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Staffing, Financial, and Administrative Oversight Models and Rates of Injury in Collegiate Athletes

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Context: Structural features of health care environments are associated with patient health outcomes, but these relationships are not well understood in sports medicine.

Objective: To evaluate the association between athlete injury outcomes and structural measures of health care at universities: (1) clinicians per athlete, (2) financial model of the sports medicine department, and (3) administrative reporting structure of the sports medicine department.

Design: Descriptive epidemiology study.

Setting: Collegiate sports medicine programs.

Patients or Other Participants: Colleges that contribute data to the National Collegiate Athletic Association (NCAA) Injury Surveillance Program.

Main Outcome Measure(s): We combined injury data from the NCAA Injury Surveillance Program, sports medicine staffing data from NCAA Research, athletic department characteristics from the United States Department of Education, and financial and administrative oversight model data from a previous survey. Rates of injury, reinjury, concussion, and time loss (days) in NCAA athletes.

Results: Compared with schools that had an average number of clinicians per athlete, schools 1 standard deviation above average had a 9.5% lower injury incidence (103.6 versus 93.7 per 10000 athlete-exposures [AEs]; incidence rate ratio [IRR] = 0.905, $P < .001$), 2.7% lower incidence of reinjury (10.6 versus 10.3 per 10000 AEs; IRR = 0.973, $P = .004$), and 6.7% lower incidence of concussion (6.1 versus 5.7 per 10000 AEs; IRR = 0.933, $P < .001$). Compared with the average, schools that had 1 standard deviation more clinicians per athlete had 16% greater injury time loss (5.0 days versus 4.2 days; IRR = 1.16, $P < .001$). At schools with sports medicine departments financed by or reporting to the athletics department (or both), athletes had higher injury incidences (31% and 9%, respectively).

Conclusions: The financial and reporting structures of collegiate sports medicine departments as well as the number of clinicians per athlete were associated with injury risk. Increasing the number of sports medicine clinicians on staff and structuring sports medicine departments such that they are financed by and report to a medical institution may reduce athlete injury incidence.

Key Words: medical model, medical autonomy, health policy, medical coverage, risk management

Key Points

- Structural features of the collegiate sports medicine environment, including the relative number of health care providers and the administrative and financial oversight models of the sports medicine department, are associated with athlete health outcomes.
- At schools where athletes had greater access to athletic health care providers, as measured by the ratio of clinicians per athlete, they had lower incidences of injury, reinjury, and concussion.
- At schools where the sports medicine team was financed by or reported to the athletics department, athletes had a higher incidence of injury.

Injury surveillance is an important element of research aimed at understanding and improving athlete health outcomes. With nearly half a million US athletes participating in organized sports at the collegiate level each year,[1] the collegiate sports setting provides a unique opportunity to study factors that influence athlete injury. An important source of data on collegiate sports injury in the United States is the National Collegiate Athletic Association (NCAA) Injury Surveillance Program (ISP), which captures injury and exposure data for collegiate athletes participating in NCAA-sanctioned sports. The NCAA ISP began in the 1980s[2] and recently expanded its scope and improved its methods by integrating with electronic health records.[3] Many publications use NCAA ISP data to describe the frequency of injuries and injury mechanisms in individual sports,[4] resulting in dozens of peer-reviewed publications across a range of NCAA-sanctioned sports.[3,4] Thus far, investigation into the effects of school-level policies and procedures that can improve athlete injury outcomes has been limited. Schools decide on sports medicine staffing levels, models of administrative oversight and financing, and policies that govern return to sport, but relationships between these features and athlete health outcomes are not well understood.[5,6]

Combining approaches from health services research and data from injury-surveillance systems may yield new insights into ways to improve athlete health outcomes. From the standpoint of health services research, some institutional features can be regarded as structural indicators of health care quality. A structural measure of health care quality is "a feature of a health care organization or clinician related to the capacity to provide high-quality health care," such as the presence of an electronic health record, number of hospital beds, or level of clinician training.[7,8] Such measures are frequently used to evaluate health care delivery in hospital or outpatient contexts,[9,10] but their use has been more limited in the context of collegiate sports medicine. Possible structural measures in the collegiate sports medicine setting include the number and types of health care providers, budget allocated to sports medicine, and administrative or financial oversight models. Although structural quality features may be easy to measure, their relationship to health outcomes can sometimes be less clear and more difficult to quantify.[11]

The supply of health care providers is associated with injury outcomes in the sports medicine context. Authors[12,13] of recent research demonstrated variations in the numbers and types of sports medicine clinicians, relative to the number of athletes, across NCAA member schools. With additional work, researchers[14] suggested that both the ratio of clinicians to athletes and the relative number and types of clinicians were associated with the rates and types of injuries in a cohort of male, collegiate-level ice hockey players. In another study,[15] investigators found higher rates of injuries and recurrent injuries sustained by high school girls' soccer and basketball players at schools without an athletic trainer than at schools with an athletic trainer. Similarly, injury rates for high school football players varied based on whether they were cared for by an athletic trainer employed on a full-time or part-time basis.[5]

It may be that other structural features of the collegiate sports medicine environment affect athlete health care. For example, researchers[16] indicated that the supervisory and financial structures of sports medicine practices were associated with rates of premature return to play after a concussion. Specifically, sports medicine clinicians felt more pressure to return an athlete to play prematurely if they reported to the athletic department as opposed to an independent medical group.[16] Those authors observed that the independence of clinicians' medical decision making was affected by their employment structure. More broadly, it may be that financial or administrative oversight structures alter clinical practice, resource allocation, or clinical decision making in ways that influence injury outcomes, but our understanding of this relationship is limited. Other investigators[17] suggested that the time athletes spent recovering from a concussion was negatively correlated with the competitiveness of the sports program; that is, in more competitive divisions, athletes returned to play sooner. However, these studies relied on clinicians' self-reports, which may be subject to recall bias, making this an area ripe for further examination.

In this article, we evaluate the following structural measures of health care quality in the sports medicine context: (1) the number of clinicians per athlete at a school, (2) financial model of the sports medicine department, and (3) administrative reporting model of the sports medicine department. We then expand the current understanding of injury risk in collegiate sports by quantifying the relationship between these structural features of the sports medicine environment and the incidence of athlete injury, reinjury, concussion, and time loss (number of days an athlete was held out of practice or competition due to injury) by using a robust injury dataset derived from electronic health records.

Table 1. Team-Seasons of Data by Sport

Sport	Team-Seasons of Data	
	Men's	Women's
Baseball or softball	62	101
Basketball	129	135
Cross-country	46	42
Field hockey	—	24
Football	119	—[a]
Gymnastics	—	24
Ice hockey	106	50
Lacrosse	50	65
Soccer	86	133
Swimming	20	26
Tennis	26	37
Indoor track and field	31	32
Outdoor track and field	27	29
Volleyball	—	127
Wrestling	34	—

[a] Dash indicates either not available or not applicable.

METHODS

Data

We analyzed injury and exposure data from the NCAA ISP for the school years 2009–2010 through 2013–2014, obtained from its external investigator Data Injury Statistics Clearinghouse program. This dataset includes injury and athlete-exposure data for 25 sports (Table 1). Clinicians at some NCAA schools voluntarily provided data to the NCAA ISP through an interface with the electronic health records used by the school's sports medicine department.[3] Additional descriptions of the NCAA ISP data, collection procedures, and quality control are reported elsewhere.[3]

Our 3 primary outcomes were injury incidence, reinjury incidence, and time loss from sport due to injury. We measured 1 secondary outcome: concussion incidence. Our exposure measure was *athlete-exposures* (AEs), defined as "1 student-athlete participating in 1 NCAA-sanctioned practice or competition in which he or she was exposed to the possibility of athletic injury, regardless of the time associated with that participation."[3] This dataset includes all injuries, regardless of whether they resulted in the athlete's removal from sport participation.[3] Injury rates were calculated by summing the total number of injuries for each school-team-year and dividing by the total AEs for that same subgroup. A reinjury was a classification provided by the diagnosing clinician. Reinjury rates were calculated using clinician-classified reinjury at the school-team-year level, divided by total AEs. We used *time loss*, measured in days and defined as "the time between the original injury and return to play at the level that would allow competition participation."[3] Time loss (in days) was summed at the school-team-year level. Concussion rates were calculated by summing concussions at the school-

team-year level and using the same AE denominator as described earlier.

One of our independent variables of interest, clinicians per athlete, came from NCAA research data on sports medicine staffing for the same school years for which we have injury data (2009–2010 through 2013–2014). This information is gathered annually by the NCAA through a required sport sponsorship form filled out by a representative from each school. The ratio of clinicians per athlete was created by taking the total count of sports medicine clinicians at a given school during a given school year and dividing it by the number of participating athletes for that same school year.

Additional variables of interest, the model of financial oversight and the model of administrative oversight, came from a previous telephone survey of sports medicine departments at a subset of NCAA member institutions.[12] The *financial model* distinguishes between sports medicine groups that are financed by the athletics department versus another organizational unit (eg, university health services or an academic department). The *administrative oversight model* distinguishes between clinicians who report to the athletics department versus another organizational unit.

We also analyzed data that were publicly available through Title IX disclosures to the United States Department of Education and its Equity in Athletics Data Analysis.[18] Specifically, we measured athletic department resources by using gross athletic revenues for the same school years for which we had injury and staffing data (2009–2010 through 2013–2014). Participation data on the number of teams across sports were used to extrapolate our findings to the broader NCAA context.

Analysis

After reporting basic descriptive information about our data, we used regression to quantify the relationships among our 4 outcomes (injury, reinjury, time loss, and concussion) and our independent variable of interest (clinicians per athlete) at the sport-school-year level. We calculated Poisson models for injury and reinjury counts and included AEs as an offset term. We generated a zero-inflated Poisson model for time loss, using total injuries as an offset, because more than half of the injuries were not associated with time loss. We calculated a zero-inflated Poisson model for concussion, using total AEs as an offset, because concussion counts were heavily skewed toward zero. Because zero-inflated models were applied to account for the high proportion of zeros in the data, and not because we suspected 2 mechanisms for zero and nonzero outcomes, we generated an intercept-only model for the zero component of both zero-inflated Poisson models. All regressions controlled for sport, school, division of competition, and academic year. To account for the nonindependence of teams within the same school, in the Poisson models, school was included as a random effect. To assess the relationship between administrative and (separately) financial oversight models on injury outcomes, injury data were restricted to the subset of schools for which model information was available and Poisson regression was conducted. In this case, our independent variables were financial (or administrative) oversight model, clinicians per athlete, sport, and division of competition. The clinicians-per-athlete measure was standardized to a z score for ease of interpretation in the model.

To assess the generalizability of our results, we compared schools that provided data to the NCAA ISP with those that did not by using several structural descriptors. Independent 2-sample t tests compared continuous measures (total athletes, clinicians per athlete, and total athletic revenues) and χ^2 tests compared categorical measures (public versus private status, NCAA division of competition, financial and administrative oversight models) between groups.

RESULTS

Descriptive Statistics of the Sample

During the course of 3 570 053 games or practices in 25 sports at 141 schools over 5 academic years, 12 296 collegiate athletes experienced 25 203 injuries. Reporting clinicians categorized about 10% of the injuries (n = 2517) as reinjuries. More than half of the injuries (52%, n = 13 025) resulted in no time loss. Of the injuries that resulted in time loss, the median time was 6 days (interquartile range [IQR] = 3–12 days). A total of 1566 concussions were diagnosed.

Schools contributed various amounts of information to the NCAA ISP. Most schools contributed data for only 1 or 2 of the 5 years (57 schools = 1 year, 43 schools = 2 years, 10 schools = 3 years, 12 schools = 4 years, and 19 schools = 5 years). More schools participated in more recent years (2009–2010 = 53 schools, 2010–2011 = 58 schools, 2011–2012 = 51 schools, 2012–2013 = 81 schools, and 2013 and 2014 = 73 schools). A school could contribute data for any or all sports, leading to a range of total sport-seasons of injury data contributed by schools (IQR = 2–14 sport-seasons). Thus, some sports had significantly more seasons of injury information than others (Table 1), some teams had more years of contributed data, and the total number of injuries contributed by a given school ranged widely (IQR = 18–242 injuries) as did the number of AEs (IQR = 3197–13 998 AEs).

The school-level mean rate of injury in the sample overall was 103.5 per 10 000 AEs (Table 2). Rates of reinjury and concussion were 10.5 and 6.1 per 10 000 AEs, respectively. More than half of the injuries (57.7%) resulted in no time loss. Among those that resulted in time loss, the median time was 6 days.

Financial and Administrative Models

The financial and administrative oversight models for sports medicine were available for 70 of the 141 (49.6%) schools participating in the NCAA ISP. Of the schools with available model information, the majority of sports medicine groups were financed by (n = 55, 78.6%) and administratively overseen by (n = 57, 81.4%) the athletics departments at their institutions.

Clinician Case Load

The average number of athletes per clinician varied substantially, ranging from 24 to 891 (median = 118, SD = 100, IQR = 80–166 athletes). This variation stemmed from large ranges in both the number of total sports medicine clinicians (range = 1–28) and the number of athletes (range = 74–999) across schools.

Table 2. Descriptive Injury and Exposure Information From the National Collegiate Athletic Association Injury Surveillance Program for the School Years 2009–2010 Through 2013–2014

Measure	Median (Interquartile Range)				
	Injury	Reinjury	Time Loss, d	Concussion	Athlete-Exposures
Count					
School-year level count in sample	43 (18–97)	5 (1–10)	0 (0–1)	2 (0–6)	7077 (3196–13 998)
School-sport-year level count in sample	9 (4–18)	1 (0–2)	0 (0–2)	0 (0–1)	1714 (1214–2548)
Rate per 10 000 athlete-exposures					
School-year level rate of injury in sample	87.3 (58.1–117.1)	7.3 (2.6–12.9)	6 (3–12)[a]	4.8 (2.5–8.6)	

[a] This is the mean time loss for injuries resulting in time loss. Overall, median time loss was 0 days, and mean time loss was 5.03 days (interquartile range = 0–4 days).

Relationship Between Staffing and Injury

We found significant associations between clinicians per athlete and injury rates, reinjury rates, time loss, and concussion rates (Table 3). Schools that had 1 SD above the average number of clinicians per athlete had a 9.5% lower rate of injuries (103.6 versus 93.7 per 10 000 AEs; incidence rate ratio [IRR] = 0.905, $P < .001$), 2.7% lower rate of reinjuries (10.6 versus 10.3 per 10 000 AEs; IRR = 0.973, $P = .004$), and 6.7% lower rate of concussion (6.1 versus 5.7 per 10 000 AEs; IRR = 0.933, $P < .001$). Schools that had 1 SD above the average number of clinicians per athlete had 16% more days of time loss (5.0 versus 4.2; IRR = 1.16, $P < .001$).

Relationship Among Model, Staffing, and Injury

We observed significant associations between financial and administrative oversight models, staffing, and overall injury rates (Table 4). Schools in which the sports medicine team was financed by the athletics department had higher rates of injury than those in which financing was from other departments (unadjusted = 140.5 versus 110.6 per 10 000 AEs). Similarly, schools in which the sports medicine team administratively reported to the athletics department had higher rates of injury than schools in which clinicians reported to other departments (unadjusted = 141.5 versus 108.3 per 10 000 AEs). Controlling for staffing, sport, and division of competition, sports medicine groups that were financed by the athletics department were associated with a 31% higher incidence of injury than those financed by other departments (IRR = 1.31, $P < .001$). Similarly, controlling for staffing, sport, and division of competition, sports medicine groups that reported administratively to the athletics department were associated with a 9% higher incidence of injury than those reporting to other departments (IRR = 1.09, $P < .001$). The relative effect of staffing on injury increased when examined in conjunction with either the financial model or administrative oversight model. Holding the financial model constant, schools with 1 SD more clinicians per athlete had a 41% lower incidence of sport-related injury than schools with an average number of clinicians per athlete (IRR = 0.59, $P < .001$). Similarly, holding the administrative model constant, schools with 1 SD more clinicians per athlete had a 42% lower incidence of sport-related injury than schools with an average number of clinicians per athlete (IRR = 0.58, $P < .001$; Table 4).

Generalizability of Sample

Schools that contributed injury information to the NCAA ISP tended to have more athletes, more clinicians per athlete, and higher total athletics revenues and more frequently reported administratively to the athletics department, were less frequently financed through the athletics department, and more often classified as Division 1 (Table 5). Schools for which we had model information had a higher average injury incidence than NCAA ISP schools overall (129.1 versus 103.5 per 10 000 AEs; IRR = 1.25).

DISCUSSION

Using data from a wide range of men's and women's sports, we determined that the number of clinicians per athlete was associated with the rates of injury, reinjury, concussion, and time loss. We also noted an association between the financial and administrative oversight models of the sports medicine departments and the incidence of injury. With these results, we provide an important initial indication that, as in other areas of health care, structural features in the sports medicine environment may be indicators of health care quality and patient outcomes. Our findings are in line with a previous report[15] of higher rates of injury and recurrent injury in high school girls' basketball and soccer when an athletic trainer was present versus not present. However, they are in contrast with the lower rate of diagnosed concussion when athletic trainers were not present.[15] In our sample of colleges, at least 1 health care provider was always available; thus, this difference may reflect the relative and absolute availability of health care providers and the subsequent effects on athlete health outcomes. Further application of the tools and

Table 3. Results of Regressions Evaluating the Relationship Between the Ratio of Clinicians to Athletes and Injury Outcomes

Measure	Incidence Rate Ratio[a] (*P* Value)			
	Injury Rate	Reinjury Rate	Time Loss, d	Concussion Rate
Clinicians per athlete[b]	0.905 (<.001)	0.973 (.004)	1.16 (<.001)	0.933 (<.001)

[a] Incidence rate ratios were derived from Poisson regression (injury rate, reinjury rate) or zero-inflated Poisson regression (time loss, concussion rate). All regressions controlled for division, school, sport, and year.

[b] Variable was standardized. Example interpretation: compared with schools that had 1 SD below the average number of clinicians per athlete, the average school had 0.905 times the injuries (or 9.5% fewer injuries).

Table 4. Associations Between Financial and Administrative Oversight Models, Ratio of Clinicians per Athlete, and Injury Outcomes in Collegiate Athletes, 2009–2010 Through 2013–2014 School Years[a]

Measure	Incidence Rate Ratio (*P* Value)	
	Model 1: Financial	Model 2: Administrative
Clinicians per athlete[b]	0.59 (<.001)	0.58 (<.001)
Financed by athletics	1.31 (<.001)	
Report to athletics		1.09 (<.001)

[a] Results of 2 separate Poisson regressions. The outcome variable was injury count, offset by exposure count; variables of interest were clinicians per athlete, financial model, and, separately, administrative model. Regressions controlled for sport and division of competition.

[b] Variable was standardized. Example interpretation: compared with schools that had 1 SD below the average number of clinicians per athlete, the average school has 0.59 times the injuries (or 41% fewer injuries), controlling for other model variables.

frameworks from health services research to the sports medicine context will likely advance our understanding of the factors contributing to athlete health outcomes.

To our knowledge, we provide the first empirical evidence relating sports medicine departments' supervisory and financial models with athlete health outcomes. Previous investigators concluded that variations in staffing[12] and differences in legal risks[19] were associated with the financial model and reporting structure. Beyond the legal risks, we suggest that health risks are associated with structuring a sports medicine group's administrative and financial oversight through the athletics department. Given the nature of our study, we cannot say that this relationship is causal. However, this finding does add to the legal, ethical, staffing, and professional reasons against structuring sports medicine departments administratively and financially under an athletics department.[12,19–21]

Schools with more clinicians per athlete had modestly lower rates of injury. However, the large number of collegiate athletes implies that even a modest relationship could have large overall health effects. For example, a 9.5% reduction in the overall injury count in this sample equates to 2394 fewer injuries, limited only to the teams included in the dataset during the 5-year study period. Extrapolated to the broader NCAA context, this corresponds to an annual reduction of about 14 015 injuries for only the sports included in the data, which represent a fraction of the total NCAA-sanctioned sports. This relationship was strengthened when the financial or administrative oversight model was included in the analysis.

The relationship between the number of clinicians per athlete and injury rates likely reflects several mechanisms. Collegiate sports medicine clinicians participate in injury-prevention programs, which could influence injury rates. Higher staffing levels in a collegiate sports medicine department could also indicate broader positive attitudes toward athlete health at the school, which translates into practices across the athletic environment that help reduce injury rates. For example, researchers[12] demonstrated that schools whose sports medicine departments were financed by or reported to a medical institution had a greater ratio of clinicians to athletes. Conversely, it is possible that documentation practices vary by staff size. For instance, more clinicians may translate to better reporting or documenting of injuries. Given that our outcomes were all diagnosed injuries (documented in the medical record), if documentation improves as staff size increases, we may be underestimating the effect size of staffing on athlete injury outcomes.

Sports medicine staff may have an even more direct influence on rates of reinjury, which are affected by the clinical management of initial injuries.[22] We showed that schools with more clinicians per athlete had lower rates of reinjury. Reinjury rates may be lower in schools with more clinicians per athlete because the initial injuries are cared for more frequently and attentively. Although we lack data on the treatment of these injuries, this hypothesis is further

Table 5. Descriptive Characteristics of Schools That Did or Did Not Contribute Data to the National Collegiate Athletic Association Injury Surveillance Program

Measure	Schools Contributed Data?		Test Statistic
	Yes	No	
Total schools, No.[a]	141	981	
	Mean ± SD		*t* Value (*P* value)
Total athletes, No.	513 ± 201	399 ± 176	−13.97 (<.001)
Clinician patient load, No.[b]	139 ± 100	145 ± 88	2.78 (.005)
Total athletics revenues[b] (millions of US dollars)	15.9 ± 25.2	10.6 ± 19.7	−4.05 (<.001)
	No. (%)		χ^2 Value (*P* Value)
Private schools	79 (57)	558 (58)	0.04 (.83)
National Collegiate Athletic Association division of competition			65.26 (<.001)
I	60 (43)	281 (29)	
II	23 (16)	302 (31)	
III	59 (42)	398 (41)	
Financed by athletics[c]	55 (79)	256 (85)	8.29 (0.004)
Overseen by athletics[c]	57 (81)	227 (76)	5.15 (0.02)

[a] Data were not available for all variables for all schools in the analyses.

[b] Due to distribution, the data were log transformed for analysis. Raw means and SDs are presented.

[c] Total number of schools with model information = 370, 70 of which contributed data to the Injury Surveillance Program and 300 of which did not.

supported by our finding that athletes at schools with more clinicians per athlete lost more time to injury. Although time loss due to injury can indicate injury severity, greater time loss can also reflect a more conservative approach to injury management. Additional support was provided by researchers[5] who demonstrated that medical services per high school football injury increased when the athletic trainer was employed full time by the high school as opposed to full or part time by an outreach organization.

Average case loads for clinicians in this sample ranged from 24 to 891 athletes, and in the NCAA staffing data overall, the range was even greater, from 24 to 955 athletes. This signals a significant disparity in access to care for collegiate athletes and workloads for collegiate sports medicine clinicians. This differential workload may have a negative effect on clinicians as well as athletes. Insufficient staffing is associated with more job dissatisfaction, diminished work-life balance, and burnout among sports medicine clinicians.[23–25] This may also affect clinician performance; for example, insufficient staffing of the sports medicine department may impede the implementation of concussion-related care policies.[6,26] Future work to establish benchmarks for appropriate clinician case loads is warranted; until then, institutions whose clinicians care for a relatively large number of athletes (for example, those above the 75th percentile of 166 athletes per clinician) may consider measures to reduce case loads to reduce the risk of injury in athletes.

Limitations

Our structural measure of the number of clinicians per athlete does not distinguish among levels of credentialing, full-time equivalents, or allocation of clinicians across sports within a school. In addition, injury data are voluntarily contributed to the NCAA ISP. Not all schools provide data, and those that do typically do not provide data for all sports, which may limit the generalizability of our conclusions, especially given the measurable differences between participating and nonparticipating schools we found. This study included only NCAA schools and, therefore, the conclusions may not be generalizable to institutions outside of the NCAA. Injury-reporting practices may vary across schools in unobservable ways. As noted earlier, understanding the mechanisms underlying the relationship between sports medicine staffing and injury outcomes requires additional research.

CONCLUSIONS

Based on our data, we suggest that increasing the number of sports medicine clinicians on staff and changing the financial and administrative reporting structures of sports medicine groups may improve the health of collegiate athletes by reducing injury rates. Future research addressing medical services and costs would enhance our understanding of the effectiveness and cost-effectiveness of increasing the number of clinicians in the collegiate sports medicine environment.[27] Additional evaluation of features that influence injury rates across sports has the potential to provide widespread positive health outcomes for collegiate athletes. As the relationships among sports medicine staffing, model of care, and athlete health outcomes are clarified, schools, conferences, and leagues will be increasingly well positioned to intervene to improve athlete health.

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