

The National Sports Safety in Secondary Schools Benchmark (N4SB) Study: Defining Athletic Training Practice Characteristics

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Context: Increased rates of sport participation and sport-related injury have led to greater emphasis on and attention to medical care of student-athletes in the secondary school setting. Access to athletic training services is seen as a critical factor for delivering adequate injury prevention and medical care to student-athletes. However, few data are available regarding practice characteristics of athletic trainers (ATs) in this setting.

Objective: To characterize the practices of secondary school athletic trainers (ATs).

Design: Descriptive study.

Setting: Web-based survey.

Patients or Other Participants: A total of 17 558 ATs with current National Athletic Trainers' Association membership were identified for survey distribution. Of these, 4232 ATs indicated that they practiced in the secondary school setting, and 4045 completed some part of the survey.

Main Outcome Measure(s): A Web-based survey was used to obtain demographic information about ATs and their secondary schools and characteristics of athletic training practice. Descriptive data regarding the athletic trainer's personal characteristics, secondary school characteristics, and practice patterns are reported as percentages and frequencies.

Results: Most respondents were in the early stages of their careers and relatively new to the secondary school practice setting. Nearly two-thirds (62.4%; $n = 2522$) of respondents had 10 or fewer years of experience as secondary school ATs, 52% ($n = 2132$) had been certified for 10 or fewer years, and 53.4% ($n = 2164$) had 10 or fewer years of experience in any practice setting. The majority of respondents (85%) worked in public schools with enrollment of 1000 to 1999 (35.5%) and with football (95.5%). More than half of respondents were employed directly by their school. Most respondents (50.6%) reported an athletic training budget of less than \$4000. The majority of ATs performed evaluations (87.5%) on-site all of the time, with a smaller percentage providing treatments (73.3%) or rehabilitation (47.4%) services all of the time.

Conclusions: This is the first study to describe secondary school athletic training that reflects national practice trends. To improve the quality of athletic training care and to support and improve current working conditions, the profession must examine how its members practice on a day-to-day basis.

Key Words: professional practice, adolescents, care standards, health care accessibility

Key Points

- The findings of this study portray the secondary school athletic trainer as a relatively young, early- to mid-stage provider, working alone, and typically supervised by a non-health care provider.
- Approximately one-third of respondents had either no athletic training budget or a budget of less than \$2000, which may not be appropriate to facilitate adequate patient care.
- Practice characteristics vary, with most secondary school athletic trainers performing evaluations on site all of the time, but with a much smaller percentage providing treatments or rehabilitation services all of the time.

Sport participation rates among secondary school students in the United States have consistently increased over the past 20 years, with more than 55% of secondary school students now taking part in interscholastic athletics.¹ Accompanying the increased number of participants is an increased number of sport-related injuries, which total around 2 million annually.² These high numbers of injuries affect the health and well-being of student-athletes³ and have significant financial effects on the public and on the national health care system.^{4,5} However, the effect of sport-related injuries may

be lessened through injury-control interventions, prompt injury assessments and treatments, and proper referrals.⁶

Increased sport participation and sport-related injury incidence has led to greater emphasis on and attention to medical care of student-athletes in the secondary school setting. The health care professionals best positioned to provide effective and efficient medical care to secondary school student-athletes are athletic trainer (ATs), who optimize the activity of patients and athletes under the direction of physicians. Athletic training encompasses the prevention, diagnosis, and treatment and rehabilitation of emergency, acute, and chronic medical conditions involving

impairments, functional limitations, and disabilities.⁷ The American Medical Association supported ATs' provision of daily medical care for secondary school athletes in its resolution that organizations sponsoring athletic programs, including secondary schools, should have established medical care.⁸ In addition, recent trends in sport safety legislation at the state level, including concussion-management laws, clearly account for the important role of ATs in evaluation and management of these injuries.

Additionally, the "Appropriate Medical Care for the Secondary School-Aged Athlete" consensus statement⁶ made specific recommendations as to what constitutes appropriate medical care and recognized ATs as educated and qualified members of the health care team to serve as on-site personnel providing daily care. These recommendations laid a framework for secondary schools to establish or improve health care for student-athletes. Currently, ATs are estimated to work in approximately 40% of US secondary schools,⁹ but Florida and Wisconsin have reported ATs in as many as 79% and 86% of secondary schools, respectively.^{10,11}

Limited research has characterized the practice of ATs employed in any practice setting, including secondary schools, and even fewer authors have examined the factors that influence that practice. In probably the most thorough example to date, Wham et al⁵ examined factors associated with better medical care in South Carolina and identified athletic training services (the presence of an AT, number of ATs, and source of athletic training employment) and sports medicine supply budget as the best predictors of improved health care. However, data describing athletic training in the secondary school setting are lacking, offering little insight into how to improve care for this vulnerable patient population. Gaining a clear understanding of secondary school athletic training practices, including the structural and organizational factors that positively and negatively influence practice, should establish effective, setting-specific practice benchmarks from which best practices can be established.¹²

Partly in response to this need, the National Athletic Trainers' Association (NATA) commissioned the NATA National Sport Safety in Secondary Schools Benchmark (N4SB) Project to determine, on a state-by-state basis, the access that secondary school student-athletes have to athletic training services and what those services entail. Access to athletic training services is seen as a critical factor for delivering adequate injury prevention and medical care to student-athletes, thereby promoting sport safety. The purpose of this paper is to characterize the practice of secondary school athletic trainers (SSATs) by drawing on data generated by the N4SB Project.

METHODS

Participants

The goal of survey distribution was to reach all ATs who worked in the secondary school setting. One week before survey distribution, we obtained AT contact lists from the NATA via e-mail. Contact lists included NATA members whose membership profiles identified their work setting as one of the following: clinic, hospital, military/law enforcement, secondary school, or other. This range of settings was

used to ensure that the survey reached all ATs who worked in the secondary school setting by accounting for various outreach employment models, which are not directly accounted for in the NATA database. As a result, 17 558 ATs with current NATA membership were identified for survey distribution. In spite of the scope of this survey-distribution effort, limitations occurred due to possible categorization errors in the NATA distribution lists and because non-NATA-member ATs were not included. The study was approved by the A.T. Still University Institutional Review Board, and completion of the survey was deemed consent to participate.

Instrumentation

To assess the demographic and practice characteristics of SSATs, we developed a survey based on previous work by the NATA's Secondary School Athletic Trainers' Committee. After reviewing and revising the survey to ensure readability, we asked a focus group of SSATs to evaluate the survey for face validity. The final N4SB survey was subdivided into 3 distinct areas: (1) AT demographics (10 questions), (2) secondary school demographics (14 questions), and (3) athletic training practice characteristics (22 questions).

Questions within the AT demographic section asked for information about the respondent's sex, age, title, education, years certified, licensure status, years worked in any athletic training setting, years worked in a secondary school, and whether the individual held other credentials or certifications in addition to AT certification. Questions in the secondary school demographic section included school location, the number of ATs employed at the school, grade levels at the school, type of school (eg, public, parochial), school enrollment, whether the school sponsored football, number of girls' and boys' varsity and nonvarsity sports, number of athletes, and number of coaches. The athletic training practice characteristics section was composed of questions that addressed the mechanism to purchase athletic training supplies, the athletic training budget, the specialty of the AT's supervising or team physician, services provided by the supervising or team physician, whether the school provided the AT with malpractice insurance, and whether the AT purchased additional malpractice liability insurance. Furthermore, respondents were asked the status of their position (eg, full time, part time), who funded the majority of their salary (eg, school, clinic), whether they had teaching responsibilities, and which function (teaching or athletic training) funded most of their salary. Last, specific medical care questions included the frequency of practice and game coverage, travel, on-site evaluation, treatment and rehabilitation, hours worked, and immediate supervisor.

Procedures

Standard e-mails were sent on a state-by-state basis to the addresses provided in the NATA distribution lists with an invitation to participate in the N4SB study. Individuals whose listings did not provide a state affiliation were sent an e-mail invitation independent of state affiliation. After the invitation e-mail, several strategies were used to advertise and encourage survey participation, including (1) promotion by NATA via the *Range of Motion* electronic newsletter, (2)

e-mail solicitation seeking assistance from district directors and the NATA Secondary School Athletic Trainers' Committee, and (3) announcements at the 2010 NATA annual meeting and clinical symposia. A total of 17 558 ATs were initially invited to participate. A follow-up reminder e-mail was sent 2 weeks after the initial invitation.

Statistical Analyses

Aggregate data from all responses were analyzed. Descriptive analyses (percentages and frequencies) for each question within the 3 main survey areas (AT demographics, secondary school demographics, and practice characteristics) were conducted.

RESULTS

Response Rate

We attempted to contact 17 558 ATs in the initial state-by-state e-mails. Approximately 300 e-mails were returned as undeliverable. A total of 4825 ATs accessed the survey (response rate = 28.0%). Of those responding, 593 did not practice in any capacity in the secondary school setting and did not complete the survey; 4232 ATs practiced in the secondary school setting. No substantive information was provided by 187 and so they were excluded from further analysis, leaving 4045 individuals who completed some part of the survey. The number of respondents for each part of the survey is illustrated in Figure 1.

AT Demographics

Male ATs accounted for 51.1% (n = 2065) of the respondents. The average age of the AT was 35.7 ± 9.9 years. Most respondents (55.4%, n = 2240) had completed a master's degree, whereas 41.3% (n = 1672) had a 4-year college degree and 3.3% (n = 133) held other degrees (including doctoral or professional degrees).

The primary job title for 69.6% (n = 2817) of respondents was head AT, followed by other (18%, n = 727), assistant AT (8.2%, n = 330), associate AT (2.6%, n = 104), and graduate assistant AT (1.7%, n = 67). Ninety-one percent (n = 3682) were licensed or regulated in their state. The response counts and percentages for various measures of experience, including years certified, years working as an AT, and years in the secondary school setting, are provided in Figure 2.

Approximately 48% (n = 1916) of respondents held only the certified AT credential; 28.2% (n = 1133) also held a teaching certificate, 10.5% (n = 423) had the CSCS credential, and 5.0% (n = 203) were emergency medical technicians (EMTs). All other certifications or credentials were held by fewer than 5% of the respondents.

Secondary School Setting Demographics

Most of the secondary schools represented included grades 9 through 12 (77.2%, n = 3124) and were public (73.5%, n = 2975). Private or parochial schools accounted for 12.0% (n = 487) of responses, and charter schools (public and private) comprised 3.1% (n = 125) of the sample, with 2.2% (n = 89) indicating *other* and 9.1% (n = 369) providing no response. The response counts and

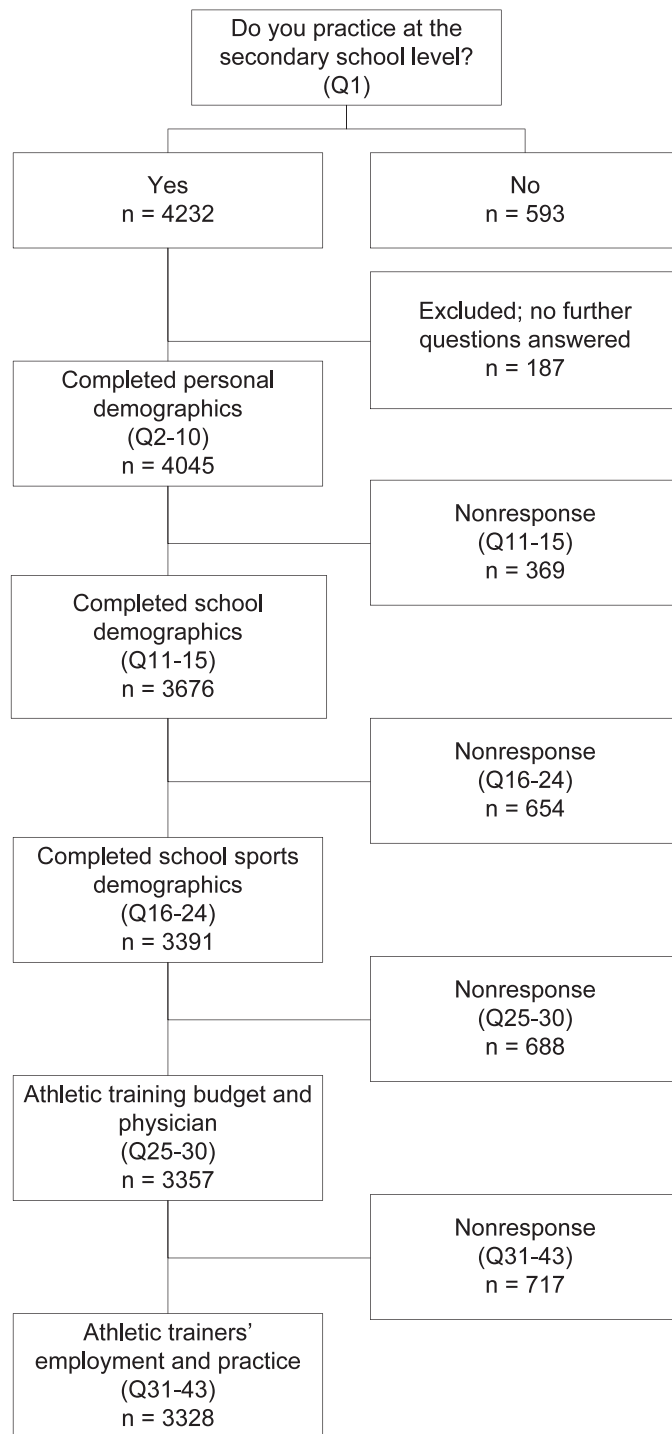


Figure 1. Sample responses. Q indicates survey question number.

percentages by school enrollment are shown in Figure 3. Most respondents reported that their school had football as an interscholastic sport (80.3%, n = 3252).

Counts and percentages for the numbers of sports for both boys and girls at the varsity and nonvarsity levels are displayed in Table 1. Of respondents, 35% (n = 1437) reported 200 to 399 male athletes; 26.2% (n = 1061), fewer than 200 male athletes; 15.1% (n = 609), 400 to 599 male athletes; and approximately 7% (n = 284), more than 600 male athletes. No response was received from 16.2% (n = 654). For girls' sports, 34.3% (n = 1386) of respondents

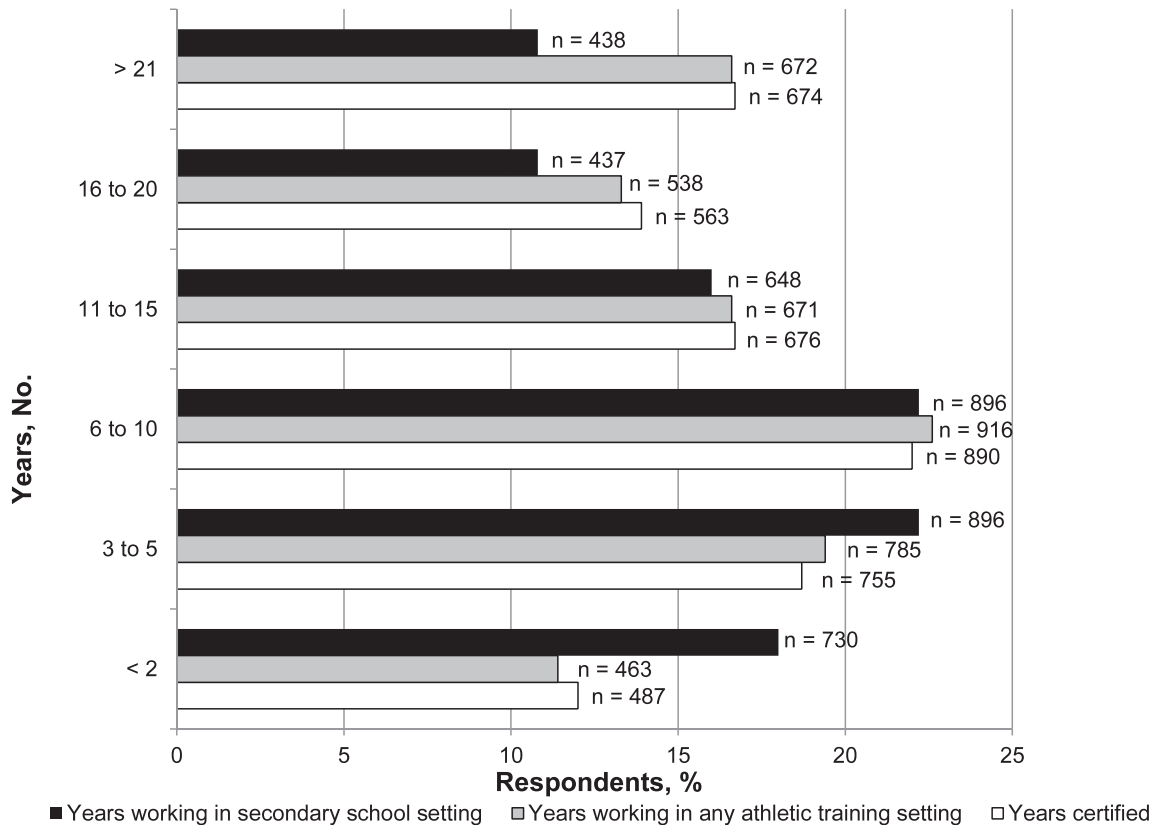


Figure 2. Distribution of respondents' experiences in athletic training.

reported 200 to 399 athletes; 34.2% (n = 1385), fewer than 200 athletes; 10.6% (n = 427), 400 to 599 athletes; and 4.7% (n = 193), more than 600 female athletes. No response was received from 16.2% (n = 654). Counts and percentages of schools employing differing numbers of boys' and girls' coaches are given in Figure 4.

Athletic Training Practice Characteristics

Athletic Training Budget. Most respondents purchased supplies through a budget or bid mechanism (57.0%; n = 2304), with 21.5% (n = 871) obtaining supplies by request or as needed, 2.0% (n = 81) receiving supplies by other

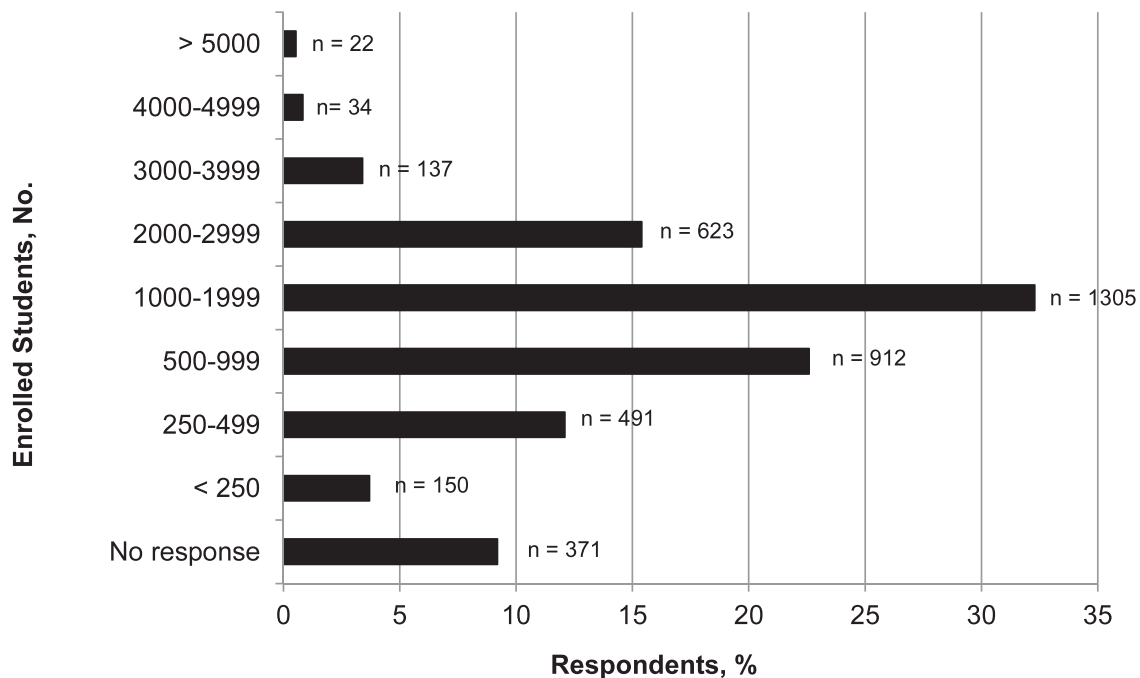


Figure 3. Distribution of respondents' school enrollments.

Table 1. Sports Covered by Respondents, % (No.)

| Number of Sports Covered | Boys' Varsity | Boys' Nonvarsity | Girls' Varsity | Girls' Nonvarsity |
|--------------------------|---------------|------------------|----------------|-------------------|
| 0 | 1.4 (56) | 1.9 (78) | 2.0 (80) | 2.7 (110) |
| 1-4 | 1.7 (69) | 7.7 (311) | 2.9 (118) | 9.1 (389) |
| 5-9 | 36.8 (1489) | 34.4 (1390) | 39.1 (1581) | 35.6 (1441) |
| 10-14 | 37.8 (1529) | 27.7 (1120) | 34.4 (1391) | 26.1 (1056) |
| 15-19 | 4.6 (188) | 7.0 (284) | 4.3 (174) | 5.8 (235) |
| >20 | 1.5 (60) | 5.1 (208) | 1.2 (47) | 4.0 (160) |
| No response | 16.2 (654) | 16.2 (654) | 16.2 (654) | 16.2 (654) |
| Total | 100 (4045) | 100 (4045) | 100 (4045) | 100 (4045) |

mechanisms, and 2.5% (n = 101) reporting no mechanism for purchasing supplies. No response was received from 17% (n = 688). The reported athletic training annual budget categories are detailed in Table 2.

Nature of Position. The majority of respondents were directly employed by their schools in full-time positions (47.1%; n = 1906); 14.0% (n = 568) had an athletic training outreach position, in which employment was through a clinic or other nonschool entity. A total of 10.2% (n = 411) were employed part time at the school, 7.3% (n = 297) were in an outreach position at the secondary school full time, and 3.6% (n = 145) indicated another employment scenario. No response was received from 17.8% (n = 718). The school or school district was the most common source of most of the AT's salary (45.2%; n = 1829), followed by clinics (18.5%; n = 749), hospitals (17.2%; n = 20.9), physicians' offices (1.9%; n = 75), graduate assistantships (0.8%; n = 33), and other (2.9%; n = 116). No response was received from 13.6% (n = 549). Approximately 65.1% (n = 2634) of respondents indicated that the athletic director was their direct supervisor.

Approximately 22.8% (n = 924) of respondents had teaching responsibilities at the school. Of those cases, teaching comprised most of the AT's salary in 62.7% (n = 579), athletic training duties provided the majority of the salary in 33.5% (n = 310), and teaching and athletic training service were divided equally in 7.0% (n = 65). In their roles as ATs (not including classroom time) each week, 31.5% (n

= 1047) worked 20 to 30 hours, 24.4% (n = 812) worked 31 to 40 hours, 18.6% (n = 620) worked 41 to 50 hours, 8.7% (n = 291) worked more than 50 hours, and 16.8% (n = 558) worked fewer than 20 hours. A breakdown of hours worked per week by those with and without teaching responsibilities is available in Figure 5.

Coverage. The counts and percentages of responses for questions regarding game and practice coverage are shown in Table 3. Close to 72% (n = 2877) of respondents traveled to cover away football games some or all of the time, and only 3.5% (n = 141) never traveled to cover football. Forty-five percent (n = 1841) of respondents traveled to nonfootball events but only for playoff games, 15.6% (n = 634) traveled to regular season and playoff games, and 21.1% (n = 853) did not travel at all to nonfootball events.

Clinical Practice. The counts and percentages of responses for ATs providing evaluation, rehabilitation, and treatment services are illustrated in Figure 6. Although most ATs performed evaluations on-site all of the time (72.0%; n = 2912), a much smaller percentage provided treatments (60.3%; n = 2439) or rehabilitation (39.0%; n = 1579) services all of the time. The majority of respondents (46.9%; n = 1896) worked under the direction of an orthopaedist, and 19.1% (n = 773) worked with a primary care or family medicine physician. Just under 8% (n = 318) indicated that they did not have a supervising or team physician. A description of the various models with which

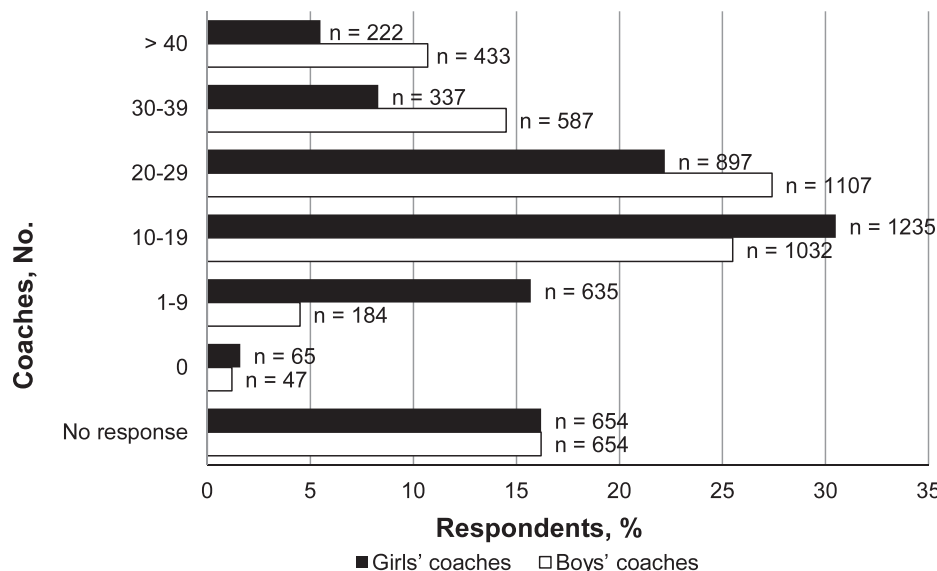


Figure 4. Number of coaches reported by respondents.

Table 2. Athletic Trainers' Athletic Training Budgets

| Athletic Training Budget | % (No.) |
|--------------------------|------------|
| <\$2000 | 23.2 (779) |
| \$2000–3999 | 27.4 (920) |
| \$4000–5999 | 14.4 (482) |
| \$6000–7999 | 6.4 (214) |
| >\$8000 | 11.2 (375) |
| No budget | 17.5 (586) |

medical services are provided by the supervising or team physician is shown in Table 4.

DISCUSSION

The purpose of our study was to provide a nationally representative profile of the practice characteristics of the SSAT, using data drawn from the N4SB study. To improve both the quality of athletic training care and support and current working conditions, our profession must examine how its members practice on a day-to-day basis. To date, little empirical evidence describes national trends in practice characteristics of ATs in any employment settings, including the secondary school setting, or of sports medicine coverage more generally. Evidence that does exist is limited to isolated state-based or city-based analyses of practice.^{10,11,13–29} We are the first to describe national practice trends in secondary school athletic training.

Moreover, the authors of most published studies regarding the secondary school athletic training setting have investigated only appropriate medical coverage, including access to an AT or other qualified health care provider. Those studies have not investigated the practice characteristics of the AT.^{10,11,13,20,27,28,30} However, other health care professions, including medicine, nursing, and physical therapy^{31–33} have performed practice analyses in different subsets to describe and improve patient care. For example, Resnik et al³¹ studied organizational and practice-related factors, including the use of physical therapy assistants with patients who have low back pain, that predicted performance in the treatment of low back pain syndromes in physical therapy clinics. Similarly, Freed et al^{32,33} surveyed pediatric and family nurse practitioners, respectively, to identify important provider, setting, and

patient characteristics. These types of analyses can expose practice deficiencies while revealing positive and productive aspects of current clinical practices at a national level.

Clinician and Setting Demographics

Our data reveal several interesting and previously unknown aspects of both SSAT provider and practice setting characteristics. To our knowledge, no previous authors have established age and experience levels for SSATs. The average age of the SSAT in our sample was 35.7 ± 9.9 years, which mirrors the national average for working certified NATA members (35.6 years; Russell Lowe, written communication, March 2012). Moreover, our sample suggests that most SSATs are in the early stages of their careers and still relatively new to the secondary school practice setting, with 62.3% ($n = 2522$) of respondents having 10 or fewer years of experience as an SSAT. Furthermore, the athletic director serves as the direct supervisor for the majority (approximately 65%) of SSATs.

Together, these data paint a picture of the SSAT as a relatively young, early-stage to midstage provider, working alone, and typically supervised by a non-health care provider, in a small to midsize school. And, although this is beyond the scope of the current study, it is likely that most schools with smaller enrollments are either rural or small-town schools or private urban schools, so several socioeconomic and geographic factors should be topics for future study. For example, many rural areas have been identified as medically underserved areas and pose particular challenges to isolated health care providers who work there, including challenges related to resources, partnerships, and service provision.³⁴ This is especially true of issues such as continuing education needs and competency maintenance,³⁵ as well as access to information technologies,³⁶ including wireless, high-speed Internet access. Future study is needed to elucidate the intersection of athletic training practice with these factors. Finally, although our data do not directly allow for this analysis, they do facilitate some comparison between AT and coach staffing levels. If validity is established in future research, such a ratio could be used to counter claims that secondary schools cannot afford to provide medical services for their student-athletes.

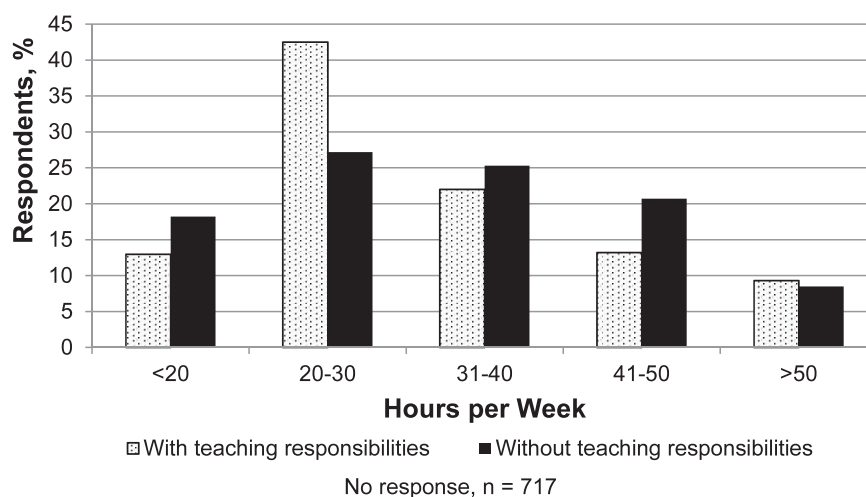


Figure 5. Hours worked per week providing athletic training services by respondents with or without teaching responsibilities.

Table 3. Distribution of Respondents' Game and Practice Coverage, % (No.)

| Coverage | Games | Practices |
|------------------|-------------|-------------|
| All of the time | 71.2 (2880) | 55.5 (2243) |
| Some of the time | 8.8 (357) | 16.5 (666) |
| Occasionally | 1.5 (61) | 3.7 (148) |
| Rarely | 0.5 (19) | 3.7 (148) |
| Never | 0.3 (11) | 3.0 (123) |
| No response | 17.7 (717) | 17.7 (717) |
| Total | 100 (4045) | 100 (4045) |

Athletic Training Practice Characteristics

Athletic training practice characteristics can be divided into 2 categories. The first category includes those structural aspects of the AT's employment position that may directly or indirectly influence practice. For example, 33.7% (n = 1365) of respondents had either no athletic training budget or a budget of less than \$2000. The obvious concern is whether budget amounts are appropriate to facilitate adequate patient care. Although our analysis does not allow the formal calculation of budget adequacy, a recent study⁵ has demonstrated that along with the presence of an AT, the most significant factor for providing effective medical care is a sufficient sports medicine budget. In fact, according to Wham et al,⁵ 40% of our respondents were at risk of providing a significantly lower quality of care when compared with those respondents who had larger budgets. Informal calculations using data from those respondents with established budgets suggest a range of expenditure levels, some as low as \$10 per athlete. It is difficult for us to imagine that funding at such levels is adequate to provide appropriate medical care to secondary school student-athletes, but this is an important question for future study.

Another structural factor is the employment configuration of the AT's position, including areas of responsibilities, work hours, and supervisory factors. No previous investigators have established the prevalence of employment models in the secondary school. The majority of our respondents were directly employed by their schools in full-time positions, and only 23% had teaching responsibilities in addition to their AT position. When ATs are employed on-site, the benefits to the larger secondary school community can be significant. Employing an AT can reduce annual costs to the school district and community by providing immediate care and treatment to injured athletes. In 1 high school, 2 ATs provided 13 766 treatments, which if delivered in an outpatient orthopaedic or sports medicine clinic, would be valued² at \$2 753 200. In the secondary school setting, these individual services are provided to student-athletes at no cost beyond the AT's salary. In this capacity, SSATs provide students, parents, and the community with regulated health care coverage, cost savings, and a more secure sport environment in which athletes can participate.⁴

One employment concern in the secondary school setting is the potential for long work hours, including evenings and weekends, and imbalanced and variable work schedules. It is interesting that SSATs without teaching responsibilities had a more even distribution of their work hours across the work-hour category options, at levels up to and including 50 hours of work per week (Figure 5). The data did not show a skewed profile of ATs without teaching responsi-

bilities working more than 40 hours per week. By comparison, those ATs with teaching responsibility were unevenly distributed at the lower end of the hours-per-week scale for providing athletic training services, with the majority (55%; n = 513) working 30 hours or less (compared with 45% of those without teaching responsibility). This might suggest an artificial work limit is imposed on the provision of AT services by those who also had teaching responsibilities, in response to what would otherwise be a significant weekly workload and a potential quality-of-life concern. Last, 70% (n = 1701) of respondents without teaching responsibilities indicated they worked 40 hours or less per week. The potential for work-life balance with the AT-only employment model may be greater than previously assumed.

Both employment and physician supervision were addressed by the current study. A total of 80% of respondents reported directly to an athletic director by virtue of their employment arrangement. Although this arrangement was expected and is commonplace in the traditional practice setting, recent trends in athletic training service administration in college and university settings suggest that having a direct employment supervisor who is independent from the athletic program and, preferably, has health care knowledge and training, may be valuable.^{37,38} Furthermore, an employment supervisor and a required medical director who have professional credentialing would greatly decrease the potential for conflict and confusion that exists for the typical SSAT. Perhaps the most concerning finding of our study was that almost 10% of our respondents did not have a supervising or team physician. Medical direction of athletic training practice is required by most state licensing laws and is a requirement of the Board of Certification "Standards of Professional Practice" for all AT credential holders.³⁹ Such a finding suggests a great need for education at both the state and national levels to ensure widespread compliance with regulatory requirements and practice standards.

The second category of practice characteristics includes specific actions and decisions made by the AT for the purpose of providing patient care. The 2 most obvious decisions are event-coverage decisions and the frequency and scope of AT services, including injury evaluation, treatment, and rehabilitation. Although medical coverage at athletic events has been studied frequently, all previous research* has been confined to the boundaries of an individual state or city, and most focused specifically on medical coverage of home football games.

The local nature of prior studies, as well as the age of many existing studies, complicates direct comparison with our findings. However, our results are similar to those found by Konin et al¹⁰ for AT coverage of home football games (79%) in Florida. Yet they differ greatly from the findings of Bell et al³⁰ for medical provider coverage (49%) of games in Illinois. Our data also provide unique insight into ATs' travel decisions, with 71% of respondents traveling to all or some away football games. That number drops to 15.6% for those who travel to regular season and playoff games in nonfootball sports. Such disparities in travel are typically justified with reference to the risks associated with football, but they also create opportunities

* References 10, 11, 13, 17, 19, 20, 22, 24, 26, 27, 29, 30, 40.

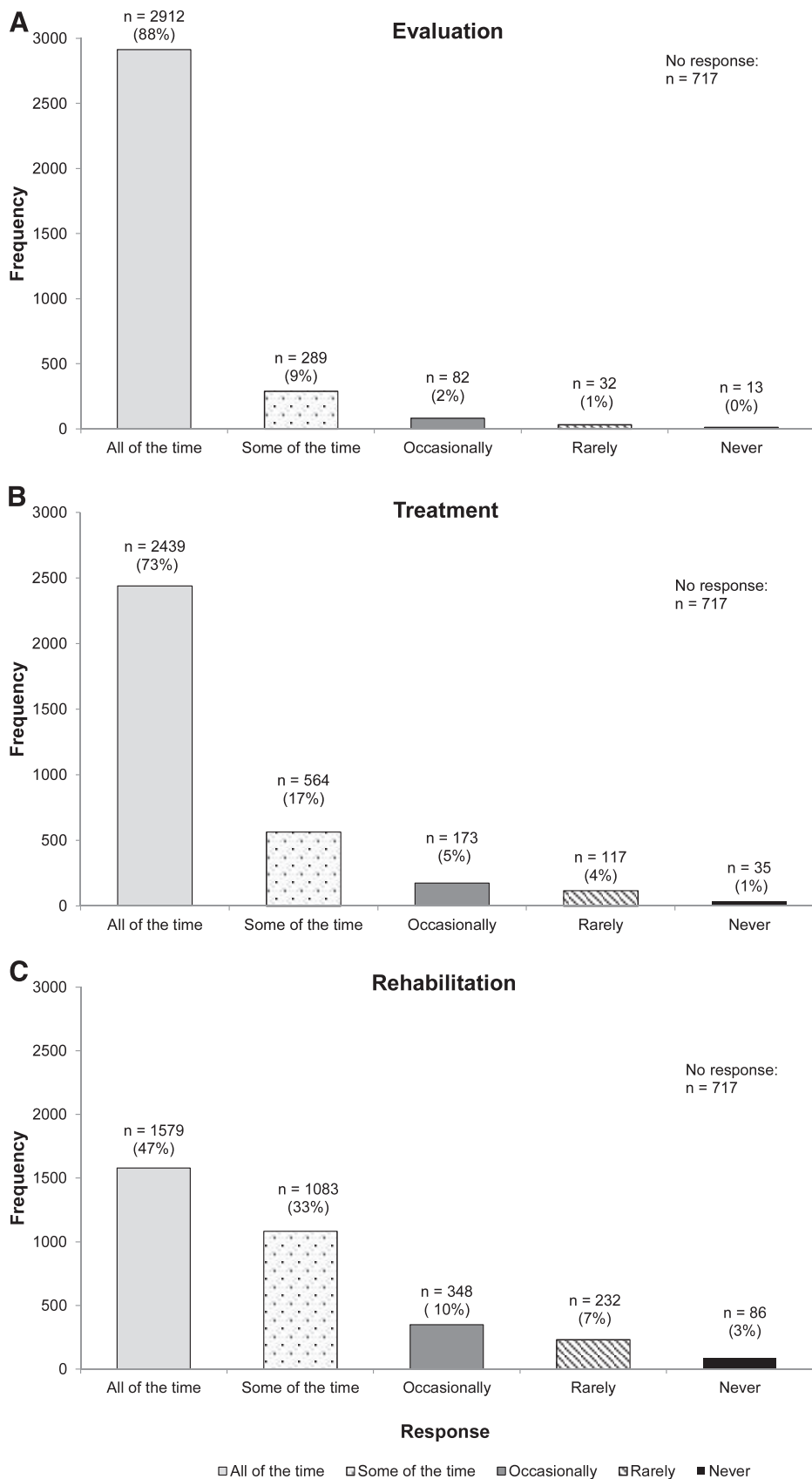


Figure 6. Distribution of respondents' on-site clinical practice tasks.

Table 4. Medical Services Provided by the Primary Supervising or Team Physician^a

| Medical Services | Responses, % (No.) |
|---|--------------------|
| Covers football games | 61.7 (2494) |
| By referral | 51.8 (2094) |
| Phone consultation | 48.0 (1943) |
| Provides preparticipation physical examinations | 25.5 (1032) |
| Emergency support | 24.3 (981) |
| Covers playoffs | 18.9 (763) |
| Weekend bump and bruise clinic | 15.1 (611) |
| No medical services provided | 7.9 (320) |
| Covers games for sports other than football | 0.4 (15) |
| Covers football practices | 0.7 (27) |
| Covers practices for sports other than football | 0.4 (15) |
| No response | 17.0 (689) |

^a Respondents were able to choose more than one response; therefore, percentages do not total 100.

for risk and liability exposure that should be carefully considered by the AT and athletic administration. Wrestling, girls' basketball, and girls' soccer follow football as the sports with the highest rates of severe injuries.² Higher rates of injury have also been noted in competitions compared with practices, especially in girls' and boys' soccer.¹²

For the first time, our study establishes the frequency with which ATs engage in on-site clinical practice tasks; specifically, we asked respondents how frequently they engage in evaluation, treatment, and rehabilitation. Most surprising was the relatively low rate with which our respondents engaged in rehabilitation tasks, as compared with the frequency of evaluation and treatment tasks. We hypothesize that this is primarily due to a combination of perceived time constraints, created by both the volume of patients encountered in the typical secondary school setting and the fact that rehabilitation may be perceived as a less critical or less urgent component of an AT's practice in that setting, at least when compared with the urgency of injury evaluation and treatment. Covering multiple simultaneous practices or events, along with the other standard aspects of athletic training patient care, requires the AT to prioritize where and how to spend time. This often leaves little time for tasks such as rehabilitation, which by comparison can be perceived as having lower priority, especially because priorities are often established by younger, less experienced ATs, working under the supervision of a non-health care provider.

We find these results about clinical practice tasks concerning for several reasons. First, they suggest that a large segment of the SSAT community is challenged to meet the standards established for appropriate medical care in that setting.⁶ Second, they undercut efforts for the profession to be seen by the general public as something more than just a coverage provider, which reduces the AT to a role similar to that played by an EMT or paramedic who covers a sporting event. To maximize the full scope of the AT's skills and to maximize the influence the AT has on the student-athlete, school, and local community, the profession must promote effective care in this setting. Future research efforts should focus on discovering strategies to assist SSATs to recapture time, perhaps through a reprioritization of roles and responsibilities, in conjunction with novel employment models that provide an

employment supervisor who is a health care professional, to ensure that rehabilitation services can be offered by a greater number of SSATs.

Limitations and Future Directions

This study is not without limitations. The survey was sent only to ATs who were listed in the NATA membership database. Therefore, non-NATA members were excluded from participating in the survey. Additionally, data from schools without ATs were not obtained, because our purpose was to evaluate SSAT practice characteristics. Our response rate of 28% was acceptable but may have not been nationally representative and did include nonresponses for many questions. Last, the survey did not ask about prevention activities, which is an important athletic training domain.

Future authors should begin to identify associations between certain clinician and school characteristics and practice patterns. For example, whether the time engaged in aspects of practice, such as evaluation and rehabilitation, differs by employment model, school size, and ATs' experience is of interest. Future investigators should also focus on the primary components of athletic training practice in secondary schools as identified in the "Appropriate Medical Care for Secondary School-Aged Athletes" consensus statement.⁶ Continuing to evaluate the practice characteristics of the ATs working in this important athletic training setting should be seen as a priority to improve the health care provided to student-athletes and the working environment of SSATs.

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REFERENCES

1. Howard B, Gillis J, National Federation of State High School Associations. High school sports participation tops 7.6 million, sets record. <http://www.nfhs.org/content.aspx?id=4208>. Accessed March 24, 2013.
2. Robinson B. Value of athletic trainers in the secondary school. *High School Today*. 2009;1:18–19.
3. Valovich McLeod TC, Bay RC, Parsons JT, Sauers EL, Snyder AR. Health-related quality of life is affected by recent injury in adolescent athletes. *J Athl Train*. 2009;44(6):603–610.
4. McGuine T. Sports injuries in high school athletes: a review of injury-risk and injury-prevention research. *Clin J Sport Med*. 2006;16(6):488–499.
5. Wham GS, Saunders R, Mensch J. Key factors for providing appropriate medical care in secondary school athletics: athletic training services and budget. *J Athl Train*. 2010;45(1):75–86.
6. Almquist J, Valovich McLeod TC, Cavanna A, et al. Summary statement: appropriate medical care for the secondary school-aged athlete. *J Athl Train*. 2008;43(4):416–427.
7. National Athletic Trainers' Association. Athletic training. 2009. <http://www.nata.org/athletic-training>. Accessed December 10, 2011.
8. American Medical Association. Report 5 of the council on scientific affairs (A-98): certified athletic trainers in secondary schools. www.ama-assn.org/resources/doc/csaph/csaa-98.pdf. Accessed April 5, 2013.

9. National Athletic Trainers' Association. Athletic trainers fill a necessary niche in secondary schools. <http://www.nata.org/NR031209>. Accessed April 8, 2009.
10. Konin JG, Morris BJ, Liller K, Carey A, Coris E, Pescasio M. Status of medical coverage for high school football games in Florida. *Athl Train Sports Health*. 2011;3(5):226–229.
11. Rutherford DS, Niedfeldt MW, Young CC. Medical coverage of high school football in Wisconsin in 1997. *Clin J Sport Med*. 1999;9(4):209–215.
12. Downar C, O'Neil EH, Hough HJ. *Profiling the Professions: A Model for Evaluating Emerging Health Professions*. San Francisco, CA: Center for Health Professions; 2001.
13. Aukerman DF, Aukerman MM, Browning D. Medical coverage of high school athletics in North Carolina. *South Med J*. 2006;99(2):132–136.
14. Brunet ME, Giardina D. Sports medicine in Louisiana: a survey of 242 high schools. *J La State Med Soc*. 1984;136(8):25–27.
15. Cartland JE Jr. Medical care of high school athletes in Connecticut. *Conn Med*. 1985;49(10):645–646.
16. Cross PS, Karges JR, Adamson AJ, Arnold MR, Meier CM, Hood JE. Assessing the need for knowledge on injury management among high school athletic coaches in South Dakota. *S D Med*. 2010;63(7):241–245.
17. Culpepper MI. The availability and delivery of health care to high school athletes in Alabama. *Phys Sportsmed*. 1986;14(1):130–137.
18. Culpepper MI, Niemann KM. Professional personnel in health care among secondary school athletics in Alabama. *South Med J*. 1987;80(3):336–338.
19. Lackland DT, Akers P, Hirata I Jr. High school football injuries in South Carolina: a computerized survey. *J S C Med Assoc*. 1982;78(2):75–78.
20. Lindaman LM. Athletic trainer availability in interscholastic athletics in Michigan. *J Athl Train*. 1992;27(1):9–10, 12, 14, 16.
21. Mathews E, Esterson P. Sports medicine in Northern Virginia high schools. *Athl Train J Natl Athl Train Assoc*. 1983;18(2):181–182.
22. McCarthy MR, Hiller WD, Yates-McCarthy JL. Sports medicine in Hawaii: care of the high school athlete in Oahu's public schools. *Hawaii Med J*. 1991;50(11):395–396.
23. Nass SJ. A survey of athletic medicine outreach programs in Wisconsin. *J Athl Train*. 1992;27(2):180–183.
24. Porter M, Noble H, Bachman D, Hoover R. Sportsmedicine care in Chicago-area high schools. *Phys Sportsmed*. 1980;8(2):95–99.
25. Potter BW. *A Historical Review of Secondary School Athletic Training Coverage in West Virginia* [master's thesis]. Huntington, WV: Marshall University; 2005.
26. Tonino PM, Bollier MJ. Medical supervision of high school football in Chicago. *Phys Sportsmed*. 2004;32(2):37–40.
27. Tucker JB, O'Bryan J, Brodowski B, Fromm B. Medical coverage of high school football in New York State. *Phys Sportsmed*. 1988;16(9):120–125, 127–128, 130.
28. Vangsness CT Jr, Hunt T, Uram M, Kerlan RK. Survey of health care coverage of high school football in southern California. *Am J Sports Med*. 1994;22(5):719–722.
29. Wrenn J, Ambrose D. An investigation of health care practices for high school athletes in Maryland. *Athl Train J Natl Athl Train Assoc*. 1980;15(2):85–92.
30. Bell K, Prendergast HM, Schlichting A, Mackey E, Mackey M. Preparedness among Illinois high school athletic departments: does size or location matter? *Internet J Health*. 2005;4(2). doi: 10.5580/28e.
31. Resnik L, Liu D, Mor V, Hart DL. Predictors of physical therapy clinic performance in the treatment of patients with low back pain syndromes. *Phys Ther*. 2008;88(9):989–1004.
32. Freed GL, Dunham KM, Lamarand KE, Loveland-Cherry C, Martyn KK; and American Board of Pediatrics Research Advisory Committee. Pediatric nurse practitioners: roles and scope of practice. *Pediatrics*. 2010;126(5):846–850.
33. Freed GL, Dunham KM, Loveland-Cherry C, Martyn KK; and American Board of Pediatrics Research Advisory Committee. Family nurse practitioners: roles and scope of practice in the care of pediatric patients. *Pediatrics*. 2010;126(5):861–864.
34. Beatty K, Harris JK, Barnes PA. The role of interorganizational partnerships in health services provision among rural, suburban, and urban local health departments. *J Rural Health*. 2010;26(3):248–258.
35. Doorenbos AZ, Kundu A, Eaton LH, et al. Enhancing access to cancer education for rural healthcare providers via telehealth. *J Cancer Educ*. 2011;26(4):682–686.
36. Deville L. Solving rural America's healthcare challenges. *Health Manag Technol*. 2011;32(12):12–13.
37. Laursen MR. A patient-centered model for delivery of athletic training services. *Athl Ther Today*. 2010;15(3):1–3.
38. Thompson C. Examining what ails athlete care. *NCAA Champion*. 2010;3(3):9.
39. Board of Certification. Standards of professional practice. Implemented January 2006. http://kinrec.illinoisstate.edu/downloads/StandardsofProfessionalPractice_000.pdf. Accessed March 24, 2013.
40. Cartland JE Jr. Medical care of high school athletes in Connecticut. *Conn Med*. 1985;49(10):645–646.

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