Trends in the Orthopedic Job Market and the Importance of Fellowship Subspecialty Training

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abstract

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Previous studies have examined possible incentives for pursuing orthopedic fellowship training, but we are unaware of previously published studies reporting the trends in the orthopedic job market since the acceptance of certain criteria for fellowship programs by the Accreditation Council for Graduate Medical Education (ACGME) in 1985. We hypothesized that, since the initiation of accredited postresidency fellowship programs, job opportunities for fellowship-trained orthopedic surgeons have increased and job opportunities for nonfellowship-trained orthopedic surgeons have decreased. We reviewed the job advertisements printed in the Journal of Bone and Joint Surgery, American Volume, for the years 1984, 1994, 2004, and 2009. We categorized the job opportunities as available for either a general (nonfellowship-trained) orthopedic surgeon or a fellowship-trained orthopedic surgeon. Based on the advertisements posted in the Journal of Bone and Joint Surgery, American Volume, a trend exists in the orthopedic job market toward seeking fellowship-trained orthopedic surgeons. In the years 1984, 1994, 2004, and 2009, the percentage of job opportunities seeking fellowship-trained orthopedic surgeons was 16.7% (95% confidence interval [CI], 13.1%-20.3%), 40.6% (95% CI, 38.1%-43.1%), 52.2% (95% CI, 48.5%-55.9%), and 68.2% (95% CI, 65.0%-71.4%), respectively. These differences were statistically significant (analysis of variance, P<.05). Fellowship training is thus a worthwhile endeavor.

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It is well recognized that, like other specialties, orthopedic surgery has become more subspecialized over the past few decades. Between 1990 and 2006, the proportion of practicing orthopedic generalists decreased from 44.2% to 28.7%. Despite previous public policies to support orthopedic generalists, the popularity of orthopedic fellowships has increased. Although in 1997 approximately two-thirds of orthopedic residents went on to fellowship, it is now estimated that at least 90% of graduating orthopedic surgery residents take at least 1 additional year for accredited or unaccredited fellowships.

Many reasons exist for this increase. A 1998 symposium sponsored by the American Orthopaedic Association (AOA), the Academic Orthopaedic Society, and the Council on Musculoskeletal Specialties, citing surveys by the American Academy of Orthopaedic Surgeons (AAOS), recognized 4 major reasons why residents sought advanced fellowships: some applicants desire extra training in a specific area of interest (to potentially evolve their practice into more of a subspecialty); some believe that they need to have another year’s experience to gain confidence and maturity; some desire to be more attractive candidates for job opportunities; and some express the concern of having inadequate residency training in certain areas that they will need in practice situations. However, Sarmiento reported that many residents are not seeking fellowships in areas of perceived deficiency but rather in areas where greater opportunities for lucrative practices exist.

Economic reasons exist to pursue fellowship training. In 2009, Gaskill et al stated that “the growing educational debt, and the perceived expected ability to repay it, may increasingly influence the decision to pursue fellowship training in lieu of general orthopedic practice.” However, their study showed that the lifetime net present value of a fellowship-trained subspecialist was not always greater than that of a general orthopedic surgeon. From a financial perspective, fellowship training and subspecialization in pediatrics, trauma, foot/ankle, and arthroplasty could be viewed as a poor financial decision because the lifetime net present value remained less than that of a generalist. Thus, the fact that orthopedic residents are increasingly seeking fellowship training cannot solely be attributed to financial reasons.

Although the number of orthopedic residents pursuing post-residency fellowships has increased, a demand exists for fellowship-trained orthopedists. The Association of American Medical Colleges (AAMC) recently called for an expansion of medical schools to meet the increasing demand for physicians. This demand is due in part to general preferences for more specialized services and is not necessarily evidence based, economically sensitive, or synonymous with patient need. In 2008, Salsberg et al quoted a survey from an AOA meeting that reported that an oversupply of orthopedic surgeons exists in some subspecialties and an undersupply exists in others. Participants in the survey felt that sports medicine was the most oversupplied subspecialty and that pediatrics, trauma, and oncology were the most undersupplied. The question then is whether physician rationing is needed to cover these perceived deficits. Do current job opportunities reflect the asymmetric distribution of orthopedic subspecialists? Can the job market help explain why so many orthopedic residents prolong their training for at least 1 additional year of fellowship training?

Our hypothesis was that available job opportunities play a major role in a resident’s decision to pursue fellowship training. Using published advertisements in the Journal of Bone and Joint Surgery, American Volume (JBJS-A), as a measure of the entire job market, we hypothesized that since the initiation of orthopedic fellowship training programs in 1985, job opportunities for fellowship-trained orthopedic surgeons in the United States have increased, and job opportunities for nonfellowship-trained orthopedic surgeons have decreased.

**Materials and Methods**

Advertisements published in JBJS-A in 1984, 1994, 2004, and 2009 were reviewed. The material was obtained from the printed journal or via the electronic version of JBJS-A as back matter. A coding system was created to ensure consistency in the categorization of job opportunities. All advertisements were reviewed by a single author (N.T.M.). Advertisements were coded as fellowship or general (Table). If an advertisement was coded as fellowship, the specific type of fellowship was separately noted. The following advertisements were not included in this study: administrative positions (eg, chair or chief), research-only positions, international positions (including Canada), practices for sale, and advertisements by recruiting agencies.

**Table**

<table>
<thead>
<tr>
<th>General Orthopedics</th>
<th>Fellowship</th>
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<tbody>
<tr>
<td>Seeking surgeon to practice general orthopedics</td>
<td>Seeking specific fellowship-trained surgeon</td>
</tr>
<tr>
<td>Fellowship training “not required,” “desired,” or “preferred”</td>
<td>Fellowship training “required” or “essential”</td>
</tr>
<tr>
<td>Academic/faculty positions mentioning “general orthopedics” without mention of fellowship training</td>
<td>Academic/faculty positions seeking subspecialized surgeons (eg, hand, sports medicine), even if fellowship training is not specified</td>
</tr>
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</table>
or locum tenens. In addition, nebulous advertisements that said fellowship training was required but did not mention the subspecialty sought or the subspecialty of the advertising practice were not counted.

An advertisement was coded as general if it sought a surgeon to practice general orthopedics or if it mentioned fellowship training but said it was “not required” or “desired/preferred.” An advertisement was coded as fellowship if such training was required or essential. An advertisement was coded as fellowship if it sought a specific fellowship-trained surgeon or a specific subspecialty (eg, hand, sports) without mentioning fellowship training. Academic or faculty positions that did not mention fellowship training but mentioned specific subspecialties were coded as fellowship. Such academic advertisements that specifically mentioned general orthopedics without mention of fellowship training were coded as general. If an advertisement mentioned multiple position types, each was counted separately (eg, if an advertisement sought surgeons in general orthopedics, sports, spine, and foot/ankle, the advertisement was coded as 4 advertisements: 3 fellowship and 1 general). If fellowship training was required but multiple areas or subspecialties were offered, each subspecialty mentioned was coded as a separate fellowship advertisement. If the number of positions was not specified but a particular location or job site was clear, the advertisement was coded as 1 advertisement.

Nine fellowships were considered in this study: hand/upper extremity/micro; shoulder/elbow; joints/adult reconstruction; sports medicine; spine; foot/ankle; pediatrics; trauma; and musculoskeletal oncology. Podiatry and rehabilitation advertisements were excluded. The data were grouped as fellowship or general. The results from each journal edition were considered as data points in that respective year’s series. Data were presented as a percentage of the total number of job advertisements (±95% confidence interval). The statistical significance of the differences found were compared using analysis of variance (ANOVA) with α = 0.05.

RESULTS

The average number of printed advertisements in JBJS-A increased steadily between 1984 and 2004 and decreased in 2009. Of the advertisements meeting our criteria, an average of 56 total advertisements appeared per edition in 1984, an average of 124 total advertisements appeared per edition in 1994, an average of 202 total advertisements appeared per edition in 2004, and an average of 88 total advertisements appeared per edition in 2009 (Figure 1A). Of the years evaluated in this study, only the advertisements in 2009 were organized by subspecialty area in the printed journal, perhaps indicating that subspecialization had, at least to some degree, become a priority for job advertisements. The advertisements in 1984, 1994, and 2004 appeared randomly oriented, making the process of finding a position more cumbersome. No obvious pattern existed as to how many advertisements were excluded in each edition; sometimes a few were excluded, and other times many were excluded. Recruiting agencies represented the most commonly excluded advertisements because the number of positions and position details were not clear.

In 1984, the percentage of general orthopedic job opportunities was 83.3% (95% confidence interval [CI], 79.7%-86.9%) compared with 16.7% (95% CI, 13.1%-20.3%) for fellowship-trained orthopedic job opportunities. In 1994, the percentage of job opportunities seeking fellowship-trained orthopedic surgeons was 40.6% (95% CI, 38.1%-43.1%); in 2004, it was 52.2% (95% CI, 48.5%-55.9%); and in 2009, it was 68.2% (95% CI, 65.0%-71.4%). By ANOVA, this trend was statistically significant, with all differences having a P value <.05 (Figure 1B).

When separated into each respective fellowship area, the percentage of job offerings seeking that specific area of fellowship training has increased in most subspecialties, some despite previous notions of satu-
rated markets (e.g., sports medicine). When comparing 2009 with 1984, a statistically significant increase in the percentage of jobs seeking such training occurred in all areas except shoulder/elbow and pediatrics (ANOVA, \( P < .05 \)). When comparing 2009 with 1994, statistically significant changes occurred in all areas except shoulder/elbow and oncology (ANOVA, \( P < .05 \)), although a significant decrease occurred in spine in that interval (Figure 2).

**Discussion**

Although studies have examined possible incentives for pursuing orthopedic fellowship training, we are aware of no previously published report that addresses the trends in the orthopedic job market since the implementation of ACGME-accredited fellowship programs in 1985. Having searched all published advertisements in JBJS-A in 1984, 1994, 2004, and 2009, we conclude a statistically significant increase has occurred in the demand for fellowship training in job openings, and conversely a significant decrease in opportunities for orthopedic generalists (nonfellowship-trained orthopedists). This is consistent with previous reports demonstrating the decrease in practicing orthopedic generalists.\(^1\) Although an orthopedic resident may seek fellowship training for many reasons—including intellectual stimulation in an area of particular interest, gaining confidence/maturity, filling voids in inadequate training, prestige, lifestyle, and financial incentives—simply having more job options on graduation may be an understated reason. Thus, our study may shed significant light on a major reason behind the increase in orthopedic residents seeking fellowship training.\(^2,3\)

In 2003, Sarmiento\(^5\) reported that there was “no evidence that additional training is needed for all physicians following the completion of residency.” Our study presents evidence that for many jobs, and even a majority of jobs, fellowship training is required or essential. Although fellowships are a worthwhile endeavor, the subspecialization of orthopedics must be structured and properly managed. Almost since the beginning of accredited fellowships, some have expressed concern about the fragmentation of the orthopedic specialty.\(^2\) Sarmiento\(^5\) reported, “Splitting orthopedics into a larger and larger number of subspecialties trivializes the profession and is not conducive to progress. We should emphasize the value of general orthopedics, without ignoring the important place and role that subspecialty medicine plays in the education of the practitioners of the art. Subspecialization must be structured and practiced in a realistic manner.” That is what the ACGME hoped to do in accrediting fellowships. Currently, hundreds of orthopedic fellowships are available, some accredited, some not, some associated with residency programs at academic centers, some affiliated with private practitioners, and some sponsored exclusively by industry. A noticeable increase exists in the number (and percentage) of advertisements for fellowships (not just jobs) from 1984 to 1994 and 2009 (data not shown), possibly indicating that too many fellowships exist.

Nevertheless, because an increasing number of jobs are requiring fellowship training, seeking fellowship training is a worthwhile endeavor. Many reasons exist for seeking fellowship training, but we realize, as did Sarmiento and Schiffman,\(^6\) that the idea of forming an exclusive subspecialty practice is not as realistic as it once was. Some of the advertisements published in later years made comments such as, “seeking general orthopedist, even if fellowship trained.” We considered these ads as general, but it is important to recognize that subspecialty training does not necessarily mean subspecialty practice. As the market becomes more saturated with subspecialists, a gradual return may occur to a system in which orthopedists, regardless of their identification with specific subspecialties, behave more as general orthopedists treating most conditions of the musculoskeletal system.\(^4\) As such, fellowships may represent an additional year of residency training, essentially a requirement for entering orthopedic practice.

A recognized limitation of this study is our overall assumption that advertisements in JBJS-A are a realistic representation of the orthopedic job market. Not all jobs are advertised in JBJS-A; many other journals, including numerous subspecialty journals, include advertisements, and many jobs may never be advertised at all, except by word of mouth. In addition, not all surgeons seeking employment turn to advertising; many create their own jobs and many turn to recruiting firms. No perfect way exists to assess something as complicated as the orthopedic job market, but because JBJS-A has been in existence longer than most other portals, it serves as a reasonable model over the past few decades.

If we assume that the advertisements in subspecialty journals cater to the readers of those journals (likely subspecialists), it is likely that even more advertisements in subspecialty journals would require fellowship training. For example, job advertisements in the *Journal of Hand Surgery* presumably seek hand fellowship-trained surgeons, whereas advertisements in *Spine* likely seek spine fellowship-trained surgeons. Perhaps our data underestimate the trend toward seeking fellowship-trained surgeons. With so many subspecialty journals to choose from, JBJS-A is likely the most read general orthopedic journal, and of all the printed journals, the one most likely to cater to and seek general orthopedists.

The question also exists about the effect of online portals. The average number of printed advertisements in JBJS-A increased steadily from 1984 to 2004, but then decreased by 2009. Rather than representing a decrease in job opportunities or a loss in popularity of the JBJS-A, this is likely due to the development of jbjjobs.org in May 2003, as well as other online orthopedic resources. Other ways to explore the orthopedic job market exist, and it remains unclear if other portals to the orthopedic job market would yield the same results. Nevertheless, even with its limitations, the advertise-
Figure 2: Percentage (± 95% confidence interval [CI]) of Journal of Bone and Joint Surgery, American Volume advertisements requiring specific subspecialty fellowship training in 1984, 1994, 2004, and 2009. Hand/upper extremity/micro (A), Shoulder/elbow (B), Joints/adult reconstruction (C), Sports medicine (D), Spine (E), Foot/ankle (F), Pediatrics (G), Trauma (H), Musculoskeletal oncology (I).
ments in JBJS-A provide a reasonable look at the state of the orthopedic job market over time, and our data represent the first to show that fellowship training has become more essential than in the past and may be an understated reason for the pursuance of postresidency training.

**Conclusion**

Since the implementation of ACGME fellowship programs in 1985, job opportunities for general orthopedic surgeons have significantly decreased, as represented through advertising in JBJS-A. Fellowship training is thus a worthwhile endeavor.

**References**


