example:***
>
> *From above, women's soccer has 3,960 total exposures, so the modifier is 3.96 when divided by 1,000 (rounded to 4.0 in the Sample Worksheet).*

4. The value in Column E now represents the HCI modifier for that sport at that institution. The value in Column F is then multiplied by the HCI in Column B to calculate the actual health care load for that sport. The institution adjusted HCI value is then placed in Column G.

> ***Example:***
>
> *The exposure modifier for women's soccer from Column F is 4.0. This means that 4 times the number of exposures will actually occur in this sport than what is calculated in the base HCI. The base HCI for women's soccer (Column B) is therefore multiplied by this value (Column F), to obtain the adjusted HCI for that sport (2.6 x 4.0 =13.9). This value is then placed in Column G.*

5. Because the number of allowable participation days prevents sports from being actively engaged throughout the entire year, the unit values in Column G are too high to reflect the true health care demands of that sport. The assumption is made that the health care professional is providing care for that sport's athletes for half of the year. Therefore, the value in Column G is divided by 50% (Column H) resulting in a new adjusted HCI/year (Column I). (The proportion in Column G should be adjusted by individual institutions if they anticipate that the sport will be activity engaged more or less than 50% of the year.)

***Example**:*

Continuing with our example, women's soccer has an adjusted HCI of 13.9. Half of 13.9 is 6.9 HCI/year.

6. The last adjustment for each sport is to add in anticipated travel responsibilities. One (1) unit is assigned for every 20 days of travel or a portion thereof.

The adjusted HCI/year for women's soccer is 6.9. The team travels 20 days, so the new value for women's soccer is 7.9

7. Add all adjusted health care units (Column K) to determine a SUBTOTAL of health care units for the institution.

8. Next list administrative duties carried out by the health care staff and assign each a value based on the time requirement for that duty. Remember, for an administrative duty to receive 3 units, it must account for 25% of the ATC's total work time in a given year. (1 unit = 8.33%)

9. Add all administrative units together.

10. Add the administrative units to the to health care unit subtotal. This number represents the TOTAL health care units expended by the institution.

11. Divide the total health care units by 12 (the recommended allowable load for one ATC). This value represents the number of full-time ATC equivalents needed to provide appropriate medical coverage for student-athletes at the institution.

Table 1: Base Health Care Index by Sport

Sport	IR	TX/I	IR*TX/I	HCI
Baseball	19.3	11.5	222	1.7
Basketball-M	29.3	11.0	322	2.4
Basketball-W	32.4	16.3	528	4.0
Crew-M	7.2	12.9	93	0.7
Crew-W	22.0	13.0	286	2.2
Cross Country-M	21.7	8.6	187	1.4
Cross Country-W	23.7	9.4	223	1.7
Fencing-M	15.7	16.2	254	1.9
Fencing-W	24.1	12.6	304	2.3
Field Hockey	34.8	10.8	376	2.8
Football	42.5	9.7	412	3.1
Golf-M	6.5	9.8	64	0.5
Golf-W	13.8	11.0	152	1.2
Gymnastics-M	29.0	16.8	487	3.7
Gymnastics-W†	48.1	27.9	1342	4.0
Ice Hockey-M	33.9	7.2	244	1.8
Ice Hockey-W	12.3	10.7	132	1.0
Indoor Track-M	31.9	11.4	364	2.8
Indoor Track-W	32.3	11.8	381	2.9
Lacrosse-M	23.9	10.0	239	1.8
Lacrosse-W	27.9	11.8	329	2.5
Outdoor Track-M	18.3	8.0	146	1.1
Outdoor Track-W	21.1	7.1	150	1.1
Soccer-M	35.0	10.7	375	2.8
Soccer-W	42.3	11.2	474	3.6
Softball	28.1	10.7	301	2.3
Swim & Diving -M	12.8	7.6	97	0.7
Swim & Diving-W	15.5	9.5	147	1.1
Tennis-M	21.7	9.3	202	1.5
Tennis-W	24.5	10.7	262	2.0
Volleyball-M†	35.0	22.7	795	4.0
Volleyball-W	36.8	12.6	464	3.5
Water Polo-M	12.0	18.3	220	1.7
Water Polo-W	22.2	7.9	175	1.3
Wrestling	41.8	9.1	380	2.9

†To determine the maximum risk (value of 4), the IR*Tx/I recorded for each sport was divided by the highest IR*Tx/I recorded for any one sport where sufficient representative data was available (i.e., women's basketball). Sports indicated by an (†) recorded higher IR*Tx/I, but were based on limited data.

Table 2: Sample Worksheet – Adjustments to Base Health Care Index

A	B	C	D	E	F	G	H	I	J	K
Sport	**Base HCI (Table 1)**	**#Days/ Season†**	**#Athletes/ Team**	**Total Athlete Exposures (C*D)**	**Exposure Modifier (E/1,000)**	**Adjusted HCI (B*F)**	**% of Year**	**Adjusted HCI/Yr**	**Travel (20 days = 1 HCU)**	**Admin Duties**
Baseball	1.7	132	30	3960	4.0	6.7	50%	3.3	1.5	
Basketball – M	2.4	132	15	1980	2.0	4.8	50%	2.4	1.5	
Basketball – W	4.0	132	15	1980	2.0	7.9	50%	4.0	1.5	
X-Country – M	1.4	144	10	1440	1.4	2.0	50%	1.0		
X-Country – W	1.7	144	10	1440	1.4	2.4	50%	1.2		
Field Hockey	2.8	132	25	3300	3.3	9.4	50%	4.7		
Football	3.1	120	100	12000	12.0	37.5	50%	18.7	0.5	
Gymnastics – W	4.0	144	10	1440	1.4	5.8	50%	2.9	0.5	
Lacrosse – M	1.8	132	30	3960	4.0	7.2	50%	3.6	0.5	
Outdoor Track - M	1.1	132	40	5280	5.3	5.9	50%	2.9		
Outdoor Track - W	1.1	132	40	5280	5.3	6.0	50%	3.0		
Rowing – M	0.7	132	50	6600	6.6	4.6	50%	2.3		
Soccer – M	3.6	132	30	3960	4.0	11.2	50%	5.6	1.0	
Soccer – W	2.8	132	30	3960	4.0	14.2	50%	7.1	1.0	
Softball	2.3	132	25	3300	3.3	7.5	50%	3.8	1.5	
Volleyball – W	3.5	132	15	1980	2.0	7.0	50%	3.5	1.0	
Wrestling	2.9	132	30	3960	4.0	11.4	50%	5.7	0.5	
TOTALS								**75.8**	**11.0**	

TOTAL HEALTH CARE UNITS **87**
(Add all units in Column I-K)

TOTAL FULL TIME ATCs
(Total Heath Care Units) **7.25**
12

†Figures represent total number of allowable practice days for both in and out of season for NCAA Division I. Individual institutional values should be adjusted based on competitive level and the extent of both traditional and non-traditional season activities.

Table 3. Injury and Catastrophic Risk Indices for Medical Coverage

Sport	CI Index (Table 11)	IR Index (Table 1&7)	CI + IR	Coverage Category
Baseball	1	2	3	B
Basketball-M	3	3	6	D
Basketball-W	1	4	5	C
Crew-M	1	1	2	B
Crew-W	1	2	3	B
Cross Country-M	1	2	3	B
Cross Country-W	1	2	3	B
Fencing-M	1	2	3	B
Fencing-W	1	2	3	B
Field Hockey	1	3	4	C
Football	4	4	8	D
Golf-M	1	1	2	B
Golf-W	1	1	2	B
Gymnastics-M	4	4	8	D
Gymnastics-W	4	4	8	D
Ice Hockey-M	4	2	6	D
Ice Hockey-W	4	1	5	C
Indoor Track-M	1	3	4	C
Indoor Track-W	1	3	4	C
Lacrosse-M	3	2	5	C
Lacrosse-W	1	3	4	C
Outdoor Track-M	1	1	2	B
Outdoor Track-W	1	1	2	B
Soccer-M	1	3	4	C
Soccer-W	1	4	5	C
Softball	1	2	3	B
Swimming-M	2	1	3	B
Swimming-W	1	2	3	B
Tennis-M	1	2	3	B
Tennis-W	1	2	3	B
Volleyball-M	1	4	5	C
Volleyball-W	1	4	5	C
Water Polo-M	2	1	3	B
Water Polo-W	1	2	3	B
Wrestling	2	4	6	D

Table 4: System Worksheet - Adjustments to Base Health Care Units

A	B	C	D	E	F	G	H	I	J	K
Sport	**Base HCI (Table 1)**	**# Days/ Season**	**# Athletes/ Team**	**Total Athlete Exposures (C*D)**	**Exposure Modifier (E/1,000)**	**Adjusted HCI (B*F)**	**% of Year**	**Adjusted HCI/Yr**	**Travel (20 days = 1 HCU)**	**Final Adjusted HCU (I + J)**
Baseball	**1.6**									
Basketball-M	**2.4**									
Basketball-W	**4.0**									
Cheerleading										
Crew-M	**0.7**									
Crew-W	**2.1**									
Cross Country-M	**1.4**									
Cross Country-W	**1.6**									
Fencing-M	**1.9**									
Fencing-W	**1.2**									
Field Hockey	**2.8**									
Football	**3.0**									
Golf-M	**0.5**									
Golf-W	**1.1**									
Gymnastics-M	**3.8**									
Gymnastics-W	**4.0**									
Ice Hockey-M	**1.9**									
Ice Hockey-W	**0.9**									
Indoor Track-M	**2.7**									
Indoor Track-W	**2.8**									
Lacrosse-M	**1.8**									
Lacrosse-W	**2.5**									
Novice Crew	**1.9**									
Outdoor Track-M	**1.1**									
Outdoor Track-W	**1.1**									
Soccer-M	**2.6**									
Soccer-W	**3.5**									
Softball	**2.2**									
Swimming-M	**0.7**									
Swimming-W	**1.1**									
Tennis-M	**1.5**									
Tennis-W	**1.9**									
Volleyball-M	**4.0**									
Volleyball-W	**3.4**									
Water Polo-M	**1.6**									
Water Polo-W	**1.3**									
Wrestling	**2.8**									
					Total Health Care Units (Add Column K)					
					Add Administrative Units					
					Total Units					
					Total ATCs (Total Units ÷ 12)					

Table 7 (Revised 3/03). Comparative Multi-Sport Injury Rate Data (indicates the number of time loss injuries per 1,000 athlete exposures)

Sport	NCAA ISS (~1985-2002) Practice	NCAA ISS (~1985-2002) Game	NCAA ISS Aggregate Injury Rate†	Big Ten Conference (1995-2000)	AMCIA 2 Year Study (2000-2002)	Time Loss Injury Rate (Combined)
Baseball	2.1	6.1	3.2	4.9	3.5	3.9
Basketball - M	4.6	9.2	5.5	5.0	6.0	5.5
Basketball - W	4.4	10.0	5.6	3.7	6.1	5.1
Crew - M					1.4	1.4
Crew - W					4.7	4.7
Cross Country - M					3.8	3.8
Cross Country - W					3.3	3.3
Cheerleading						
Diving						
Fencing - M					4.8	4.8
Fencing - W					6.2	6.2
Field Hockey	4.1	8.5	5.0	4.4		4.7
Football	4.1	36.0	6.7	9.5	9.8	8.7
Football (Spring)	9.5	19.3	10.5			10.5
Golf – M					1.9	1.9
Golf – W					2.5	2.5
Gymnastics - M	5.5	5.5	5.5	5.9	8.9	6.8
Gymnastics - W	7.5	18.5	8.4	6.4	8.5	7.8
Ice Hockey - M	2.2	17.6	5.9		8.6	7.3
Ice Hockey - W	2.8	13.6	5.6		4.1	4.9
Indoor Track – M					5.2	5.2
Indoor Track – W					4.1	4.1
Lacrosse - M	3.7	14.6	5.5		7.6	6.6
Lacrosse - W	3.6	7.5	4.3		5.1	4.7
Outdoor Track – M					3.7	3.7
Outdoor Track – W					3.1	3.1
Skiing - M						
Skiing - W						
Soccer - M	4.7	20.2	7.8	4.8	7.7	7.8
Soccer - W	5.7	17.6	8.3	5.4	6.4	7.4
Softball	3.2	4.9	3.9	3.3	4.1	3.8
Swimming - M					1.6	1.6
Swimming - W					2.1	2.1
Tennis - M					2.6	2.6
Tennis - W					4.2	4.3
Volleyball - M					7.5	7.5
Volleyball - W	4.5	4.8	4.6	2.9	4.2	4.4
Water Polo - M					2.3	2.3
Water Polo - W					1.5	1.5
Wrestling	6.9	29.7	9.4	9.3	9.0	9.3

NCAA ISS data based on injuries recorded from the start of individual sport surveillance through the 2001-02 seasons (http://www1.ncaa.org/membership/ed_outreach/health-safety/iss/index.html). Big Ten data based on time loss injuries recorded from 1995-96 through 1999-2000 seasons (Big Ten Conference, Sports Medicine Committee). AMCIA data based on the time loss and non-time loss injuries recorded for the 2000-01 through 2001-02 seasons (Powell & Dompier, In Review). †Aggregate NCAA injury rate for combined practice and games represent the weighted average (percentage of total exposures) of injuries attributed to practice vs. game. Proportions were calculated based on a representative season for that sport.

Table 11 (Revised 3/03). Catastrophic Index Based on Catastrophic Injury Rate Data by Gender and Sport. The CI Rate was converted to a 4-point scale by dividing each CI Rate by 10, then multiplying by a factor of 4 and rounding up to nearest full digit.

Sport	Injury Rate/ 100,000 Participants†	(IR/10)*4	AMCIA CI Index
Baseball	2.38	1.0	1
Basketball - M	7.68	3.1	3
Basketball - W	.44	0.2	1
Cross Country - M	.53	0.2	1
Cross Country - W	.00	0.0	1
Cheerleading‡	N/A	<4.0	4
Diving‡	3.23	1.3	2
Fencing	N/A		1
Field Hockey	1.87	0.7	1
Football	9.60	3.8	4
Golf – M	N/A		1
Golf – W	N/A		1
Gymnastics - M	31.00	<4.0	4
Gymnastics - W	10.40	<4.0	4
Ice Hockey - M	17.50	<4.0	4
Ice Hockey - W	12.39	<4.0	4
Lacrosse – M	6.08	2.4	3
Lacrosse – W	1.54	.62	1
Rifle	N/A		1
Rowing – M	N/A		1
Rowing – W	N/A		1
Skiing – M	7.54	3.0	3
Skiing – W	9.82	3.9	4
Soccer – M	1.70	.68	1
Soccer – W	.57	.23	1
Softball	.00	0	1
Swimming - M	3.23	1.3	2
Swimming - W	.00	0	1
Tennis – M	.68	.28	1
Tennis – W	.69	.28	1
Track – M (Indoor/Outdoor)	1.37	.55	1
Track – W (Indoor/Outdoor)	.22	.10	1
Volleyball - M	.00	.00	1
Volleyball - W	1.16	.46	1
Water Polo - M	5.21	2.2	3
Water Polo - W	.00	.00	1
Wrestling	3.01	1.2	2

†Data obtained from the most recent study of Mueller and Cantu[24] on athletes participating in college sports. Number of participants reflects the cumulative total number of participants since tracking began respective for each sport.
‡Cheerleading numbers are based on like sport (gymnastics) and diving ratings were derived from the pooled data of men's swimming.