

**ORIGINAL RESEARCH**

# Factors Associated with Time Spent Practicing Sports Medicine by Those with a Certificate of Added Qualification

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**Purpose:** To determine those factors associated with family physicians certified in sports medicine (SM-FPs) devoting 75% or more of their professional time to the exclusive practice of sports medicine.

**Methods:** Data from the American Board of Family Medicine sports medicine examination registration questionnaires from 2003 to 2017 were analyzed. The characteristics of SM-FPs devoting 75% or more of their time to sports medicine were compared with those SM-FPs spending less than 75% time. Multiple regression analysis was used to determine characteristics that independently predicted devoting 75% or more of their professional time to the practice of sports medicine.

**Results:** One thousand one hundred twelve SM-FPs recertifying in sports medicine between 2003 to 2017 were studied. They were predominately male (85.2%), allopathic (91.7%) physicians with a mean age of 47.3 years (interquartile range (IQR), 42.1-54.2) and devoted a median 50% of their professional time (IQR, 25-80) to sports medicine. Age less than 47.3 years (odds ratio (OR), 1.53; 1.12-2.08), service as a collegiate team physician (OR 1.66; 1.10-2.50), recertification in sports medicine in 2011 to 2017 compared with earlier years (OR 2.47; 1.62-3.78), and practicing in a sports medicine clinic (OR, 6.43; 4.15-9.95) predicted greater odds of spending 75% or more of their time devoted to sports medicine.

**Conclusions:** Those factors found to be associated with spending 75% or more of their time practicing sports medicine by SM-FPs seem to be consistent with recent trends in the recruitment and employment of these physicians and their ability to provide added value to the health care system by virtue of their additional training and expertise. (J Am Board Fam Med 2021;34:189-195.)

**Keywords:** Certification, Family Medicine, Family Physicians, Primary Health Care, Regression Analysis, Sports Medicine, Surveys and Questionnaires

## Introduction

The American Board of Family Medicine (ABFM) application for the creation of the subspecialty of sports medicine was approved by the American Board of Medical Specialties in 1989, and the ABFM certified its first sports medicine diplomats by examination in 1993.<sup>1</sup> The subspecialty has

grown significantly since its establishment with more than 2400 family physicians currently certified in sports medicine; nearly 60% of these physicians (n = 1373) have been certified in the past 10 years.<sup>2</sup> Correspondingly, the number of Accreditation Council for Graduate Medical Education (ACGME) accredited sports medicine fellowship programs sponsored by family medicine has increased by 50% during the past decade to now total 151 programs that graduate approximately 135 fellows per year who are eligible for certification by the ABFM.<sup>3</sup> The demonstrable increases in both the number of accredited training programs and the number of sports medicine physicians they produce are most likely in response to the increased demand for family physicians certified in sports medicine who can provide enhanced levels of secondary care in the treatment of musculoskeletal injuries, as well as non-

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musculoskeletal conditions, that may affect athletes and those who exercise.<sup>4</sup>

A study published in 2008 characterized the practice patterns of family physicians holding subspecialty certification in sports medicine (SM-FPs) and reported that 58.3% of those surveyed were in private practice and 41.7% practiced in an academic setting.<sup>5</sup> Nearly one third (31.5%) of these physicians practiced exclusively in a sports medicine setting, while 28.5% reported practicing in a combined sports medicine and family medicine practice, 22.1% practiced exclusively in a family medicine practice, and 17.8% in other practice arrangements. In 2015, we found that most SM-FPs spend 50% of their time or less practicing sports medicine; however, the number of SM-FPs observed to be spending 50% or more of their time increased significantly from 2005 to 2015.<sup>1</sup>

To date, no study has explored the factors that are associated with SM-FPs devoting increasing amounts of time to the practice of sports medicine. Given the growth in sports medicine fellowship positions, the demand for SM-FPs, the changes in the health care system, and the increase in the number of SM-FPs practicing SM exclusively, understanding the characteristics associated with SM-FPs spending the majority of their time practicing sports medicine may be important. We therefore sought to describe the demographics, practice settings, team physician status, and practice characteristics of SM-FPs spending 75% or more of their time practicing sports medicine and compared them to those SM-FPs spending less than 75% of their time doing so.

## Methods

All data were obtained from ABFM administrative databases. ABFM data included routine demographic information such as date of birth, type of medical degree, gender, and examination results. Current certification status as of February 07, 2018 was obtained as well. All data were linked to an ABFM identification code, but all data were deidentified during analysis.

Information regarding practice in sports medicine was obtained from the sports medicine examination registration questionnaire. These questionnaires are a mandatory component of examination registration, achieving a 100% response rate, and are completed 3 to 4 months before the examination date.<sup>6</sup> This questionnaire underwent revisions in 2014 and 2017.

Topics covered in all years were percentage of time spent practicing sports medicine, main area of focus in sports medicine, practice size, participation in a sports medicine clinic, and team physician status.

We used responses to the question, “Percentage of your professional time involving sports medicine” to create the primary outcome variable. The distribution of the variable was skewed, and we therefore dichotomized diplomates into those who reported spending a large majority of their time in sports medicine as 75% or greater versus those spending less than 75%. Questions regarding practice size changed in 2014, but we were able to create a practice size variable to reflect solo practice, small (2 to 20 providers in 2014 and 2015, 2 to 10 in 2004 to 2013), large (21 or more providers in 2014 and 2015, 11 or more in 2004 to 2013), and other. Focus of time spent in sports medicine was a categorical response question from 2004 to 2013 but in 2014 through 2017 it asked diplomates to enter a percentage of time in each of the 4 categories (direct patient care, teaching, administration, research). We combined these into 1 variable by assigning the main area to that with the highest percentage in 2014 and 2015. Over the years there were multiple questions on faculty status in either medical school, residency, or fellowship. These were combined into a single variable that was coded “yes” if there was a positive response to any of the faculty questions in any year. The level of team physician question changed in 2017 from a single response to a select-all-that-apply question. We coded new variables indicating a positive response to each option for any year.

All data were combined into a single analytic file. We retained data from the most recent successful examination for recertification candidates. Descriptive statistics were used to characterize the sample and variables. We then used Chi-Square and Mann-Whitney tests to test for differences in demographic and practice characteristics associated with spending 75% or greater time in sports medicine. Finally, we ran logistic regression models to determine adjusted associations between physician demographic and practice characteristics with practicing 75% or more of their time in sports medicine. We only included variables in the model that were significant in bivariate analysis. Due to the skewed distribution of age, we created a dummy variable indicating age less than the median age of the entire sample for the regression model. To

assess for a possible increase in concentration of time in sports medicine among more recent recertification examinees, we created a variable indicating that the last examination was taken between 2011 and 2017. All analyses were conducted using SAS v9.4 (SAS Institute, Cary, NC).

### Ethical Considerations

The American Academy of Family Physicians Institutional Review Board approved this study.

### Results

For the 15-year study period from 2003 to 2017, 1112 candidates successfully passed the sports medicine recertification examination. The characteristics of these physicians are shown in Table 1. They were predominately male (85.2%), allopathic (91.7%) physicians with a mean age of 47.3 years (IQR, 42.1-54.2) and devoted a median 50% of their professional time (IQR, 25-80) to sports medicine. The practice settings of these physicians varied with 10.1% (n=112) in solo practice, 38.3% (n=425) in small practices, 22.2% (n=246) in large practices, and 29.4% (n=326) indicating other types of practice arrangements. The overwhelming majority of these physicians (n=1001; 90.1%) spent most of their time in direct patient care, and 60.8% (n=674) indicated that they held faculty appointments. 856 physicians (76.9%) indicated that they served as team physicians with the majority serving at either the collegiate (n=380; 44.4%) and/or high school level (n=341; 39.8%). A majority (n=662; 62.5%) practiced in a specifically designated sports medicine clinic, and 356 physicians (32.0%) spent 75% or more of their professional time devoted to sports medicine.

Bivariate analysis compared SM-FPs spending less than 75% of their time devoted to sports medicine with those spending 75% or more time (Table 2) and revealed they were significantly younger (44.1 vs 48.0 years;  $P \leq .001$ ), more recently recertified in sports medicine ( $P \leq .001$ ) and more likely to have ABFM primary certification in 2018 (94.9% vs 83.3%;  $P \leq .0001$ ). More also spent most of their time in direct patient care (94.1% vs 88.6%;  $P = .035$ ), participated in a sports medicine clinic in greater numbers (89% vs 49%;  $P \leq .0001$ ), and were more likely to be collegiate team physicians (54.6% vs 34.1%,  $P \leq .0001$ ).

**Table 1. Characteristics of American Board of Family Medicine Sports Medicine Certificate of Added Qualification (CAQ) Diplomates When Registering for the Sports CAQ Examination, 2003–2017 (n = 1112)**

| Variable   | N (%)            |
|--|------------------|
| Median (IQR) age at time of most recent exam                           | 47.3 (42.1–54.2) |
| MD   | 1020 (91.7)      |
| Male gender  | 948 (85.2)       |
| Most recent exam year  |                  |
| 2003   | 39 (3.5)         |
| 2004   | 15 (1.4)         |
| 2005   | 24 (2.2)         |
| 2006   | 8 (0.7)          |
| 2007   | 42 (3.8)         |
| 2008   | 16 (1.4)         |
| 2009   | 138 (12.4)       |
| 2010   | 10 (0.9)         |
| 2011   | 104 (9.4)        |
| 2012   | 77 (6.9)         |
| 2013   | 176 (15.8)       |
| 2014   | 109 (9.8)        |
| 2015   | 106 (9.5)        |
| 2016   | 99 (8.9)         |
| 2017   | 149 (13.4)       |
| Certified with ABFM in February 2018                                   | 968 (87.1)       |
| Faculty (n = 1109)   |                  |
| Yes  | 674 (60.8)       |
| No   | 435 (39.2)       |
| Practice size  |                  |
| Solo   | 112 (10.1)       |
| Small  | 425 (38.3)       |
| Large  | 246 (22.2)       |
| Other  | 326 (29.4)       |
| Professional time devoted to sports medicine, median (IQR)             | 50 (25–80)       |
| Greater than 75% of their professional time devoted to sports medicine | 356 (32.0)       |
| Most time in sports medicine devoted to (n = 1108)                     |                  |
| Administration   | 31 (2.8)         |
| Direct patient care  | 1001 (90.3)      |
| Research   | 4 (0.4)          |
| Teaching   | 72 (6.5)         |
| Participates in an organized sports clinic                             | 662 (62.5)       |
| Team physician level (n = 856)   |                  |
| Adolescent   | 341 (39.8)       |
| Child  | 34 (4.0)         |
| Collegiate   | 380 (44.4)       |
| International/amateur  | 68 (8.0)         |
| Professional   | 124 (14.5)       |

IQR, interquartile range; ABFM, American Board of Family Medicine.

**Table 2. Characteristics of American Board of Family Medicine Sports Medicine Certificate of Added Qualification Diplomates, 2003–2017 by Time Spent in Sports Medicine (n = 1112)**

| Characteristic                                     | Spends Greater than 75% Time in Sports Medicine (n = 356) | 75% or Less Time in Sports Medicine (n = 756) | P-Value |
|--|---|---|---------|
| Median age (IQR) at Time of most recent exam       | 44.1 (41.5–51.3)  | 48.0 (42.3–54.9)                              | < .001  |
| MD   | 316 (88.8)  | 704 (93.1)                                    | .014    |
| Male gender  | 301 (84.6)  | 647 (85.6)                                    | .65     |
| Most recent exam year                              |   |   | < .001  |
| 2003   | 0 (0.0)   | 39 (100.0)                                    |         |
| 2004   | 1 (6.7)   | 14 (93.3)                                     |         |
| 2005   | 2 (8.3)   | 22 (91.7)                                     |         |
| 2006   | 0 (0.0)   | 8 (100.0)                                     |         |
| 2007   | 5 (11.9)  | 37 (88.1)                                     |         |
| 2008   | 6 (37.5)  | 10 (62.5)                                     |         |
| 2009   | 26 (18.8)   | 112 (81.2)                                    |         |
| 2010   | 0 (0.0)   | 10 (100.0)                                    |         |
| 2011   | 43 (41.4)   | 61 (58.7)                                     |         |
| 2012   | 27 (35.1)   | 50 (64.9)                                     |         |
| 2013   | 67 (38.1)   | 109 (61.9)                                    |         |
| 2014   | 41 (37.6)   | 68 (62.4)                                     |         |
| 2015   | 33 (31.1)   | 73 (68.9)                                     |         |
| 2016   | 42 (42.4)   | 57 (57.6)                                     |         |
| 2017   | 63 (42.3)   | 86 (57.7)                                     |         |
| Certified with ABFM in February 2018               | 338 (94.9)  | 630 (83.3)                                    | < .0001 |
| Faculty (n = 1109)                                 |   |   | .59     |
| Yes  | 227 (63.8)  | 447 (59.4)                                    |         |
| No   | 129 (36.2)  | 306 (40.6)                                    |         |
| Practice size                                      |   |   | .31     |
| Solo   | 36 (10.6)   | 76 (10.1)                                     |         |
| Small  | 130 (36.5)  | 295 (39.2)                                    |         |
| Large  | 91 (25.6)   | 155 (20.6)                                    |         |
| Other  | 99 (27.8)   | 227 (30.2)                                    |         |
| Most time in sports medicine devoted to (n = 1108) |   |   | .035    |
| Administration                                     | 7 (2.0)   | 24 (3.2)                                      |         |
| Direct patient care                                | 334 (94.1)  | 667 (88.6)                                    |         |
| Research   | 1 (0.3)   | 3 (0.4)                                       |         |
| Teaching   | 13 (3.7)  | 59 (7.8)                                      |         |
| Participates in an organized sports clinic         | 317 (89.0)  | 345 (49.0)                                    | < .0001 |
| Team physician level (n = 856)                     |   |   |         |
| Adolescent   | 111 (34.1)  | 230 (43.4)                                    | .0067   |
| Child  | 18 (5.5)  | 16 (3.0)                                      | .069    |
| Collegiate   | 178 (54.6)  | 202 (38.1)                                    | < .0001 |
| International/amateur                              | 27 (8.3)  | 41 (7.7)                                      | .77     |
| Professional                                       | 57 (17.5)   | 67 (12.6)                                     | .051    |

IQR, interquartile range; ABFM, American Board of Family Medicine.

Parsimonious regression analysis (Table 3) found that age less than 47.3 years (OR, 1.53; 1.12–2.08), service as a collegiate team physician (OR, 1.66; 1.10–2.50), and recent recertification

in sports medicine (OR, 2.47; 1.62–3.78) predicted greater odds of spending 75% or more time devoted to sports medicine. Most notably, practicing in a sports medicine clinic predicted a

**Table 3. Characteristics Associated with Spending More than 75% of Professional Activities in Sports Medicine by American Board of Family Medicine Sports Medicine Certificate of Added Qualification Diplomats, 2003–2017**

| Characteristic  | Odds Ratio (95% CI) |
|---|---------------------|
| Age less than median (47.3 years)                           | 1.53 (1.12–2.08)    |
| MD  | 0.65 (0.38–1.09)    |
| Most recent exam year 2011 to 2017 compared to earlier exam | 2.47 (1.62–3.78)    |
| Faculty   |                     |
| Yes   | 0.79 (0.57–1.11)    |
| No  | REF                 |
| Participates in an organized sports clinic                  | 6.43 (4.15–9.95)    |
| Team physician level  |                     |
| Professional  | 1.48 (0.92–2.37)    |
| Adolescent  | 0.98 (0.65–1.48)    |
| Child   | 1.10 (0.46–2.66)    |
| International/amateur                                       | 0.98 (0.54–1.76)    |
| Collegiate  | 1.66 (1.10–2.50)    |

CI, confidence interval.

greater than 6-fold greater odds (OR, 6.43; 4.15–9.95) of spending 75% or more time devoted to sports medicine.

## Discussion

Our findings confirm those found in previous studies that have demonstrated that SM-FPs tend to be predominately male, under the age of 50 years, hold faculty appointments, and serve as team physicians; while they do spend most of their time in clinical practice, the majority do not spend most of their time practicing sports medicine exclusively.<sup>1,4,7–9</sup> Similarly, our results confirm recent findings that an increasing number of SM-FPs are spending more time practicing sports medicine exclusively.<sup>1,4,7</sup>

Age, collegiate team physician status, recent recertification in sports medicine, and practice in a sports medicine clinic all independently predicted a greater odds of spending 75% or more of their professional time in sports medicine, with recent recertification and practice in a sports medicine clinic having the greatest odds at almost a 2.5-fold and 6.5-fold odds, respectively. These latter findings seem to be consistent with witnessed trends in the employment status of SM-FPs over the past 15 years.<sup>4</sup>

As the number of orthopedic referrals have increased within the health care system,<sup>10</sup> the

demand for fellowship-trained and board-certified SM-FPs has risen with the shift to value-based reimbursement. This has been best demonstrated by the dramatic decrease in unneeded referrals to orthopedists in a recent study that explored the impact of an organized sports medicine clinic on referrals to the orthopedic department within a health care system over a 1-year period. Of the almost 5000 patients seen, only 2.4% were referred to orthopedics with the majority (68%) of these referrals requiring surgery. The mean wait time for an orthopedic consultation was reduced from 199 to 70 days, and the mean wait time for an appointment to the orthopedic clinic dropped from 97 to 19 days.<sup>11</sup> The recommendation by the American Medical Society for Sports Medicine (AMSSM), the specialty society with the largest number of SM-FPs in the United States, to add a standardized ultrasound curriculum into ACGME Sports Medicine Fellowships,<sup>12</sup> and the decision of the ACGME to approve these for inclusion into the program requirements for training in sports medicine<sup>13</sup> have further enhanced the diagnostic and therapeutic skills of SM-FPs, making them even more desirable in this regard.

It could be argued that the enhanced competence of SM-FPs in managing nonsurgical orthopedic problems efficiently has led to large multispecialty groups as well as private orthopedic groups hiring SM-FPs directly, with job descriptions mandating that they devote their professional time to practicing sports medicine almost exclusively. Recent evidence would seem to bear this out. We have previously reported that 43.7% of SM-FPs are working in multispecialty groups<sup>7</sup> and the AMSSM 2018 Recent Graduate and Practice Salary Survey found that 22% of recent fellowship graduates had accepted jobs in private orthopedic groups.<sup>14</sup>

This demand has resulted in highly competitive compensation packages, which have attracted SM-FPs to these positions. A 2008 study conducted to assess the scope, compensation, and satisfaction among Sports Medicine physicians found that 26% of those in the upper 25th percentile of compensation who manage a large percentage of musculoskeletal complaints earn \$180,000 or more compared with just 12% of the group in the lower 25th percentile.<sup>9</sup> Similarly, data from the American Medical Society of Sports Medicine (AMSSM) 2016 Recent Graduate and Practice Salary Survey showed that 25% to 30% of the respondents practiced in an orthopedic clinic, and the average salary for those

individuals was approximately \$20,000 to \$30,000 higher (depending on the number of years in practice) than the average salary among all respondents.<sup>8</sup> The higher salaries in these settings, where it is expected that most, if not all, of the clinicians' time is spent delivering sports medicine care exclusively, certainly have provided significant incentive for SM-FPs to pursue these positions rather than practice arrangements where the time devoted to sports medicine is in addition to delivering primary care.

It may well be that SM-FPs devoting most of their time to sports medicine are more inclined to provide this care. Despite the fact that the ACGME program requirements have essentially remained unchanged during the study period, the introduction of musculoskeletal ultrasound into the curriculum of almost all programs and the focused revision of the requirements reflecting this have increased the musculoskeletal procedural competency of recent graduates. If more time in fellowship training is spent in the skill development of musculoskeletal care and related procedures, then more SM-FPs may shun traditional primary care roles in favor of positions that allow them to take advantage of their advanced diagnostic and therapeutic skills in musculoskeletal care.

Our results also showed that intercollegiate team physicians have 66% increased odds of devoting 75% or more of their time to the practice of sports medicine. The number of National Collegiate Athletic Association (NCAA) athletes has recently reached an all-time high,<sup>15</sup> and increasing recognition of the importance of providing comprehensive care to this population by team physicians in addition to musculoskeletal care has gained acceptance.<sup>4</sup> By virtue of the broad training in their primary specialty of family medicine, SM-FPs are well suited for these positions. Given the increasing numbers of athletes participating in sports at NCAA member institutions, it would seem logical that those SM-FPs serving in this capacity would spend the great majority of time caring for these athletes.

Several limitations in this study deserve mentioning. First, data were obtained from SM-FPs taking the ABFM sports medicine recertification examination. For many of these physicians at least 10 years had transpired since initial certification and/or completion of their fellowship training, and in some instances, at least 20 years may have passed. If recently graduated SM-FPs are spending more time devoted to sports medicine as recent trends suggest, we may have

underestimated the number spending more time devoted exclusively to the practice of sports medicine. Second, much of the data are self reported, subject to recall bias, and cannot be independently verified. Third, while we have previously shown that the ABFM primary examination cohorts are generally representative from year to year,<sup>6</sup> the representativeness of the SM examination cohorts each year is unknown; however, the large sampling period used for this study should have mitigated this concern. Fourth, while we have previously shown that the scope of practice of physicians holding certification in sports medicine does not differ significantly from board certified family physicians without sports medicine certification,<sup>7</sup> we were unable to determine whether the same was true for the 2 cohorts we evaluated in this study given the limitations of our data. Finally, our sample only consisted of SM-FPs and may not be representative of the entire population of sports medicine physicians. However, given that family physicians currently comprise 62% of all board-certified sports medicine physicians,<sup>7</sup> our results are representative of the majority of board-certified sports medicine physicians.

We have shown that 32% of a large sample of family physicians certified in sports medicine collected over a 15-year period devote 75% or more of their professional time to the practice of sports medicine. These physicians were more likely to be younger, recently certified, practicing in an organized sports medicine clinic, devoting more time to direct patient care, and serving as youth or intercollegiate team physicians than their counterparts spending less than 75% of their time practicing sports medicine. Multivariate analysis demonstrated that age, recent certification, intercollegiate team physician status, and practicing in an organized sports medicine clinic were each associated with greater odds of spending 75% or more of their time devoted to the practice of sports medicine. These predictors seem consistent with recent trends in the employment and recruitment of these physicians. Further research is needed to determine whether the scope of practice of these family physicians has narrowed given the significant amount of professional time devoted exclusively to sports medicine.

To see this article online, please go to: <http://jabfm.org/content/34/1/189.full>.

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