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# Adherence to Drug-Dispensation and Drug-Administration Laws and Guidelines in Collegiate Athletic Training Rooms: A 5-Year Review

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***Context:*** To both ensure athletes' safety and avoid legal penalties, athletic trainers' (ATs') handling of medications in the athletic training room should conform with federal and state statutes.

***Objective:*** To revisit drug dispensation and administration in collegiate athletic training rooms 5 years after the initial study.

***Design:*** Survey study.

***Setting:*** College and university athletic training rooms.

***Patients or Other Participants:*** All 4627 certified ATs employed in National Collegiate Athletic Association Divisions I, II, and III and National Association of Intercollegiate Athletics institutions, as listed by the National Athletic Trainers' Association, were surveyed.

***Data Collection and Analysis:*** The survey was created for the 2001 study based on federal laws. We used analyses of variance to study compliance by division (I, II, or III) and sex and by sex and employment status (head or assistant AT).

***Results:*** A total of 2330 ATs (N = 4627, 50%) provided 1535 usable responses. For comparison with the 2001 data, only head ATs' responses were included (n = 670). In general, drug distribution compliance scores among head ATs were low (mean = 6.37 ± 0.15, range = 0–25 points). The ATs were less compliant when handling over-the-counter (OTC) medications. Only 55.5% of ATs stored medications in a locked cabinet, compared with 67.1% in 2001. A large number of ATs administered OTC drugs in any amount necessary (n = 689, 44%), and 3.6% (n = 55) allowed athletes access without any consultation, compared with 53.8% and 4.9%, respectively, in 2001. However, prescription medication practices improved since the first study. Also, we noted a main effect of employment status ($F_{1,934} = 5.57$, $P < .05$): head ATs were less compliant than assistant ATs.

***Conclusions:*** Compared with 5 years ago, ATs appear to be more compliant with federal statutes regarding prescription drug regulation. A thorough understanding of appropriate OTC medication administration practices still appears to be lacking.

***Key Words:*** medications, treatments, record keeping

**Key Points**

- Athletic trainers' compliance with federal and state laws regarding the dispensation and handling of over-the-counter and prescription medications has improved since 2001.
- Overall, however, athletic trainers in most collegiate athletic training rooms complied poorly with federal laws regulating the administration of medications.
- Head athletic trainers were less compliant than assistant athletic trainers.

Administration and distribution of over-the-counter (OTC) and prescription medications require multifaceted approaches to encompass a myriad of record-keeping, storage, and administration practices. The athletic training room setting is a unique health care environment, yet it is subject to federal and state laws and regulations for drug dispensation and administration. The National Athletic Trainers' Association (NATA) recently approved a consensus statement for the handling of medications in the athletic training room to aid athletic trainers (ATs) in managing medications.[1] Past researchers[2,3] indicated that compliance with federal regulations and guidelines regarding the dispensation of OTC and prescription medications has been poor. Athletic trainers may have engaged in drug-distribution practices that violate federal and state statutes, such as dispensing of medications by unqualified personnel, inappropriate packaging, distributing poorly labeled or poorly sorted prescription and nonprescription medications to athletes, and a lack of security and control regarding drugs. Record-keeping procedures also failed to meet recognized standards.

The administration and distribution of medications in the athletic training room must adhere to federal and state statutes in order to avoid legal penalties and, more importantly, to maintain appropriate and safe medical agents for athletes.[4–10] Several texts, articles, and presentations[7–11] have been prepared subsequent to the publication of our study of compliance with drug dispensation and administration in 2003.[3] These efforts have added to the knowledge and understanding of appropriate practices in athletic training settings.[7–11]

Since 2001, federal laws ensuring patient safety in the athletic training room have not changed. They include the Federal Food, Drug, and Cosmetic Act,[2] with subsequent laws to ensure safe drug quality, purity strength, labeling,

**Table 1. Federal Regulations Governing Pharmaceutical Care[a]**

| Regulation | Purpose |
|---|---|
| Federal Food, Drug, and Cosmetic Act (FDCA) of 1938[b] | Regulates the quantity, strength, bioequivalence, and labeling of prescription and nonprescription drugs |
| Durham-Humphrey Amendment of 1951[c] | Separates prescription from nonprescription drugs |
| Federal Anti-Tampering Act of 1983[25] | Created 7-point label requirements and tamper-resistant packaging on all nonprescription medications |
| Omnibus Reconciliation Act of 1990 (OBRA)[d] | Mandates drug review, patient medication records, and verbal patient education as part of dispensing of prescription medications |

[a] Reprinted with permission from Kahanov et al.[3]
[b] 21 USC §201 (1938).
[c] 21 USC §331 (1951).
[d] Pub L No. 101-508, 5 USC §13214 (1990).

and packaging (Table 1).[1–7] In addition, federal regulations specify proper storage conditions, labeling, and record-keeping standards. Such regulations are specifically designed to ensure that medication is potent, that patients (eg, athletes) know what the medication is, that patients know the prescribed use, and that patients are appropriately monitored.[1–7]

Safety risks and failure to adhere to federal and state statutes were found in samples of ATs surveyed in 1993[2] and 2001.[3] Our purpose was to revisit drug dispensation in collegiate athletic training rooms 5 years after the initial drug-dispensation and drug-administration data were collected in 2001,[3] to assess the extent of ATs' compliance with federal laws and regulations, and to describe current practices regarding the dispensation of medications in an athletic training setting.

## METHODS

Using SurveyMonkey (Menlo Park, CA), we e-mailed a 65-item survey assessing athletic training room drug distribution to 4627 ATs in National Collegiate Athletic Association (NCAA) Divisions I, II, and III and National Association of Intercollegiate Athletics (NAIA) institutions who were members of the NATA in 2001. The San Jose State University Human Subjects Institutional Review Board approved the study. A cover e-mail message was included describing the importance of participation in the study, with a link to the online survey. Confidentiality issues were also discussed on the introductory screen. Surveyed ATs received e-mail reminder prompts 1 week after the survey was initially e-mailed.

### Survey Instrument

For use in the 2001 study,[3] a survey was created based on principles set forth by federal laws (Table 1) and by published guidelines for ATs[1–8,10–24] regarding the administration and dispensation of prescription and OTC medications and record keeping. The survey assessed 9 demographic items, including age, sex, employment setting, employment position, number of years as an AT, number of years in current position, athletic division, additional certifications, and institutional relationship to medical entity.

Nine drug-management categories assessed the 7-point label, OTC administration, OTC record keeping, OTC storage, OTC access, prescription medication storage, prescription medication access, and medication handling by ATs and athletic training students. These categories were measured across 56 items. The 56 drug-management items required a *yes* or *no* response specifically related to drug-dispensation and drug-administration laws and regulations, as well as published guidelines for ATs.[1–8,10–24]

We developed a compliance measure using 25 of the drug-management items. Specifically, compliance was measured based upon how OTC medications were stored, dispensed, and recorded (ie, *in a locked cabinet*, *administered without consult*, *in 1-dose packets*, *in the amount necessary*, *recorded on an individual chart*, *administered in open cups/vials according to appropriate dosage*, *administered in packets pre-prepared in the athletic training room*, *administered from large-quantity bottles*, or *administered in individual packets*). Compliance also specifically measured how prescriptions were accessed (ie, *stored in a locked cabinet*, *accessed by students*, *accessed by physicians*, *accessed by others [nurses]*, or *accessed by the ATs*. Compliance included ATs' handing of prescription medications to an athlete without a physician present, based on a physician's phone request, and based on physicians' standing orders. Finally, compliance measured athletic training students' handing of prescription medications to an athlete while a physician was not present, to athletes on road trips, to athletes based on a physician's phone request, or to athletes based on a physician's standing orders, or never handing a prescription medication to an athlete.

Participants received 1 point for each correct answer, for a total possible compliance score of 25 points. Compliance was categorized using the following categories: 22 to 25 points was deemed *compliant*, 19 to 21 points was *moderately compliant*, 13 to 18 points was *marginally compliant*, and less than 13 points was *poorly compliant*. The remaining 31 questions addressed athletic training room practices that were not mandated under federal guidelines and, therefore, were not calculated as part of the compliance score. These items provided perspectives on current drug-management practices. Respondents completed the survey by clicking on the appropriate boxes provided.

### Data Collection and Analysis

Data were collected to assess drug-dispensation practices in collegiate athletic training rooms. We used SPSS (version 14.0; SPSS Inc, Chicago, IL) to calculate

**Table 2. Respondent Demographic Information: 2006 Data Collection (Mean ± SD)**

| Characteristic | All Respondents (N = 2333) | Collegiate Setting (n = 1535 ) | Head Athletic Trainer, Collegiate Setting (n = 670) | Assistant Athletic Trainer, Collegiate Setting (n = 272) |
|---|---|---|---|---|
| Age, y | 36.62 ± 9.69 | 36.54 ± 9.67 | 37.39 ± 9.40 | 31.83 ± 8.47 |
| Years in current position | 4.60 ± 12.16 | 7.50 ± 7.09 | 8.61 ± 7.94 | 5.34 ± 5.75 |
| Years as an athletic trainer | 12.40 ± 8.90 | 12.36 ± 8.58 | 14.79 ± 8.71 | 8.65 ± 7.17 |

descriptive statistics and two 2-way analyses of variance (ANOVAs). The ANOVAs were computed to study compliance using (1) collegiate division (I, II, or III) and sex and (2) sex and employment status (head AT or assistant AT).

## RESULTS

Responses were returned by 2333 of the certified ATs solicited, representing approximately 50% of the individuals surveyed. An additional 453 surveys were returned because of insufficient e-mail addresses (9.8% of NATA members). Also, 345 surveys (7.4% of NATA members) were unusable because of survey distribution malfunctions. Overall, the useable surveys from collegiate ATs constituted 1535 (66%) of the respondent pool.

On average, respondents had 12.30 ± 7.90 years as ATs, had been employed in their current positions for 4.60 ± 12.16 years, and had been certified for 12.40 ± 8.90 years (Table 2). The sample included more men (n = 1375, 59%) than women (n = 955, 41%). Most respondents were head ATs (n = 952, 62%); the remainder included assistant ATs (n = 368, 24%) and 215 respondents (14%) who either did not specify a position or a title or cited an alternative title. Nearly all respondents indicated that they were ATs (n = 1527, 99.5%), whereas 8 (0.5%) respondents did not specify certifications. In addition to certification in athletic training, respondents held certifications as physical therapists (n = 34, 2.2%); certified strength and conditioning specialists (n = 173, 11.3%); and emergency medical technicians, basic (n = 92, 6%); unidentified certifications totaled 261 (17%). Respondents' certifications in this sample were closely aligned with the certifications of respondents in the 2001 sample.[3]

To enable comparisons with the 2001 data, overall collegiate data are provided. In addition, the data are aggregated by head ATs and assistant ATs to reduce redundancy of data from the same collegiate athletic training rooms. To assess athletic training room compliance with federal drug laws, only collegiate head ATs' data were used for ANOVA calculations. Of the 1535 respondents who submitted usable surveys, 670 head ATs had their surveys extracted for further analysis.

In this pool of head ATs, the mean age was 37.39 ± 9.40 years. They had served 8.47 ± 7.47 years as head ATs and had been employed 13.39 ± 9.08 years in their current positions. Men composed 62% of the head ATs (n = 415); 38% (n = 583) were women. The total sample included 272 assistant AT respondents from the collegiate setting. Of the assistant ATs, 131 were men (48.2%) and 141 (51.8%) were women. Their age was 31.8 ± 8.47 years, and their number of years as an AT was 8.65 ± 7.17 years. They were employed in their current positions for 5.34 ± 5.75 years.

Respondents identified their institution's athletic division as NCAA Division I (n = 587, 25.2%), Division II (n = 377, 16.2%), or Division III/NAIA (n = 620, 26.6%). These last 2 categories of institutions were collapsed for 2 reasons: because a large number of respondents checked both the Division III and NAIA boxes on the survey and because we wanted to be able to compare data from 2001 and 2006. An unexpected outcome of the online survey was the return from individuals reporting that they had moved to other employment settings; therefore, the professional, high school, and clinic/high school settings were inadvertently surveyed. The professional setting represented 12.0% of the respondents (n = 280); the high school setting, 14.6% (n = 340); and the clinic/high school setting, 5.4% (n = 126). Head ATs in the collegiate setting reported their institutional affiliation as NCAA Division I (n = 161, 24.0%), Division II (n = 114, 17.0%), or Division III/NAIA (n = 395, 58.8%). Assistant ATs reported their division as NCAA Division I (n = 122, 44.9%), Division II (n = 44, 16.2%), or Division III/NAIA (n = 105, 38.6%).

When compared with compliance scores from the 2001 data (12.34 ± 7.90), the 2006 data (6.37 ± 3.90) indicate that compliance dropped over time, which may be more related to the administration of OTC medications than to the administration of prescription medications (Tables 3 and 4). With regard to OTC storage issues, more than half of head ATs (n = 368, 55.5%) indicated that medications were stored in a locked cabinet, as compared with 67.1% (n = 96) of 2001 respondents. Less than half of ATs (n = 295, 43.6%) administered OTC drugs in any amount necessary (eg, weekly or weekend doses), and 24 respondents (3.6%) reported allowing athletes access to OTC medications without any consultation (ie, ''on the counter''), compared with 53.8% (n = 77) and 4.9% (n = 7), respectively, in 2001. The number of ATs providing OTC drugs in single-dose packets improved slightly from 2001, from 41.2% (n = 59) to 47.9% (n = 321) in 2006. In 2001, most

**Table 3. Compliance Scores: 2001 and 2006 Samples (Mean ± SD)**

| Category | 2001[a] | 2006 |
|---|---|---|
| Position | | |
| Head athletic trainer | NA | 6.37 ± 0.15 |
| Assistant athletic trainer | NA | 7.17 ± 0.28 |
| Institution | | |
| National Collegiate Athletic Association Division I | 14.38 | 5.29 ± 0.50 |
| National Collegiate Athletic Association Division II | 13.65 | 7.08 ± 0.69 |
| National Association of Intercollegiate Athletics/National Collegiate Athletic Association Division III | 10.17 | 7.77 ± 0.62 |
| Total sample | 12.34 ± 7.90 | 6.37 ± 3.90 |

Abbreviation: NA, not available.

[a] Data from the 2001 study were corrupted and therefore not available for calculation of SD except for the total sample.

**Table 4. Compliance With Federal OTC Medication Laws: 2001 and 2006 Samples**

| Survey Item | Responses, n (%) | | | |
|---|---|---|---|---|
| | 2001 | 2006 | | |
| | Total Sample (n = 143) | Total Sample (n = 1535) | Head Athletic Trainers (n = 670) | Assistant Athletic Trainers (n = 272) |
| OTC medication storage | | | | |
| In a nonlockable cabinet | 41 (27.9) | 451 (29.4) | 170 (25.4) | 97 (35.9) |
| In a locked cabinet[a,b] | 96 (67.1) | 866 (56.4) | 368 (55.5) | 155 (57.0) |
| Head or assistant athletic trainer's office[a] | 27 (18.8) | 263 (17.1) | 167 (24.9) | 42 (15.5) |
| Main patient treatment area[a] | 27 (31.4) | 299 (19.5) | 81 (12.1) | 38 (14.1) |
| Physician's office[a] | 20 (13.9) | 267 (17.4) | 120 (17.9) | 56 (20.4) |
| OTC medications are administered | | | | |
| Without consult (ie, on the counter)[a,b] | 7 (4.9) | 55 (3.6) | 24 (3.6) | 10 (3.7) |
| In any amount necessary through athletic trainer[a,b] | 77 (53.8) | 689 (44.9) | 292 (43.6) | 134 (49.1) |
| In 1-dose packets only[a,b] | 59 (41.2) | 705 (45.9) | 321 (47.9) | 116 (42.7) |
| OTC medications are recorded | | | | |
| In an athlete's individual chart[a,b] | 20 (13.9) | 129 (8.4) | 53 (7.9) | 26 (9.6) |
| On a record sheet[a] | 71 (49.7) | 788 (51.3) | 332 (49.6) | 142 (52.3) |
| Not recorded[a,b] | 66 (46.1) | 504 (32.8) | 215 (32.0) | 87 (32.1) |
| OTC medications are administered | | | | |
| Open cups/vials according to appropriate dosage[a,b] | 11 (7.7) | 325 (21.2) | 88 (13.2) | 69 (25.5) |
| In packets preprepared in the athletic training room from large-quantity bottles (bulk)[a,b] | 20 (13.9) | 388 (25.3) | 99 (14.9) | 53 (19.5) |
| Large-quantity bottles with verbal instructions[a] | 52 (36.3) | 261 (17.0) | 194 (28.9) | 46 (17.0) |
| Individual single-dose packets prepared by manufacturer[a,b] | 109 (76.2) | 1274 (83.0) | 570 (85.1) | 219 (80.5) |

Abbreviation: OTC, over the counter.

[a] Percentages may equal more than 100% because multiple responses were allowed.

[b] Survey item was used in the calculation of compliance scores; not all such items are represented in the Table.

respondents recorded OTC medication dispensation on a log sheet (n = 71, 49.7%), similar to 2006 data (n = 332, 49.6%). Record keeping decreased slightly with regard to OTC administration on individual charts, from 13.9% of respondents (n = 20) in 2001 to 7.9% (n = 53) in 2006. A decrease in record keeping, including overall dispensation, remaining medications available, and ordering, was identified in 2006 (32.0%, n = 215), compared with 46.1% (n = 66) in 2001 (Table 4).

As described by head ATs, OTC administration was similar from 2001 to 2006, with a slight decrease in compliance; however, compliance with federal law regarding prescription medication handling in the athletic training room increased slightly from 2001 to 2006 (Table 5). A large number of respondents stored prescription medications in a locked cabinet in 2001 (n = 65, 38.6%), whereas in 2006, 49.6% (n = 332) of respondents reported that they did not have prescription medications in the athletic training room (Table 5). Athletic training personnel had more access to prescription medications in the 2006 sample (83.9%, n = 562) than in the 2001 sample (34.3%, n = 49). More physicians had access to prescription medications in the athletic training setting in 2001 (50.3%, n = 84) than in 2006 (31.8%, n = 213). Athletic training students' handling of prescription medications differed from 2001 to 2006. In most athletic training rooms in 2006, students were prohibited from dispensing prescription medications to athletes (97.4%, n = 650), which is a substantial change in compliance since 2001, when it was only 40.5% of the sample (n = 58; Table 5). About one-fifth of the ATs reported that they ordered prescription medications (n = 134) in 2006, compared with 27.3% (n = 46) in 2001. Physicians were responsible for medication ordering most often in athletic training rooms in 2006 (n = 319, 47.6%) as opposed to 4.8% (n = 8) in 2001 (Table 6). In both the 2001 and 2006 athletic training rooms, more than 40% of the ATs surveyed checked for outdated or deteriorated medications annually. An increase in biannual inventory investigation occurred in 2006 (44.7%, n = 300) as compared with 2001 (27.9%, n = 47).

### Compliance Score Comparisons

The 2-way ANOVA examining collegiate division (I, II, or III) and sex failed to reveal any main effects or interaction. The 2-way ANOVA examining sex and employment status (head AT or assistant AT) revealed a main effect of employment status ($F_{1,934} = 5.57$, $P < .05$). On average, head ATs were poorly compliant (compliance = 6.37 ± 0.15). They scored lower ($P < .05$) than the poor-scoring assistant ATs (compliance = 7.17 ± 0.28).

## DISCUSSION

To better understand compliance with federal and state laws regarding drug administration of collegiate ATs, we followed up on a 2001 study.[3] Some problem areas persist, including the use of unqualified personnel to dispense medications, inappropriate packaging and labeling of medications being dispensed, and a general lack of appropriate record keeping. Several refereed publications and texts have been published that include information for the administration and dispensation of OTC and prescription medications in the athletic training room.[7–11] Further, the NATA has recently published a consensus statement

**Table 5. Compliance With Federal Prescription Medication Laws: 2001 and 2006**

| Survey Item | Responses, n (%) | | | |
|---|---|---|---|---|
| | 2001 | 2006 | | |
| | Total Sample (n = 143) | Total Sample (n = 1535) | Head Athletic Trainers (n = 670) | Assistant Athletic Trainers (n = 272) |
| Prescription medication storage | | | | |
| In a nonlockable cabinet | 7 (4.8) | 37 (2.4) | 15 (2.3) | 10 (3.5) |
| In a locked cabinet[a] | 65 (38.6) | 742 (48.3) | 263 (39.3) | 152 (56.0) |
| No prescription medications in athletic training room | 54 (37.7) | 576 (37.5) | 332 (49.7) | 71 (26.2) |
| Individuals with access to prescription medication | | | | |
| All athletic trainers | 49 (34.3) | 576 (37.5) | 562 (83.9) | 141 (51.8) |
| Head athletic trainer only | 31 (21.7) | 216 (14.1) | 85 (12.7) | 33 (12.2) |
| Athletic training students[a,b] | 72 (50.0) | 25 (1.6) | 60 (0.09) | 6 (2.2) |
| Physician[a,b] | 72 (50.0) | 84 (50.3) | 213 (31.8) | 159 (58.3) |
| Other (physical therapist, nurse, etc)[a,b] | 100 (70.0) | 91 (5.9) | 19 (2.8) | 92 (33.7) |
| Athletic trainers handle prescription medication in the following situations | | | | |
| Hand to athlete while the physician is present | 74 (51.7) | 393 (25.6) | 143 (21.4) | 68 (25.1) |
| Hand to athlete while the physician is not present[a,b] | 44 (30.7) | 177 (11.5) | 52 (7.7) | 39 (14.3) |
| Hand to athlete on road trips[b] | 32 (22.3) | 34 (2.2) | 11 (1.7) | 6 (2.2) |
| Hand to athlete based on physician's phone request[a,b] | 55 (38.4) | 270 (17.6) | 29 (4.3) | 61 (22.4) |
| Hand to athlete based on a physician standing order[a,b] | 9 (6.9) | 66 (4.3) | 97 (14.5) | 8 (3.1) |
| Never[b] | 41 (28.6) | 597 (38.9) | 338 (50.4) | 89 (32.7) |
| Athletic training students handle prescription medication in the following situations | | | | |
| Hand to athlete while the physician is present[b] | 11 (7.7) | 43 (2.8) | 60 (0.9) | 9 (3.2) |
| Hand to athlete while the physician is not present[a,b] | 2 (1.3) | 17 (1.1) | 60 (0.9) | 4 (1.4) |
| Hand to athlete on road trips[a,b] | 1 (0.7) | 9 (0.6) | 0 (0.0) | 4 (1.4) |
| Hand to athlete based on physician's phone request[b] | 6 (4.1) | 20 (1.3) | 6 (0.9) | 4 (1.4) |
| Hand to athlete based on a physician standing order[a,b] | 0 (0.0) | 3 (0.2) | 0 (0.0) | 1 (0.5) |
| Never[a,b] | 58 (40.5) | 1442 (94.0) | 650 (97.4) | 251 (92.3) |

[a] Survey item was used in the calculation of compliance scores; not all such items are represented in the Table.
[b] Percentages may equal more than 100% because multiple responses were allowed.

with recommendations for professional practice.[1] Compliance of ATs with federal and state laws regarding the dispensation and handling of OTC and prescription medications has improved over time; however, some areas of drug administration and knowledge of institution recognition as a pharmacy or formulary demonstrate declines in compliance since 5 years earlier.

The overall mean compliance scores suggest that ATs in the majority of collegiate athletic training rooms comply poorly with federal drug laws and regulations regarding administration. Average compliance scores in 2006 were lower than in 2001. In 2001, drug-dispensation and drug-administration compliance scores ranged from 5 to 20 (20%–80% compliance) of a possible 25 points, whereas the range of scores in 2006 decreased to 0 to 16 (0%–64%). The possibility exists that, given the large number of individuals surveyed, the 2006 data better represent the state of athletic training room policies with regard to these issues. Analysis by athletic division revealed a moderate effect on compliance. Although compliance was generally low, close inspection of the item responses contributing to the measure revealed that the overall low scores reflected less compliance with OTC regulations. The lower compliance scores indicate that ATs in collegiate athletic training rooms were either in poor compliance or breaking federal law, compromising both the welfare of student-athletes and their personal and professional ethics.

In 2006, regardless of athletic division or sex, compliance with federal guidelines was poor. Therefore, staff size and budget differences in Division I and Division III/NAIA institutions may not affect compliance. In general, compliance scores were lower in 2006 than in 2001. Perhaps this 2006 sample is more representative than the 2001 sample. For comparison with the 2001 study[3] and Laster-Bradley's[2] 1993 study, we assessed adherence to specific federal regulations and additionally published guidelines for ATs.[1–8,10–24] The data from the current study indicate that ATs' compliance with federal statutes regarding the handling of prescription medications has improved in that most athletic training rooms did not stock prescription medications. Athletic training rooms that did stock prescription medication were also more liberal with access to medications provided. Compliance has improved such that approximately 50% of ATs no longer dispensed prescription medications, compared with 29% in 2001. Although compliance with appropriate prescription drug-handling practices has improved, approximately 50% of the respondents still did not comply with federal drug laws. Athletic trainers continued to provide athletes with prescription medications based on a physician's request when present, on the phone, or on road trips (Table 5). In 50% of the settings, ATs reported that they did not handle prescription medications, which is appropriate when frequent physician interaction is available.

**Table 6. Drug-Management Demographics: 2001 and 2006 Samples**

| Survey Item | Responses, n (%) | | | |
|---|---|---|---|---|
| | 2001 | 2006 | | |
| | Total Sample (n = 143) | Total Sample (n = 1535) | Head Athletic Trainers (n = 670) | Assistant Athletic Trainers (n = 272) |
| Medication is checked for removal of outdated or deteriorated items | | | | |
| Biannually | 47 (27.9) | 686 (44.7) | 300 (44.7) | 118 (43.5) |
| Annually | 75 (44.8) | 639 (41.6) | 277 (41.3) | 122 (44.9) |
| The athletic training room or associated medical entity is (a) | | | | |
| Formulary | 44 (25.9) | 182 (11.8) | 70 (10.5) | 37 (13.5) |
| Pharmacy | 33 (19.6) | 137 (8.9) | 40 (5.9) | 24 (8.8) |
| Don't know | 26 (15.4) | 1136 (74.0) | 518 (77.3) | 205 (75.3) |
| No response | 39 (65.0) | 81 (5.3) | 43 (6.4) | 6 (2.3) |
| Individual responsible for managing the ordering and stocking of prescription medication | | | | |
| Athletic trainer | 46 (27.3) | 436 (28.4) | 134 (20.0) | 92 (33.8) |
| Physician[a] | 8 (4.8) | 745 (48.5) | 319 (47.6) | 141 (51.9) |
| Pharmacist[a] | 8 (4.9) | 54 (3.5) | 24 (3.6) | 9 (3.2) |
| Other (physical therapist, nurse, etc) | 19 (11.2) | 258 (16.8) | 194 (28.9) | 30 (11.1) |

[a] Percentages may equal more than 100% because multiple responses were allowed.

Administration and dispensation of drugs represent 2 separate functions controlled by federal and state laws. Administration includes, for example, providing an athlete with a single dose of OTC-strength ibuprofen. However, providing an overnight supply of OTC nonsteroidal anti-inflammatory drugs to an athlete is considered dispensation according to federal regulations. The *dispensation* of medication is federally defined as providing both prescription and OTC medication to a person beyond a single dose.[12,13,15,16,20,21,23] It is illegal for ATs to dispense medication; according to federal law, only pharmacists and physicians can dispense medication unless otherwise designated by each individual state.[12,13,15,16,20,21,23] Under no circumstances can a physician instruct an AT to dispense medication, although some states allow nurse practitioners and physician assistants to dispense medication.[3,11,13–15,18,20,21] Distribution of multiple OTC single-dose packets to an athlete is considered dispensation, which only physicians and pharmacists can provide according to federal regulations. The applications for ATs may not be well understood. Despite federal regulations for drug dispensation and administration, ATs and athletic training students continue to handle OTC medications in multiple-dose packages. Fewer than half of ATs reported administering OTC medications in single-dose packets. Only 3.6% of ATs allowed athletes free access to OTC medications (Table 4).

With specific guidelines available in the literature,[1–8,10–17,19–24] the small number of ATs in athletic training rooms who adhere to them is disturbing. Approximately 32.8% of ATs in collegiate athletic training rooms in 2006 failed to record the administration of OTC medication to an athlete, similar to the 2001 finding[3] (Table 4). The continued and pervasive lack of record keeping is not only an unsafe practice in the event of student-athlete illness or a medication recall, but it indicates a blatant disregard for established laws and guidelines.[4–8,10–17,19–24] In addition, approximately one-quarter of ATs in collegiate athletic training rooms neglected appropriate storage guidelines and failed to store OTC medications in a locked cabinet. Drug safety and accounting are imperative for appropriate administration and monitoring of medications. Failure to comply with these guidelines breaches clinical practice and appropriate medical care.

Recommendations based upon the 2001 study[3] were that collegiate athletic training room polices needed to be amended and that the sports medicine team should adhere to these policies, regardless of any inconvenience. Consistently in both the 2001 and 2006 data, a large number of ATs (36.0% and 31.0%, respectively) purchased OTC medications in bulk, which is understandably more economical; however, these ATs did not adhere to federal regulations for labeling when medications were placed in packets for consumption and administration. The federal Anti-Tampering Act of 1983[25] requires a 7-point label on all OTC medication (Table 7). In most athletic training rooms, ATs purchased single-dose packets, which adhere to federal label regulations and are both easy to administer and increasingly economical (Table 4).

In the athletic training room, ATs have improved their monitoring and disposing of outdated and deteriorated medications. However, the difference between a formulary and a pharmacy still eludes the majority of ATs and is important to identifying the types of medications available as well as assessing and making recommendations relevant to banned drugs (Table 6). As indicated earlier, an unexpected finding of this large electronic survey was the return of surveys from ATs who had changed employment settings. The data indicate that ATs in junior and community college athletic training rooms were the most compliant in their drug administration and dispensation. Interestingly, clinic/high school and high school athletic training rooms were the least compliant on average (overall scores of 5.3 and 4.4, respectively). Because the survey was not specifically directed at the clinic/high school and high

**Table 7. Federal Tampering Act Labeling Requirements 7-Point Label[a,13,20]**

| The label of a nonprescription drug is required to contain the following information: |
|---|
| 1. The name of the product |
| 2. The name and address of the manufacturer, packer, or distributor |
| 3. The net contents of the package |
| 4. The established name of all active ingredients and the quantity of certain other ingredients, whether active or not |
| 5. The name of any habit-forming drug contained in the preparation |
| 6. Cautions and warnings needed to protect the consumer |
| 7. Adequate directions for safe and effective use |

[a] Reprinted with permission from Kahanov et al.[3]

school environments, questions were not tailored for those settings and, therefore, additional analysis was not conducted. However, the high school environment should be studied regarding drug administration and dispensation to enable us to better understand current practices and ultimately provide optimal health care to minors participating in interscholastic athletics.

Overall, compliance with drug-administration and drug-distribution regulations was lower in 2006 than in 2001. This may be accounted for primarily by inappropriate OTC drug management. The possibility exists that neither the team physicians nor the ATs have time to provide all the services required to comply with state and federal drug regulations and, thus, they may make accommodations to provide service, albeit unlawful. Hence, the athletic health care team may need to be expanded to provide safe, effective, and legal drug therapy for athletes.[4–8,10–17,19–24]

## CONCLUSIONS

With respect to prescription medications, ATs appear to have progressed regarding compliance with federal statutes on drug regulation from previous data collected 5 years previously. Yet ATs' current understanding of OTC medication administration still appears to be less than desirable. We suggest that ATs in collegiate athletic training rooms review federal and state laws and regulations, seek out exemplary athletic training room drug policies, and revise institutional drug policies and procedures to comply with federal and state laws[1–6] as well as published guidelines for ATs.[10–17,19–24] Factors that contribute to noncompliance were not specifically identified in the current study but should be examined by future researchers to understand the difficulties ATs face with respect to OTC and prescription drugs in the athletic training room and ways to facilitate compliance. Lastly, further investigation into drug management in the high school and clinic/high school setting is warranted based on the unintended data obtained. Ultimately, athletic health care professionals must adhere to federal and state regulations to provide the best health care to student-athletes in a legal and safe manner.

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