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THE ORTHOPAEDIC FORUM



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AOA Symposium

Current State of Fellowship Hiring: Is a Universal Match Necessary? Is It Possible?*

By Christopher D. Harner, MD, Anil S. Ranawat, MD, Muriel Niederle, PhD, Alvin E. Roth, PhD, Peter J. Stern, MD, Shepard R. Hurwitz, MD, William N. Levine, MD, G. Paul DeRosa, MD, and Serena S. Hu, MD

Currently, approximately 90% of the 620 graduating orthopaedic residents in the United States are planning on entering a postgraduate fellowship. Since January 2005, two of the largest fellowship match programs, sports medicine and spine

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surgery, were dissolved by the National Resident Matching Program (NRMP) because of a gradual decline in participation, leaving approximately 70% of applicants in a nonmatching, decentralized system. This leaves hand, shoulder and elbow surgery, and foot and ankle as the only three orthopaedic subspecialties that remain in some type of match program, creating an extremely complicated hiring environment for all resi-

dents. This paper focuses on the current state of fellowship employment and hiring in orthopaedic surgery in the United States, on the likely effects of reinstating a match, and on how this might be accomplished. For this purpose, we present the results of surveys of fellowship directors and residents that we conducted and we describe how the present market for orthopaedic surgery fellows resembles the market for medical

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residents prior to the introduction of the NRMP^{1,2} and how another fellowship market has successfully reinstated a match after experiencing a comparable failure³.

We found that, in contrast to orthopaedic surgery fellowship programs that use a match, programs in subspecialties presently not participating in a match suffer from problems often seen in decentralized labor markets. Interviews and offers come earlier each year and are extended over a longer period of time. (In the economics literature, this is termed *unraveling*.) Employers or fellowship programs then make offers at different times, so that both sides face a thin market, in which only a subset of fellowships and candidates can be considered when decisions have to be made. Ultimately, programs and applicants have to make decisions with very little information about their alternatives.

To place the current situation facing orthopaedic surgery fellowships in historic context, we briefly summarize how the NRMP arose to resolve similar difficulties in the market for residents. We then document the current situation by presenting the data of two online surveys administered by the American Orthopaedic Association (AOA): one went to fellowship directors and one went to residents participating in the AOA Resident Leadership Forum. Both surveys reflect many of the problems of the current decentralized process and how they impact residents and fellowship directors. We also present the unique experiences of the three remaining subspecialties that currently still use a match: hand, foot and ankle, and shoulder and elbow surgery. Finally, we explore the available options to improve the current process using the recent experience of the reinstatement of the gastroenterology match as a potential model.

The NRMP and the History of the Market for Medical Interns

The problems facing the current hiring market for orthopaedic surgery fellows are hardly unique. They were antici-

pated by the problems in the market for residents that led to the creation of the NRMP¹⁻⁴.

In the early 1900s, the competition among hospitals for interns (and among interns for good internships) led to internship appointments being made earlier and earlier in a student's medical school career. By the 1940s, appointments were sometimes made two years ahead of medical school graduation so hospitals had little information about the student's performance, and students frequently had to accept or reject an offer without knowing what other offers might be forthcoming. This kind of market unraveling, in which appointments are offered earlier and more diffused over time, is found in other professional entry-level labor markets also⁴. From 1945 through 1951, efforts were made to make appointments at a uniform date, later in the students' medical school careers. But students came to be faced with offers having very short deadlines, again compelling many to accept offers without knowing what other offers might be forthcoming. This forced hospitals to scramble for available students since, if an initial offer was rejected, it was often too late to contact the next most preferred candidates before they had accepted another offer. The establishment of a centralized clearinghouse, along the lines of what became the resident match, was proposed as a way of alleviating this chaos and congestion and allowing the preferences of both hospitals and students to play a larger role in determining a match. In 1952, the first resident match was conducted. After interviews, students and hospitals submitted rank order lists of preferences to the matching program. An algorithm used these submitted preferences to propose a match of applicants to residency programs. Similar experiences led to the creation of matches in medical markets in the United Kingdom and Canada^{5,6}. By the 1980s and 1990s, most fellowship programs had also adopted matches²⁻⁴.

The NRMP algorithm ensures that the resulting match is stable. That is, it never produces an outcome in

which a program and applicant mutually ranked each other higher than their present match assignment, meaning that they prefer each other to their current match assignment. The stability of the matching turns out to be an important ingredient of a successful match^{1,2,5-8}. In the mid-1990s, the NRMP commissioned one of us (A.E.R.) to redesign the matching algorithm⁹. In 2007, over 27,000 individuals, including 15,000 graduating U.S. medical students, participated in the resident matching program as part of the "main match."

The NRMP currently organizes matches for thirty-three fellowship subspecialties with approximately 3500 positions. The NRMP requirements for fellowship programs to participate in a match include (1) verification that a minimum of 75% of the available subspecialty programs and positions will be registered for the match and will participate by submitting a rank order list, (2) accreditation by the American Board of Medical Specialties (ABMS), (3) an affiliation with an Accreditation Council for Graduate Medical Education (ACGME) residency program or one faculty member of the program who is affiliated with such a program, or (4) ACGME accreditation¹⁰.

Both programs and applicants participating in the match agree to abide by the results. Since 2004, forty-eight applicants and eight programs have been investigated and found to be in violation of the Match Participation Agreement. Penalties invoked include labeling applicants and programs as violators in the NRMP system, which may ban them from present and future matches¹⁰.

Fellowship Director and Resident Surveys and the AOA Symposium

To study the current state of fellowship employment in orthopaedic surgery, a survey of fellowship directors and residents was administered online by means of e-mail notification with a link to the survey on a Harvard Business School server. The fellowship director survey was e-mailed to all 438 fellow-

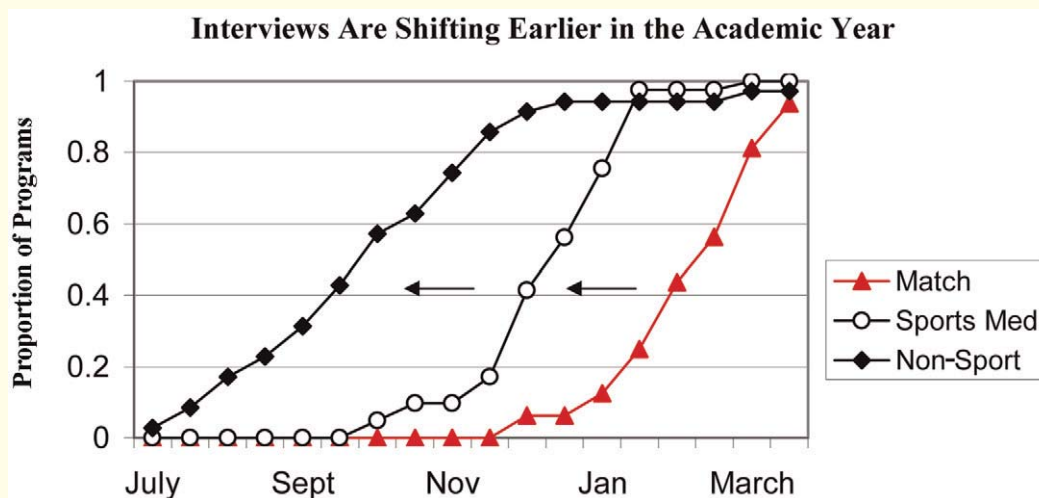


Fig. 1

The cumulative distribution of the proportion of programs by subspecialty relative to the time when they start interviewing for any given two-week period. The arrows indicate the shifting timing of the interviews. Match = interview dates of sixteen orthopaedic surgery subspecialty programs that participate in a match, Sports Med = interview dates of forty-one sports medicine programs, and Non-sport = interview dates of thirty-five orthopaedic surgery subspecialty programs that do not participate in a match and are not sports medicine programs.

ship directors (including both those in ACGME-accredited and nonaccredited programs) who were listed in the American Academy of Orthopaedic Surgeons (AAOS) Fellowship Handbook for 2007, while the resident survey was e-mailed to 112 orthopaedic residents during postgraduate year (PGY)-4 prior to their participation in the AOA Resident Leadership Forum of 2007. We first describe the fellowship director survey, which contained more details about the hiring process, and then discuss the views of residents.

Fellowship Directors' Perspectives

The fellowship director survey consisted of fifty-four questions concerning the interview process and, for the programs not participating in the Combined Musculoskeletal Matching Program (CMMP)—the orthopaedic fellowship match of the NRMP—the offer process. To study the effect of a match on the timing of interviews and the offer process, we analyze the responses of program directors depending on whether their subspecialty participated in the CMMP (hand surgery and foot and ankle) and those that do not (all others). At times, we analyze sports medicine separately, as they lost the

match only recently and are a large enough subspecialty to provide sufficient data for statistical analysis.

Of approximately 438 fellowship directors, 124 (28%) answered the survey. The directors who responded represented fifty-four programs in orthopaedic sports medicine, seventeen in orthopaedic surgery of the spine, fifteen in adult reconstructive orthopaedics, fifteen in hand surgery and shoulder and elbow surgery, nine in orthopaedic trauma, nine in pediatric orthopaedics, three in foot and ankle orthopaedics, and two in musculoskeletal oncology.

We first describe the time frame when fellowship programs start interviewing applicants, when they start making offers, and how many programs make offers at the same time. This provides evidence on the “thickness” of the market, namely, how many programs are making offers at the same time, which determines whether residents have to decide on offers before knowing which other options are available to them. Similarly, the thickness of the market determines whether some fellowship directors miss out on potential candidates because those candidates have already accepted positions before

these programs have even started interviewing.

Timing of Interviews Shifts Earlier

Fellowship directors were asked to indicate the time that they had conducted their first interviews for the fellowship class of 2008. Of the ninety-two fellowship directors who answered, sixteen were in subspecialties that use a match (thirteen programs in hand surgery and three in foot and ankle) and seventy-six were in subspecialties that do not match (forty-one were in sports medicine; six, in pediatric orthopaedics; five, in orthopaedic trauma; eleven, in spine; two, in musculoskeletal oncology; and eleven, in adult reconstruction orthopaedics). Figure 1 shows, for any two-week period, the proportion of programs that had conducted their first interview in that two-week period or earlier. The programs whose subspecialty does not use a match clearly interview earlier than do those that participate in a match. For example, in January, approximately 95% of the programs in nonparticipating subspecialties other than sports medicine had started interviewing compared with 75% of sports medicine programs and only about 10% of specialties partici-

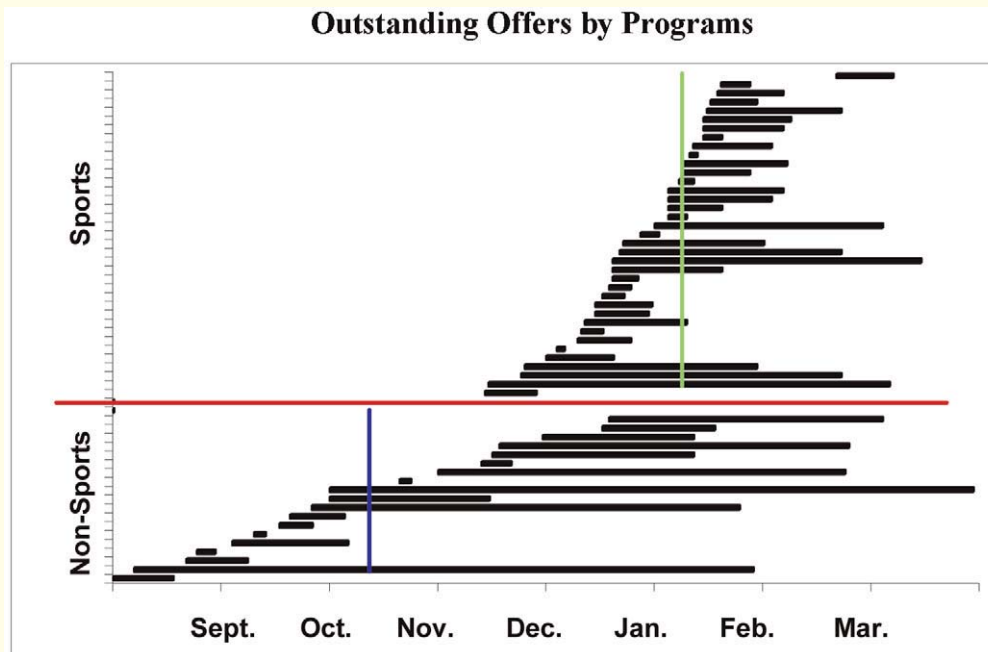


Fig. 2

The dates of outstanding offers made by thirty-seven programs in sports medicine and nineteen programs in other specialties. Each program is represented by a horizontal line, indicating the length of time during which it had outstanding offers.

pating in a match. Only by February had 40% of programs in subspecialties with a match begun interviewing, whereas programs without a match, such as sports medicine, reached the 40% level two to four months earlier (Fig. 1). Mann-Whitney tests confirm that these differences in timing are significant ($p < 0.01$ for both). The average start date of interviews for programs in a match is February 10, compared with December 16, about two months earlier, for sports medicine and October 7 for other specialties that do not participate in a match.

Experience from other specialties that have had a failed match (gastroenterology) suggests that this discrepancy in the timing may widen as specialties that do not use a match often interview earlier and earlier each year. We therefore asked fellowship directors if they adjusted the application or interview dates on the basis of the qualifications of the accepted fellows or the ease of filling fellowship positions from the previous year. Of all eighty-six program directors from subspecialties without a match process who answered this question,

thirty (35%) answered that they did. Of those thirty directors, 73% explicitly said they moved the interview date earlier. That is, at least 26% of all programs without a match process adjusted their interview dates. A few quotes from program directors in both sports medicine and other subspecialties without a match process show the dilemma they face: "We interviewed as early as possible to avoid good candidates from taking jobs before coming to our program." "We seem to have entered an arms race." "I have moved up the application process, interviews and acceptances by two months to keep pace with the competition." On the other hand, only one of the eleven programs in hand surgery and foot and ankle indicated that they had adjusted their interview dates, and that was a foot and ankle program that moved its interviewing dates later, from September to December, because of the match.

Timing of Offers

In a match, interviews are not directly linked to offers, as all offers are cen-

tralized. However, in the decentralized market for fellows, early interviews lead to early offers and hiring. Fifty-six programs (thirty-seven sports medicine and nineteen other programs) in specialties not in the CMMP provided data on the timing of their first and last offers and the length of time an offer was left open. Subspecialties other than sports medicine that do not use a match make their first offers significantly earlier than sports medicine (Mann-Whitney test, $p < 0.01$). This may be related to the fact that sports medicine programs have made an effort to delay early interviews by means of a "gentlemen's agreement" or that sports medicine only recently lost the match and is still moving earlier and earlier from year to year. To study whether offers are not only early but also dispersed, we show in Figure 2 the time when the first offer was made and the last offer expired for each program. (To be conservative, we assumed that the last offer made was also the one with the longest deadline.) This provides an upper bound for the time at which a program was actively hiring fellows. It is

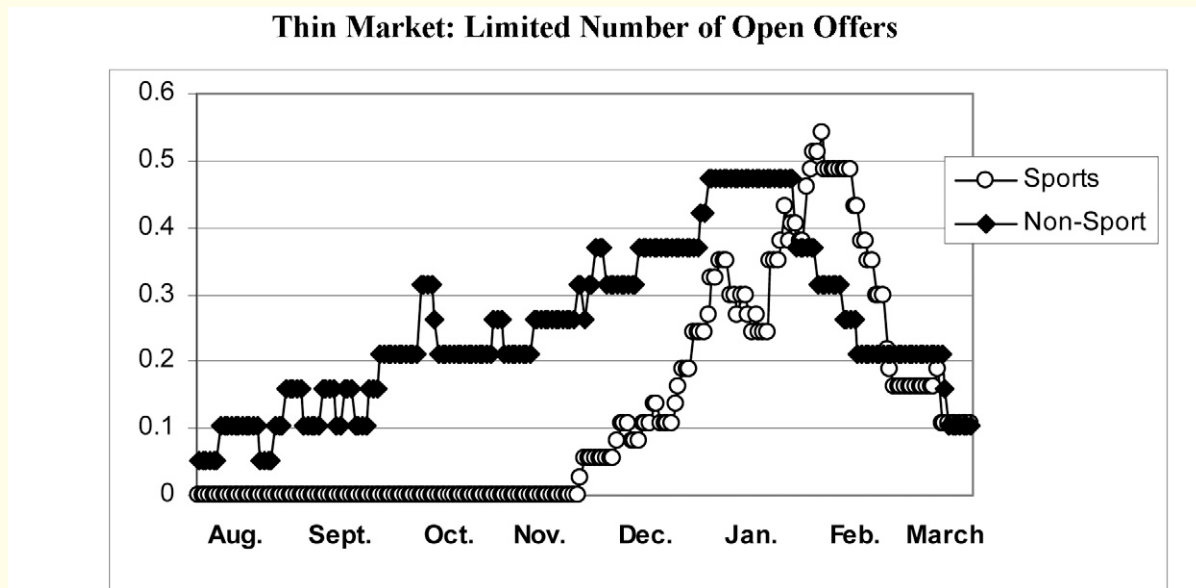


Fig. 3

For each day, the proportion of programs that have outstanding offers at any given time for both sports medicine and for all other specialties is depicted.

clear that the market without a match is thin, with only a fraction of the programs hiring at the same time. For example, of the thirty-seven sports medicine programs, 30% (eleven) of the programs had finished with making offers by January 7 (the right vertical line in Figure 2), 35% (thirteen) had not yet started, and 35% had outstanding offers. Note from Figure 1 that 24% of all programs (mostly those that participated in a match) had not even started interviewing by that date. On the other hand, nineteen programs in subspecialties other than sports medicine had a similar date three months earlier. By October 7 (the left vertical line in Figure 2), seven of the nineteen programs had no remaining outstanding offers, eight had not yet started (and about the same fraction had not even started interviewing), and only four had outstanding offers. Many applicants are confronted by an early offer that is only open for a short time (an “exploding offer”). An applicant often must accept or reject such an offer before other offers can be considered, and they may have to reply before other programs even conduct interviews. The market is thin—at no point are even 55% of the

programs making offers at the same time (Fig. 3).

Market Pressure: Cancelled Interviews and Hurried Offers

The fact that many programs finish hiring before others start, or even begin interviewing, results in planned interviews being cancelled as applicants accept early offers with short deadlines elsewhere. Of all eighty-seven programs in specialties that do not participate in the match, only 9% (eight) never had an interview canceled. A total of 41% had five or more interviews canceled, 10% had ten or more cancellations, and the average number of cancellations was about four.

A regression of the number of canceled interviews on the number of fellows sought by the fellowship program (102), whether the specialty participated in a match, and a constant yielded a match coefficient of -2.85 ($p < 0.01$), a coefficient of 0.50 ($p < 0.01$) on the number of fellows sought, and a constant of 2.93 ($p < 0.01$). That is, by controlling for the number of positions to be filled (programs that seek more candidates have more cancellations), we found that programs in specialties that

use a match incur an average of almost three fewer cancellations than other programs.

One can imagine that candidates who are faced with an offer with a deadline that would make them cancel an interview from a preferred fellowship program would first ask that program if they could speed up their interviews. Indeed, many program directors (40%; thirty-four of eighty-six) were pressed by candidates to speed up their interview process. Of those thirty-four program directors, 62% (twenty-one) indicated that they did so. Thirty-two percent (twenty-eight) of eighty-eight program directors made offers before they had finished interviewing (this was somewhat less common for the forty-four sports medicine programs as 18% [eight] reported that they had done so). Five percent (four, all of which were in sports medicine) of eighty-two programs did not have any open positions by the time of their last interview. Most (74%; twenty) of the twenty-seven fellowship directors who had made offers before they had finished interviewing indicated they did this solely because of market pressure, e.g., “If [we] don’t offer [the] spot early, [the] candidate

will be pressured to accept [a] spot elsewhere,” and “Because we had so many candidates canceling due to already accepting other offers.” Up to 30% (twenty-five) of eighty-four fellowship directors made an offer or adjusted the timing of an offer on the basis of a competing interview or an offer deadline from another program. When making offers, 48% (forty-one) of the eighty-five program directors (including 59% (twenty-six) of the forty-four sports medicine directors), took into account how likely it was for a fellow to accept an offer before extending an offer. A number of programs (23% [nineteen] of eighty-four programs including 23% [ten] of forty-three sports medicine programs) at some point had more outstanding offers than positions, although none reported that they had rescinded an offer. Several programs (12%; nine of seventy-seven) reported that some applicants had reneged on their acceptances.

Overall, the market is not thick (i.e., there are few available positions at any point in time). Program directors cannot safely act solely according to how much they like each applicant; rather, they have to take market pressures into account as well.

When asked whether they would prefer to join a match if most programs adhered to it, 66% (fifty-six) of eighty-five fellowship directors (including 71% [thirty] of forty-two sports medicine programs) indicated that they would. The common objections are that all programs need to adhere to it and that it will be hard to enforce compliance. Thus, the issue of how to prevent early agreements is paramount when the decision is being made about whether, and how, to restart the match.

Residents' Perspective

The resident survey consisted of twenty-seven online questions about the current status of fellowship employment and hiring for residents both in and outside a match process. Participants in the AOA Resident Leadership Forum were invited to participate in the survey. The AOA invited each of the 161

accredited orthopaedic residency programs in the United States to select one PGY-4 resident to discuss relevant resident issues, and the issue for 2007 was fellowship hiring and employment. One hundred and twelve residents agreed to attend the forum in 2007. Of these 112 residents, sixty-five (58%) had fully completed the twenty-seven-question online survey prior to participating in the forum.

The Resident Leadership Forum participants expressed subspecialty interest in the following proportions: 8% indicated an interest in shoulder and elbow surgery; 15%, in hand surgery; 9%, in foot and ankle; 27%, in sports medicine; 9%, in spine surgery; 5%, in arthroplasty; 6%, in pediatric orthopaedics; 6%, in orthopaedic trauma; 6%, in musculoskeletal oncology; and 9%, in none. This distribution is similar to that of the 2005 forum¹¹. Over 90% had applied for a fellowship, with >59% of them applying in a nonmatch or decentralized system. These residents applied to a mean of ten programs (range, one to twenty-five programs). Applications, including those from applicants to programs that had a match system and those that did not, were due from May through February, while interviews were held from July 1 through April 30. Considering the timing of interviews, about 22% (fourteen) of the sixty-five residents felt that they did not have enough time and exposure in their residency to decide which subspecialty to enter. In terms of offers received, 68% (twenty-eight) of forty-one residents had a deadline of a week or less and 27% (eleven) of forty-one had a day or less (two of them had to answer on the spot on the telephone, and two had less than an hour to decide). Furthermore, for 55% (twenty-two) of forty residents, the longest deadline was a week or less. Thirty-four percent (sixteen) of all forty-seven applicants felt that they were given inadequate time to contemplate an offer. About 30% (fourteen) of forty-seven residents asked for more time to contemplate an offer. Eleven percent (five) of the forty-seven residents had an offer

withdrawn or lost because they did not give a response within a designated time frame (i.e., an exploding offer). About 50% (thirty) of sixty residents felt pressure to accept early offers, and 52% (thirty-two) of sixty-one had to accept an offer before finishing their interviews. Furthermore, 50% (twenty-four) of forty-eight residents accepted their first offer. Each resident canceled an average of almost three interviews (range, zero to eight interviews).

Residents felt that the ideal interview timing was from January through March of their PGY-4 year. Seventy-eight percent (fifty-one) of sixty-five residents thought a match would be better than the current system, if most programs would adhere to it, although some residents were concerned about the incentives for small fellowship programs to join. Some also wished for a centralized process that would be less stringent than a match, as they feared an “orthopaedic resident type match” would disempower them.

The results of the survey were then presented to the AOA-Orthopaedic Research and Education Foundation-Zimmer Resident Leadership Forum of 2007, which was held on June 13, in Asheville, North Carolina, and an audience response system was used to poll residents in attendance regarding potential solutions for fellowship hiring. The main focuses of the deliberations were to (1) enable a uniform, civil process of fellowship selection that permitted both the applicant and the program to thoughtfully consider programs and the pool of applicants available and (2) recommend a timeline for the process to allow residents to make informed decisions regarding specialty selections.

At the forum, all 112 residents were surveyed again and the response rate was approximately 83% (ninety-three residents). Their subspecialty interests were in similar proportions to those given in the online survey, with 6% interested in shoulder and elbow; 16%, in hand surgery; 9%, in foot and ankle; 29%, in sports medicine; 9%, in spine; 5%, in arthroplasty; 4%, in

pediatric orthopaedics; 8%, in orthopaedic trauma; 3%, in musculoskeletal oncology; and 11%, in none. As before, only 22% of the residents felt that the current system is fair to residents. Sixty-one percent of all residents (and 92% of those who were presently in a match) agreed or strongly agreed that a universal fellowship match would be better than the current system. When residents in a match process and those not in a match were compared, almost 89% of the residents in a match thought that the current process was fair but only 19% of those not in a match thought so. Some residents in both the survey and the forum were concerned about adherence to a match, and 61% felt that the best penalty for noncompliance was creating a blacklist on subspecialty web sites indicating those programs which had violated the match. While 47% of the residents favored a universal match or common notification date, 45% favored subspecialty-based reform with either a narrow period of interviews or subspecialty-based matches.

AOA Symposium

At the 2007 Annual Meeting of the AOA and immediately following the Resident Leadership Forum, there was a symposium dedicated to this subject. After the results of both surveys were presented at the symposium, an audience response system was used to question the present membership of the AOA. Seventy-nine percent of the 213 members attending the symposium thought the current fellowship process was unacceptable, and 87% felt the process was unfair to residents. Eighty-six percent thought that a universal match process similar to the resident NRMP match would be a feasible solution, and 73% favored a universal match (centralized clearinghouse) compared with 26% who favored a subspecialty-based approach.

Orthopaedic Matched Specialties

There are currently three orthopaedic fellowship match programs: hand surgery and foot and ankle surgery, which participate in the CMMP, and shoulder and elbow surgery, which participates in

a different match. Each match has unique features that help it work.

Hand Surgery: Why Does It Work?

Unlike sports medicine and spine surgery, the hand surgery fellowship match has been successfully administered by the NRMP since 1990. Over this time, the number of participating programs has remained constant at fifty-five while the number of matched fellowship applicants has ranged from seventy to 120. The match has always been strongly endorsed by the Hand Fellowship Directors Committee of the American Society for Surgery of the Hand (ASSH), and fifty-two of the fifty-five ACGME-accredited hand surgery fellowship programs participate in the match. One fellowship is nonaccredited and does not participate. The Hand Match Participation Agreement does not preclude one party from expressing a high level of interest in the other. Although not recommended, it is not a violation for an applicant or a program to tell the other how one will be ranked. Any attempt to request such information is a violation of the NRMP participation agreement and is subject to sanctions by the NRMP¹⁰. The hand surgery match has no clear penalty protocol for violating their agreement.

An Internet-based survey similar to the one administered to the Resident Leadership Forum class of 2007 was designed for the 406 candidate members of the ASSH who participated in the fellowship market between 2002 and 2006. Of the 406 candidate members, 232 replied to all of the questions for an overall response rate of 57%. Eighty-seven percent participated in the match. Ten percent of the residents were offered a position before match day. Thirteen percent of the residents were told where they were ranked. Four percent of the residents were offered a position by a program if they promised to rank that program number one. Five applicants withdrew after they were offered a position outside the match.

Overall, the resident assessment of the hand surgery match was positive. When asked about overall satisfaction

with the match, 77% were satisfied, while only 4% were dissatisfied. General comments were also solicited, and eighty-one (35%) of 232 residents responded. The most frequent comment (thirty-four of eighty-one respondents) was that the match was "good, fair, reasonable . . . must keep," while a few (eighteen of eighty-one respondents) felt that it was "good but too political."

Foot and Ankle: Why They Wanted It Back

In 1990, the NRMP had the first match for postdoctoral fellowships in orthopaedic foot and ankle surgery. From the very beginning, the foot and ankle match was not well publicized and the number of applicants was nearly that of the number of available fellowship positions offered. In the next ten years, the number of fellowship positions available exceeded the number of applicants and an increasing number of fellowship directors felt that they needed to offer positions outside the match. After several years of warnings that less than the requisite 75% of identified fellowship programs were complying with the NRMP, the foot and ankle matching program was disbanded in 2003. That is, the selection process reverted to the prior practice of exploding offers dispersed over time.

The leadership and membership of the American Orthopaedic Foot and Ankle Society (AOFAS) had begun in the late 1990s to try to (1) salvage the integrity of the match and (2) increase the number of qualified applicants for fellowships. Neither initiative was successful. However, an ad hoc committee initiated personal communication with all fellowship directors during the year after the matching program had been discontinued. By early 2006, >75% of the fellowship directors had signed agreements accepting the NRMP rules and procedures for a fellowship match. The NRMP accepted the initiative, and the matching program was reinstated in May 2007. This time, the AOFAS and its board of directors supported a policy of enforcing sanctions on those who violated the match

rules. Examples of sanctions include not allowing podium or poster presentations for a number of years at the annual meetings of the AOFAS, forbidding appointment as faculty for AOFAS courses, refusal of grant support from the AOFAS, and restrictions on advertising in *Foot and Ankle International*. Incentives to comply are also included in the agreement.

Shoulder and Elbow: Why a Private Match Works for Them

The American Shoulder and Elbow Surgeons (ASES) society experienced a similar problem with an unraveling market. After years of increasing chaos in their hiring market, ASES agreed in 2003 on a common notification time and date for offers, and applicants were then given one hour to decide after each call. This reform proved to be worse than the original problem since each applicant received numerous telephone calls at the common notification time, which was quite similar to the situation just prior to the adoption of the resident match². In fact, very few markets have succeeded in solving the problems of unraveling by simply attempting to specify uniform timing of offers⁴, largely because of the difficulty of dealing with the congestion that results when many offers have to be dealt with in a short time¹².

To improve the system, the ASES went to a manual match in 2005, i.e., a private non-NRMP match performed by a mutually agreed upon “independent” member of the ASES. This raised issues of reproducibility and validity; therefore, in 2006, a private non-NRMP statistician began to use a computer-based match system. Since the number of programs and applicants was small (nineteen programs and twenty-eight fellowship positions), two members of the ASES fellowship subcommittee also performed a manual match (with blinded institution and applicant rank lists) in each of the first two years that the computerized match was used, to validate the results. In both years, the manual match exactly replicated the results of the computer algorithm.

This private match featured an application deadline of October 2, 2006, for the selection of fellows for 2008 to 2009. Interviews had to be completed by Friday, December 1, 2006. A match list from each program and from each applicant had to reach the ASES office by fax, overnight mail, or regular mail by 5 P.M., central time, on Monday, December 4, 2006. Fellowship programs and applicants provided a telephone number at which they could be reached on Friday, December 8, and stated whether they wished this number to be given to (any) unmatched applicants and/or programs. The ASES office formally notified programs and applicants of the results on Monday, December 11.

This system enjoys some of the advantages of centralized matches generally—that is, applicants have the opportunity to interview and consider all programs without being forced into early commitment. There is nearly unanimous support from the residents. In addition, ASES has worked with the individual programs to coordinate interview dates to avoid conflicts and to coordinate regional interview times to minimize travel time, costs, and missed residency time.

The ASES society has traditionally conducted interviews and offered fellowship positions well prior to the sports medicine match to allow the residents who are interested in both specialties to go through the ASES process, and, if it does not work out, then continue to pursue sports fellowship opportunities. It may disadvantage sports medicine programs if an applicant is interested equally in both fellowships since it allows ASES fellowships to accept applicants earlier. It may also disadvantage ASES fellowships and residents who prefer some sports medicine programs but do not receive a match and become available only after the ASES programs are filled. A universal match would have the benefit that applicants could apply to both ASES and sports fellowships at the same time; e.g., those who preferred ASES fellowships would list

those at the top of their rank order lists.

Gastroenterology: A Model of Successful Reinstatement of a Match by Empowering Residents

The market for gastroenterology fellows experienced the same problems as the market for orthopaedic fellows. In particular, there was a gastroenterology match from 1986 until the late 1990s, after which the match was abandoned as programs sought to hire fellows earlier and earlier. The four principal gastroenterology associations (the American Gastroenterological Association, American College of Gastroenterology, American Society for Gastrointestinal Endoscopy, and American Association for the Study of Liver Diseases) found a way to reinstitute a match that may offer at least a partial model for orthopaedic surgery.

After ten years of suffering from the problems of an unraveling market, the gastroenterology fellowship directors sought to address these problems and reorganize around a centralized clearinghouse^{3,13-15}. Many fellowship directors, however, expressed concerns that their main competitors might not wait for the match but rather would continue to try to hire strong candidates before the match (these are exactly the concerns expressed by many orthopaedic fellowship directors). To address these concerns, and reinstitute the match, the gastroenterology organizations adopted the policy that, even if applicants had accepted offers prior to the match, they could subsequently decline those offers and participate in the match. This made it safe for programs to delay hiring until the match, confident that programs that did not participate would not be able to capture the most desirable candidates beforehand. The reintroduction of the gastroenterology fellowship match was based on the following resolutions¹⁶⁻²⁰:

This resolution addresses the issue that some applicants may be persuaded or coerced to make commitments prior to,

or outside of, the Match. Early offers and acceptances, and offers outside of the Match, are violations of the rules and of this resolution and are not condoned. Any applicant may participate in the matching process by registering for the Match to interview and consider match-participating programs; . . . [and then] by either resigning the accepted position if he/she wishes to submit a rank order list of programs or by withdrawing from the Match prior to the rank order list certification deadline, which is the first week in June. In addition, no program may withdraw a position from the Match after the quota change deadline to offer that position outside the matching process.

This had the effect of discouraging early offers, since residents were free to reconsider their acceptances after having subsequent interviews. This seems to have given many fellowship directors the confidence they needed to wait for the match, and the first two years of the reinstated match (run in June 2006 and 2007) seem to have been successful. The gastroenterology match for 2007 fellows was held in June 2006, and it succeeded in attracting 121 (79%) of the 154 eligible fellowship programs. Ninety-eight percent of the positions offered in the match were filled through the match, and so it appears that the gastroenterology community succeeded in making it safe to participate in the match, and thus in changing the timing and thickness of the market, while using a clearinghouse to avoid congestion.

Overview

The surveys, the Resident Leadership Forum deliberations, and the AOA symposium sent the clear message that the present system is unacceptable. The unraveled markets place pressures on residents and program directors to hire very early in the resident's training. The present orthopaedic fellowship hiring market is quite similar to other unraveling markets. The market is thin, and offers are made at early, dispersed times, with replies to offers expected quickly. It suffers from congestion and is unsafe for both residents and fellowship di-

rectors. Decisions—both offers and acceptances—are often made without careful consideration of which alternatives are most preferred. Indeed, the majority of residents accept their first offer, and many fellowship directors adjust their interview dates on the basis of market pressure and fill their positions before completing their interviews. The current situation will only worsen over time. Given the experience from gastroenterology, if large subspecialties do not reform and rejoin a match, interviews will continue to move earlier in the academic year. We expect that the fellowship hiring process for the orthopaedic subspecialties of sports medicine and spine surgery will continue to unravel, with interviews conducted earlier in the residency compared with specialties that participate in a match.

On the other hand, compared with the situation in specialties that do not use a match process, the limited number of functioning match programs work quite well. From an internal audit of the hand fellowship match, nearly 80% of the applicants are reasonably satisfied or satisfied. The vast majority of ACGME-accredited fellowships participate, and most programs adhere to the NRMP guidelines. The continued success of the hand fellowship match is believed to be related to the ASSH Hand Fellowship Directors Committee, which meets annually to discuss common issues related to fellowship education and experience as well as fellowship compliance with the match. This arrangement is quite similar to the ASES situation. Although the hand surgery and shoulder and elbow matches work well with a less regimented penalty structure, the recent reinstatement of the foot and ankle match created a rigid penalty code for violators. The reinstated match program rewards programs and their faculty that play by the rules and punishes those that do not. Both ASES and the ASSH Hand Fellowship Directors Committee agree that strong leadership from their respective societies with dedicated resources is critical to the future success of their respective matches.

The solution to the match remains to be determined. The AOA symposium responses supported a unified centralized clearinghouse model, while the residents were more divided between a unified match and subspecialty-based matches. There are advantages and disadvantages of both systems. One problem with separate subspecialty-based matches is that subspecialties with overlapping applicant pools compete with each other. The subspecialty that conducts the match earlier may have an advantage and capture residents who may have preferred the other subspecialty, but it also may lose out on some applicants who wait to see the result of the later subspecialty match. However, it may be less complex to come to a consensus regarding dates and sanctions in a subspecialty-based system since the subspecialty societies would institute their penalties and compliance as the AOFAS has done.

On the other hand, the advantages of a unified clearinghouse for multiple subspecialties are numerous. First, it is less expensive and more efficient to administer a single match rather than numerous separate matches. Second, application and match dates can be standardized for all orthopaedic residents. Third, it allows for residents to apply to more than one subspecialty, potentially increasing the pool of applicants to all subspecialties. Finally, penalties can be uniform and governed by one body.

A universal match seems to be the most promising way to unify interview and appointment dates. In fact, the majority of programs would prefer a fellowship match if other programs would also participate, i.e., if their competitors would not hire early and “cherry pick” the best applicants. The main issue remains, therefore, how to prevent early agreements.

While foot and ankle surgery has some successful strategies to bring fellowship directors on board, and provide incentives to participate in the match, it may prove to be hard to prevent some fellowship directors from making early

offers. An alternative to preventing early offers is to empower the residents and make it safe for them to remain available to other programs, while receiving early offers. This would reduce the temptation for programs to make early offers in the first place, as an early acceptance does not guarantee the final hiring of that candidate. A resident accepting an early offer would remain eligible to all other programs that participate in the match. The resident, upon continuing to interview, can still submit a rank order list to the match, as long as he or she informs the program, whose position the resident had accepted before the match, that he or she has decided to decline their offer and enter the match. That way, any resident remains eligible for the match and programs do not have to worry that other programs may remove promising candidates from the market before the match. This was the policy that gastroenterology used successfully to reinstitute its match.

In conclusion, it is quite clear that the present system is unfair to residents. This issue affects resident education since it forces residents to make career decisions without adequate knowledge. Although there are multiple models to rectify this situation, the best and safest model for all residents is to have a universal fellowship match with common dates and appropriate policies, as well as penalties for violators, that is policed and conducted by the NRMP or a similar organization.

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