

## [ Primary Care ]

# National Collegiate Athletic Association Division I Athletes' Use of Nonprescription Medication

Douglas A. Wolf, MS, ATC, CSCS,\* Thomas W. Miller, PhD, ABPP,†  
Linda S. Pescatello, PhD, FACSM,† and Christopher Barnes, PhD†

**Background:** Athletes are known to use over-the-counter pain medication. However, the frequency of such use among National Collegiate Athletic Association (NCAA) Division I-A football athletes is unknown.

**Hypothesis:** NCAA Division I-A football athletes who use nonprescription analgesics for pain misuse these medications.

**Study Design:** Cross-sectional study.

**Methods:** The football players (N, 144) who met the criteria and agreed to participate were from 8 NCAA Division I-A schools. The participants were administered the Over the Counter Drug Screen for Athletes, which measures attitudes toward the use of a spectrum of substances.

**Results:** Among football athletes surveyed who took nonprescription analgesics for football-related pain, 37% reported taking more than the recommended dose. This was slightly higher than the 28% of players who stated they have not taken nonprescription analgesics for football-related pain. Thirty-four percent of all athletes reported using more than the recommended dose of nonprescription analgesics. Athletes who purchased their own nonprescription analgesics communicated poorly regarding nonprescription analgesics use. Those lacking knowledge about nonprescription analgesics and those using nonprescription analgesics in anticipation of pain or to avoid missing a practice or game were most likely to misuse nonprescription analgesics.

**Conclusion:** NCAA Division I-A football athletes who use nonprescription analgesics for athletic competition do not misuse nonprescription analgesics.

**Keywords:** nonsteroidal anti-inflammatory drugs, nonprescription, analgesics, football-related pain, abuse

Approximately 60% of all medications used in the United States are nonprescription medications.<sup>2</sup> Three in 5 Americans have used a nonprescription medication in the past 6 months,<sup>12</sup> with 78% using them to alleviate pain.<sup>6</sup> Athletes' use of drugs has received widespread public concern.<sup>1,2,8,10,13,15</sup> The purpose of this study was to examine the use of nonprescription analgesics by National Collegiate Athletic Association (NCAA) Division I-A football athletes and the factors related to their use.<sup>1,17,19</sup> Nonprescription analgesics include aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs (NSAIDs), which include ibuprofen, ketoprofen (Orudis), and naproxen sodium. More than 150 products contain nonprescription analgesics, either alone or in combination with other nonprescription medications.<sup>3</sup> More than one-half of NCAA Division I athletes use nonprescription analgesics<sup>4</sup>; however, the use of these

medications in the athletic population has been scarcely investigated. Preliminary evidence indicates that athletes may be putting themselves at risk by improperly using nonprescription analgesics.<sup>1,16,20,21</sup> Some nonprescription analgesics may cause side effects such as nausea, vomiting, stomach pain, and heartburn.<sup>14</sup>

Football athletes may be at the greatest risk of nonprescription analgesics misuse because of the intense physical demands of the sport. Notably, 75% of high school football players surveyed reported using NSAIDs in the previous 3 months because of the pain involved in this contact sport, and one-half reporting using NSAIDs on a daily basis.<sup>21</sup> Of all NCAA sports, football is responsible for the greatest number of game injuries, with 33.9 injuries occurring per 1000 exposures.<sup>22</sup> This figure is 8.1% higher than that of wrestling, the sport with the second-highest rate for game injuries per exposure.<sup>22</sup>

From the \*Nationwide Children's Hospital, Columbus, Ohio, and the †University of Connecticut, Storrs, Connecticut

†Address correspondence to Thomas W. Miller, PhD, ABPP, Professor Emeritus and Senior Research Scientist, University of Connecticut, 3237 Saxon Drive, Lexington, KY 40503 (e-mail: tom.miller@uconn.edu).

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## METHODS

### Sample

Institutional review board approval was obtained for this study. NCAA Division I-A football athletes (n, 1155) and 51 NCAA Division I-A institutions were invited to participate in this study through their respective department of athletics and head athletic trainer. Efforts to obtain a representative sample and reduce selection bias were made by 3 follow-up contacts with institutions not initially responding to invitations to participate. The criteria for athlete inclusion were an age of at least 18 years and having been on an active roster of a NCAA Division I-A football team for at least 1 football season. A football season was defined as 10 games.

From the NCAA list of accredited colleges, 51 institutions were randomly selected for inclusion in the study; 38 responded to the invitation; and 10 agreed to participate. Two of the final 10 were eventually excluded because an NCAA faculty sponsor could not be obtained to satisfy the institutional review board requirements. This draw provided a representative sample of NCAA Division I-A football players (N, 144) from 8 NCAA Division I-A football programs.

### Measure

The Over the Counter Drug Screen for Athletes,<sup>22</sup> a 23-item survey measure with multiple subsets of questions, was used to assess the overall use of substances by athletes. A 4-point Likert-type scale was used to assess the degree to which athletes used medications and their frequency of use. The development, standardization, validity, and reliability data have been reported elsewhere.<sup>22</sup> The dependent variables were nonprescription analgesics use in NCAA Division I-A football players, dose, and consecutive days of use. The independent variables were demographic characteristics (Table 1), reasons for use, communication and interaction with physicians, athletic staff and pharmacists, source, knowledge, and attitudes about nonprescription analgesics. Misuse was defined as taking a nonprescription medication in an amount greater than recommended or for a duration longer than that recommended by the label.

### Statistical Analysis

Frequencies were obtained for all data, including mean and standard deviation for age. Chi-square was used to determine significant differences in the dose of nonprescription analgesics and consecutive days taken (Table 2). Statistical analysis was performed with the SPSS 12.0. The alpha level was set at  $P < .05$ .

## RESULTS

The results suggest that of those football athletes who took nonprescription analgesics for football related pain, 37% reported using more than the recommended dose. Among the athletes who indicated that they had taken nonprescription

Table 1. Demographic characteristics of the study sample.<sup>a</sup>

	%
<b>Ethnicity</b>	
Black	54
White	42
Some other ethnicity	4
<b>Athletic year</b>	
Sophomore	27
Junior	22
Red-shirt freshman	15
Senior	14
Freshman	13
Fifth-year senior	9
<b>Scholarship status</b>	
Athletic scholarship	73
Nonathletic scholarship	12

<sup>a</sup>n, 139. Age: 20.2 ± 1.2 years.

Table 2. Nonprescription analgesics misuse.

Misuse	n	$\chi^2$	P
Used more than the recommended dose	133	1.01	0.03
Used longer than 10 consecutive days	137	0.08	0.08

analgesics for football-related pain, 7% used nonprescription analgesics for more than 10 consecutive days, indicating some misuse of the medication.

Seventy-three percent of participants reported using nonprescription analgesics for football-related pain the previous season. Athletes who primarily play on offense were more likely to use nonprescription analgesics (85%), compared with special teams, kickers, and punters (75%) or defensive players (59%) ( $P = 0.05$ ). NCAA Division I-A football players with more years of football experience were also more likely to use nonprescription analgesics than those with less experience ( $P = 0.10$ ). Seventy-five percent of white football players and 69% of black football players used nonprescription analgesics. More than 8 in 10 (83%) NCAA Division I-A football players who were of an ethnicity other than white or black used nonprescription analgesics.

Most athletes participating in this study reported the use of ibuprofen (80%), followed by aspirin (71%), acetaminophen (29%), naproxen sodium (20%), and ketoprofen (3%). A small number (7%) reported using some other nonprescription analgesics. Athletes who responded to this survey demonstrated a low level of awareness of the active ingredient in nonprescription analgesics. When asked what brand of nonprescription analgesics they used, most players reported a brand of the active ingredient acetaminophen. In contrast, when asked what active ingredient they used, most players reported having used ibuprofen, not acetaminophen.

The majority reported using nonprescription analgesics for less than the label-recommended 10 consecutive days (94%), whereas only 6% used nonprescription analgesics for more than 10 consecutive days or every day. However, 78% of the athletes who used nonprescription analgesics for more than 10 consecutive days thought that they could take nonprescription analgesics as long as they wanted, thereby indicating a lack of awareness or disregard of the label-recommended 10-day limit.

Sixty-five percent used the recommended dose of nonprescription analgesics or less than the recommended dose, whereas 35% used more than the recommended dose. Fifty-nine percent of white athletes used the recommended dose of nonprescription analgesics, compared with 16% of black football players. Kickers, punters, and special teams players were more likely to use more than the recommended dose than any other position ( $P = 0.02$ ).

Thirty-six percent of the athletes who reported using more than the recommended dose believed that more of nonprescription analgesics would relieve pain faster. Most athletes (89%) used more than the recommended dose because they believed that football players required more because they are larger than the average population.

### Nonprescription Analgesics Label Reading

Approximately one-fourth of the athletes indicated that they read nonprescription analgesics labels every time they used nonprescription analgesics. Twenty-two percent reported reading them before the first use only, and 15% never read label directions.

Football athletes who did not read label directions were more likely to use more than the recommended dose (43%) (Figure 1). Those who never read labels were more likely to use nonprescription analgesics for more than 10 consecutive days.

### Origin of Nonprescription Analgesics

The majority of NCAA Division I-A football players decided themselves to use nonprescription analgesics (64%). Twenty-four percent used nonprescription analgesics when a certified athletic trainer (ATC) deemed it appropriate; 7%, at the recommendation of a physician; and 6% let a parent, teammate, or coach decide when they should use these medications.

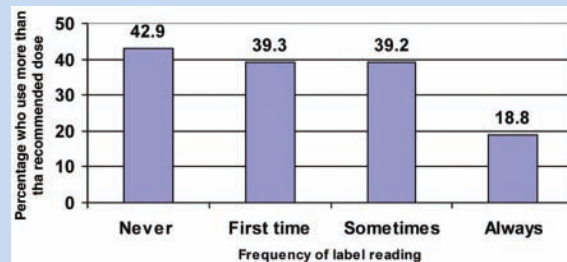


Figure 1. Percentage of respondents who read label directions and used more than the recommended dose (n, 132).

Forty-seven percent of the athletes purchased nonprescription analgesics for themselves rather than obtain them from a certified athletic trainer (29%), pharmacist (8%), physician (3%), or other (13%). Those who purchased medications for themselves were more likely to use more than the recommended dose (51%).

### Reasons for Nonprescription Analgesics Use

Forty-one percent of the athletes reported using nonprescription analgesics in anticipation of pain, whereas 31% used them to avoid missing a practice or game. Starters were also more likely to take nonprescription analgesics to avoid missing a practice or game.

### Communication Related to Nonprescription Analgesics

Sixty-one percent of the athletes were instructed on proper use of nonprescription analgesics every time they obtained them from a team physician. Fifteen percent were instructed sometimes; 13% were never instructed; and 11% were instructed the first time only. Those not instructed every time were more likely to use more than the recommended dose.

A few respondents (8%) stated that a team physician recommended more than the recommended dose, whereas 6% did not know the recommended dose. Most NCAA Division I-A football players sought advice regarding nonprescription analgesics, from either a certified athletic trainer (63%) or a team physician (28%). Players who used nonprescription analgesics for football-related pain were more likely not to notify a team physician or certified athletic trainer. Those who used nonprescription analgesics to avoid missing a practice or game ( $P = 0.01$ ) or who thought that they were safer than prescription medications ( $P = 0.07$ ) were more likely to not notify the athletic staff.

## DISCUSSION

NCAA Division I-A football athletes use nonprescription analgesics at a rate greater than that of the general population

and other NCAA Division I athletes.<sup>4</sup> Forty-seven percent of Americans over the age 18 years have used nonprescription analgesics in the past 6 months.<sup>2</sup> Use of nonprescription analgesics among NCAA Division I-A football athletes is similar to that of high school football players. Seventy-five percent of high school football athletes reported having used NSAIDs in the previous 3 months.<sup>5</sup> Most respondents used nonprescription analgesics properly; only 6% used nonprescription analgesics for longer than 10 consecutive days. One-half of high school football players who reported using NSAIDs used nonprescription analgesics every day.<sup>7</sup> One in 3 NCAA Division I-A football athletes surveyed in this study used more than the recommended dose, at the same rate as the general population. Four percent of NCAA Division I-A football players reported not knowing the recommended dose. Unintentional overuse can result from a misconception of the recommended dose.<sup>7</sup> Eighty-nine percent of NCAA Division I-A football players believe football players require more nonprescription analgesics because the players are larger than the general population. Doses based on body weight should be used only for children.<sup>18</sup>

Lack of instruction by the team physician increases the likelihood that an athlete will use more than the recommended dose of nonprescription analgesics.<sup>15,19,20</sup> Athletes who use more than the recommended dose and those who use medication to avoid missing a practice or game are both more likely not to inform a team physician about their analgesic use.

Education and training of coaches, athletic training staff, athletes, and physicians may help to improve the patterns of nonprescription analgesics use by football athletes at the Division I-A level. Although the accuracy of the responses may be questionable, inquiring about nonprescription analgesics use on preparticipation physical examinations would provide the sports medicine staff the opportunity to educate the athlete on the risks and benefits of nonprescription medication use for pain in athletic competition.

## CONCLUSION

The results of this study provide understanding of the patterns of nonprescription analgesics use by NCAA Division I-A football athletes. Athletes misuse nonprescription medication when (1) there is poor communication regarding nonprescription analgesics use between the athlete and the coaching and athletic training staff, (2) when the athlete has limited knowledge and beliefs about nonprescription analgesics, and (3) when the athlete anticipates pain or wants to avoid missing a practice or game because of anticipated or real pain experiences.

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