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Original Research

## Early sport specialization in men's lacrosse: a survey of 158 professional lacrosse athletes<sup>☆</sup>

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### ABSTRACT

**Introduction:** Across all youth sports, the trend of single sport specialization continues at a concerning pace and often at an increasingly younger age.

**Objectives:** To determine the prevalence of youth single sport specialization among current professional lacrosse athletes.

**Methods:** An online survey was distributed to each athlete of a men's professional lacrosse league. Athletes were asked if they specialized to play lacrosse at the exclusion of other sports. We analyzed the rate and age of early sport specialization, reasons for specialization, and the athlete's perceptions pertaining to this topic.

**Results:** A total of 158 out of 164 athletes completed the survey, for a response rate of 96.3%. Less than one-third, (48/158 = 30.4%) of men's professional lacrosse athletes specialized to play lacrosse at the exclusion of other sports during their childhood/ adolescence. Of the athletes that did specialize, they did so at an average age of  $16.5 \pm 1.58$  years old. Only 2.5% of professional lacrosse athletes specialized prior to the age of 13, with the majority (88.6%) of athletes classifying themselves as "multi-sport" athletes during high school. 96.8% of professional lacrosse athletes would not recommend single sport specialization to their own children.

**Conclusion:** For the professional lacrosse athletes studied, single sport specialization was not necessary to achieve elite status in their sport. The majority of current professional lacrosse athletes were multi-sport athletes in high school. This study adds to the growing body of literature challenging the trend of single sport specialization among current youth athletes.

### Introduction

Early sport specialization continues to rise among American youth athletes. Furthermore, the age at which an athlete specializes to become a year-round, single sport athlete is dropping, often at an age before high school. The decreasing age of specialization before physeal closure places increased pressure and risk of injury on the developing adolescent body.<sup>1</sup> An athlete is considered overspecialized if he or she is engaged in intense, year-round ( $\geq 8$  months per year) training and competition in a single sport at the exclusion of other sports.<sup>2</sup>

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Many youth athletes, parents, and coaches who share the goal of obtaining a college scholarship or reaching elite status in their sport continue to feel pressure to focus on skill development within one sport at an increasingly young age. Anecdotes and individual examples of success through this approach seem to counterintuitively outweigh the now growing orthopedic literature and expert opinion expressing the contrary. The disconnect between the current trend towards early sport specialization and the recommendations of the sports medicine community present a challenging topic and highlight the important role of the sports medicine physician in the current societal landscape and care of the youth athlete.

In response to this growing trend of early sports specialization, there have been a number of position statements issued on the role of sports specialization in youth sports including recommendations from the American Academy of Pediatrics (AAP),<sup>3</sup> National Athletic Trainers Association (NATA),<sup>4</sup> American Orthopaedic Society for Sports Medicine (AOSSM),<sup>5</sup> and the National Federation of High Schools (NFHS).<sup>6</sup> All statements recommend the importance of sports diversification for youth athletes, appropriate rest both in-season and between seasons, involvement with one team at a time, and the importance of time away from the athlete's main sport for appropriate rest after each season. Furthermore, they highlight the increased risk of injury with early sport specialization at a young age.

Cited as one of the world's oldest sports, lacrosse is a fast paced team sport that has continued to grow in popularity over the past 2 decades among high school and youth athletes.<sup>7</sup> USA Lacrosse notes a 50% rise in the level of youth participation from 2006 to 2018 with over 275,000 boys playing youth lacrosse in the United States.<sup>7</sup> The National Federation of High School Sports has also seen a rise in boys high school lacrosse, with participation numbers increasing from 50,000 participants across the United States in 2002, to more than 113,000 in 2018.<sup>6</sup> Collegiate men's lacrosse saw a similar increase in participation from 2006 to 2018 with a 36% increase in participation and a 19% increase in the number of collegiate teams playing lacrosse from 2013 to 2018.<sup>7</sup> The rise in popularity of the sport of lacrosse also brings with it a risk of early sport specialization among youth athletes.

We hypothesize that the majority of current professional lacrosse athletes were multi-sport athletes during their childhood and did not specialize to play lacrosse before high school. The purpose of this study was to examine the topic of single sport specialization within the sport of lacrosse, which to our knowledge has not been reported on to date. We sought to determine the prevalence of youth single sport specialization in current professional lacrosse athletes, identify the age at which specialization occurred, and examine the reasons and beliefs of professional athletes surrounding this topic.

## Materials and methods

Over a two-month period in 2020, all professional lacrosse athletes in the Premier Lacrosse League (PLL) were sent an electronic survey by the head league physician. The PLL was formed in 2018, and recently merged with Major League Lacrosse, making it the sole and major outdoor men's professional lacrosse league in America. At the time of the survey, a total of seven teams comprised the PLL, with a total of 164 athletes in the league. One hundred fifty eight out of 164 athletes completed the survey, for a response rate of 96.3%. This survey has been previously administered and published in a similar professional athletic population on this topic.<sup>8</sup> Institutional review board approval and exempt status was obtained for this study. Additionally, league approval was obtained prior to study administration.

An online survey was distributed to each athlete of a men's professional lacrosse league. An online survey tool (SurveyMonkey) was utilized to collect the surveys and the athletes' responses were voluntary. Survey questions asked details pertaining to demographics, current sport involvement, history of specialization, and each player's perspective on single sport specialization. Athletes were asked if they chose to specialize to play lacrosse at the exclusion of other sports. If yes, further information was gathered pertaining to this decision.

The data collected were retrospective in nature and analyzed for statistical results. To account for a small percentage of questions left blank by an individual athlete, all percentages reported represent the number of responses divided by the total number of respondents for that individual question.

## Results

The demographic information of the professional athlete cohort is presented in [Table 1](#). The average number of years playing professional lacrosse was  $5.8 \pm 3.5$  years. Most athletes surveyed played a different sport as their first competitive sport (82.3%) and played multiple sports in their lifetime competitively (96.8%).

The results of the survey pertaining to sport specialization are presented in [Table 2](#). Of the 158 professional lacrosse athletes, less than one-third ( $48/158 = 30.4\%$ ) specialized to play lacrosse at the exclusion of other sports during their childhood or adolescence. Of the athletes that did specialize, they did so at an average age of  $16.5 \pm 1.6$  years old. Only 2.5% of athletes specialized before the age of 13 to play lacrosse at the exclusion of other sports. The majority (96.2%) of athletes played on their high school lacrosse team. A lower, but still high, percentage played on a travel or club lacrosse team (85.9%); however, the majority of athletes did not overlap seasons to play on more than one team at a time (73.2%).

[Table 3](#) presents the athletes' perspectives on single sport specialization. The majority (88.6%) of athletes classified themselves as "multi-sport" athletes during high school. When asked about their opinion of single sport specialization, 96.8% of professional lacrosse athletes would not recommend single sport specialization to their children. However, of those that did specialize, most (73.9%) were happy with the age at which they did specialize. Less than half (41.7%) of athletes who did specialize believed they would be playing professional lacrosse if they did not specialize at the age at which they did.

**Table 1**  
Demographic information of the professional lacrosse athlete cohort.

Characteristics of all players	Value
No. of responses	158
Age (y)	26.89 ± 3.41
Position	
Attack	27/158 = 17.1%
Midfield	75/158 = 47.5%
Defense	31/158 = 19.6%
Face Off	12/158 = 7.6%
Goalie	13/158 = 8.2%
No. years playing professional lacrosse	5.8 ± 3.5
Was lacrosse the first sport you played at a competitive level? (Y)	28/158 = 17.7%
Have you only played one sport competitively in your life? (Y)	5/157 = 3.2%

Values are presented as mean ± SD unless otherwise indicated. Percentages are presented based on the number of responses for each individual question.

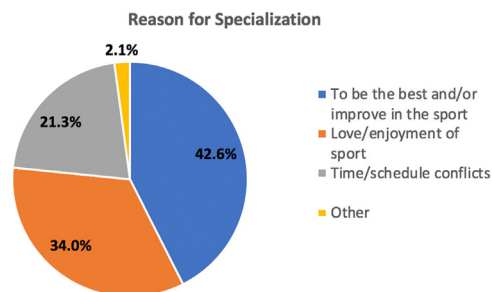
**Table 2**  
Survey results regarding sport specialization in professional lacrosse athlete cohort.

Sport specialization responses	Value
Did you specialize to play lacrosse before the age of 13? (Y)	4/157 = 2.5%
Did you quit other sports to focus on lacrosse? (Y)	48/158 = 30.4%
At what age did you quit other sports to focus on lacrosse? (years)	16.5 ± 1.6
At the time of specialization:	
How many months/year did you <i>play</i> lacrosse?	8.7 ± 2.7 mo/y
How many months/year did you <i>train</i> for lacrosse (weight training, fitness, skills)?	9.4 ± 3.7 mo/y
How many months/year did you <i>compete</i> in lacrosse games?	6.7 ± 2.1 mo/y
Did you ever sustain an injury you attributed to specialization in lacrosse? (Y)	7/48 = 14.6%
Did you compete on your high school (HS) team in lacrosse? (Y)	151/157 = 96.2%
Did you compete on a travel or club team in lacrosse? (Y)	135/157 = 85.9%
Did you compete on your HS and travel/club teams in the same season? (Y)	42/157 = 26.8%

Values are presented as mean ± SD unless otherwise indicated. Percentages are presented based on the number of responses for each individual question.

**Table 3**  
Professional lacrosse athletes’ perspectives on single sport specialization.

Single sport specialization perspectives	Value
Are you glad you specialized to play one sport at the age you did?	Yes: 34/46 = 73.9%
Do you think you would be playing lacrosse at a professional level if you did not specialize at the age you did?	Yes: 20/48 = 41.7%
During high school, would you consider yourself a multi-sport or single-sport athlete?	Multi: 140/158 = 88.6%
Will you recommend to your kids to specialize to play one sport before high school?	Yes: 5/158 = 3.2%



**Figure 1.** Pie chart showing athlete responses when asked their reason for specialization.

Reasons for specialization are presented in [Figure 1](#). The majority of respondents (76.6%) chose to specialize to improve in their sport or due to love/enjoyment of this sport.

## Discussion

The results of our study showed that for the current cohort of men's professional lacrosse athletes, early single sport specialization was not necessary to achieve elite status. To our knowledge, our study represents the largest study examining the topic of early sport specialization in professional lacrosse athletes. In our study, less than one third of professional athletes specialized to play lacrosse at the exclusion of other sports.

Our findings support our hypothesis that professional lacrosse players were multi-sport athletes and did not specialize during their childhood to focus on lacrosse at the exclusion of other sports. Furthermore, our research goes against the current perception among many youth athletes, parents, and coaches that focusing on one sport at a young age is the pathway to success at a high level in that sport. The majority of current professional lacrosse athletes were multi-sport athletes in high school. Our study also highlights that the majority of professional lacrosse athletes (73.2%) did not play for two teams in the same season.

Youth sport participation has a number of benefits such as promoting an active lifestyle, allowing the athlete to enjoy playing their sport, and improved self-image. However, sport specialization, and to be specific, *early* sport specialization has been shown to be an independent risk factor for overuse injury and can also lead to unintended psychological effects, including burnout, depression and anxiety.<sup>2,9</sup> In our study, of the athletes that did specialize, they did so at an average age of 16.5 years old, with only 2.5% of lacrosse athletes choosing to specialize before the age of 13. An average age of specialization of 16 years old contrasts with the current trend of youth athletes, who are often choosing to specialize before their high school years. This young age of specialization carries with it a higher risk of injury to the developing body before physeal closure and further emotional maturation. When combining our data on the sport of lacrosse to the remainder of the literature on this topic, the message is clear; we should continue to advocate for multi-sport participation of our youth athletes with at least 4 months of rest away from their main sport until at least the beginning of their high school years.

### *Does specialization increase college scholarships?*

An analysis of sports specialization in National Collegiate Athletic Association (NCAA) Division I athletes by Post et al found that the majority were not classified as highly specialized throughout high school, with 16.9% of surveyed athletes classified as specialized in 9th grade and 41% by 12th grade.<sup>10</sup> Another study of Division 1 athletes published by Swindell et al<sup>11</sup> found that 94.7% of specialized athletes previously played other sports prior to college. Forty-five percent of respondents played multiple sports until the age of 16. Members of team sports specialized at a later age vs individual sports (15.5 vs 14). The conclusion of the study noted that early sports specialization is uncommon at NCAA Division I for most team sports participants. Consequently, it can be assumed that early specialization is not necessary for a college scholarship.<sup>12,13</sup> There are other factors besides sports specialization, such as injuries, speed, physical stature, mental toughness and intelligence which impact participation on the collegiate or elite levels.<sup>14-16</sup>

### *What motivates early sport specialization?*

It is also important to examine the motivating reasons to specialize in 1 sport year-round at a young age. There is a commonly held belief that early specialization will increase the likelihood of attaining a college scholarship and achieving elite level status in their sport.<sup>8,17</sup> However, the data tells a different story. Based on the NFHS participation numbers, 12.8% of high-school lacrosse athletes will play at a collegiate level, with 3.1% participating at a Division 1 level.<sup>18</sup> Furthermore, although the NCAA did not calculate the rate of "going pro" in the sport of lacrosse, one would expect a similarly low percentage to the published rates of other sports such as basketball (1.2%), football (1.6%), ice hockey (7.4%) and baseball (9.9%).<sup>18</sup> In contrast, Padaki et al<sup>19</sup> studied 201 parents in the New York area and found that half of all surveyed parents expected their child to play college or professional sports. Parental influence is particularly strong among younger athletes<sup>10,19</sup> and additionally coaches are also often involved in influencing intensive training and specialization.<sup>20</sup> This discrepancy between perception and reality will likely continue to drive early sport specialization trends in youth athletics for years to come.

### *Limitations*

There are several limitations to this study that are important to highlight. First, this survey was done retrospectively, so exact memory of sport specialization timing and rationale may be subject to recall bias by the athlete as this was not a prospective study of this topic. Second, our study did not have any medical confirmation of injury data so any extrapolation of an athlete's perception of injury during their adolescence must be interpreted with this information in mind. Third, understanding the path to elite level success of today's professional athletes can aid in counseling current youth athletes. However, it is important not to over-extrapolate this data to current youth athletes, as the landscape facing today's youth athlete is very different than at the time many of the current athletes were at the same phase of their development. We do not know if this would have affected the current professional athletes' decisions on specialization. Finally, this study was performed on men's professional lacrosse athletes and it is unknown if this data can be extrapolated to women's lacrosse athletes.

## Conclusion

For the current professional lacrosse athletes, early sport specialization was not necessary to achieve elite level success. The majority of professional lacrosse athletes did not specialize before high school and were multi-sport athletes. This study adds to the growing body of literature challenging the trend of single sport specialization among current youth athletes. Sports medicine providers need to continue to educate athletes, parents, coaches, and other physicians that early sport specialization is not necessary for sport success and advancement, but rather has been identified as an independent risk factor for injuries.

## Authorship contribution

T.S.W. - Manuscript preparation, editing, and submission.

E.N. - Survey administration, manuscript preparation and editing.

P.S.B. - Survey administration, manuscript preparation and editing, final analysis of manuscript.

C.A.L. - Survey administration, manuscript preparation and editing, final analysis of manuscript.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Patrick Buckley reports a relationship with Smith and Nephew Inc that includes a consulting relationship and reimbursement for educational activities.

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