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Regular Article

The pathology fellowship application crisis: The current state and suggestions for remediation

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A B S T R A C T

Problems within the Pathology fellowship application process in the US have been recognized and reported for years. Recently, members of the Graduate Medical Education Committee (GMEC) of the Association of Pathology Chairs (APC) and collaborators collected survey data from the residents themselves and the fellowship programs, as represented by both the fellowship program directors (members of the Fellowship Directors Ad Hoc Committee, FDAHC) and the program administrators (members of the Graduate Medical Education Administrators Section, GMEAS). These data are presented and discussed, and potential steps to resolve some of the problems around fellowship applications in pathology are presented.

Keywords: Fellowship, Match, Pathology, Pathology education, Subspecialty, Training

Introduction

The Pathology fellowship application process in the United States has been fraught with problems and controversy and has been the subject of much discussion over many years. In the accompanying paper, the history of these issues is reviewed and discussed.[1] The Graduate Medical Education Committee (GMEC) of the Association of Pathology Chairs (APC) has been grappling with the various problems associated with pathology subspecialty fellowships. Recently, members of the Committee and collaborators have collected survey data from representatives of the 2 main groups of stakeholders: the residents themselves, who are planning for, have applied to, or have accepted fellowship positions; and the fellowship programs, as represented by both the fellowship program directors (members of the Fellowship Directors Ad Hoc Committee, FDAHC) and the program administrators who support the application and selection process at both the residency and fellowship level (members of the Graduate Medical Education Administrators Section, GMEAS, of the APC). In this paper, we present these data and discuss the implications and potential steps to resolve some of the problems that have arisen over many years around fellowship applications in pathology, including a proposed common timeline for recruitment.

Methods

Resident survey

To better understand resident and recent graduate opinions regarding the current fellowship application experience, a survey was developed by residents and faculty within the APC GMEC. The primary goals of the survey were to assess the current state and timeline of the fellowship application experience and gather data and opinions from current trainees. The survey was developed using Google forms and the survey was sent to all pathology residency program directors (members of the Program Directors Section, PRODS, of the APC) via the APC PRODS listserv with a

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request that program directors forward it to their trainees. The survey remained open for 4 weeks in the spring of 2021. Several reminder e-mails were sent to the PRODS Listserv to encourage participation. The data were collected from Google forms and analyzed in Microsoft Excel.

The survey consisted of questions tailored to the current training level of the respondent. All respondents were asked to provide their practice location and stage in training, but no additional demographic data was collected to encourage honest responses. The survey asked general questions regarding current trends and timelines for fellowship application, including material preparation, application, and acceptance timelines. Data were also collected about fellowship subspecialty, intent to pursue 2 fellowships, and why. Those respondents who indicated they had accepted a fellowship offer were also asked if they had personally cancelled a fellowship offer, and if so, why. All respondents were asked a series of opinion questions, including "should the pathology fellowship application process be pushed later in training," "should the pathology fellowship process occur on a standardized timeline among other programs," and "should the pathology fellowship process be centralized (i.e., via ERAS or other mechanisms)"? All opinion questions had a companion option allowing for respondents to explain and provide further details. Multiple responses to these questions were allowed.

GMEAS survey

The GMEAS listserv, managed by the staff of the APC, consists of 217 Program Administrators of both Pathology Residency and Fellowship Programs. It is unknown what proportion of Administrators is responsible for managing Residency versus Fellowship programs (some do both). Respondents were asked to provide data for individual programs, not a cumulative response for multiple programs managed. The survey was distributed on March 17, 2021, via Survey Monkey.

Unexpected openings

Pathology residency directors (PRODS) communicate extensively via a Listserv managed by the staff of the APC. Approximately 346 participants on this Listserv represent 143 residency programs in the United States and Canada. This is a major mechanism of disseminating various types of announcements, including those of unexpected vacancies in fellowship programs at any of the PRODS member institutions. One of us (DCM) archives all such messages. When a pathology fellowship finds it has an unexpected vacancy within 18 months (or occasionally even earlier) of the start date of the fellowship position, the residency director will inform the Listserv so that the information can be disseminated to the residents who might be interested in applying for the vacant position.

For tabulating announcements of such unexpected vacancies, the e-mail archive from January 1, 2014, through May 31, 2021, was searched using the search terms "fellowship" and "unexpected," as well as by manually clicking through all of the messages. Notes were made of the date of the message on the listserv, the date at which the fellowship position was supposed to start (invariably July 1 of some year), and the subspecialty to which the fellowship is devoted. Note that the Listserv is the sole source of these data; positions not posted to the Listserv were not captured in this dataset.

FDAHC survey

In the spring of 2013, the APC formed a Fellowship Directors Ad Hoc Committee (FDAHC) with representatives from each of the boarded pathology subspecialty fellowships, plus "selective pathology" fellowships. The representatives mostly held leadership positions in the subspecialty-specific academic organization (e.g., the American Society of Cytopathology). The intent was that the members would work through their respective subspecialty societies to effect positive change to the fellowship application process. In early 2021, the FDAHC representatives were queried with specific questions regarding the fellowship election process and plans for standardization.

Results

Resident perspective

The survey was completed by 368 respondents between March 1 and April 1, 2021. The respondents included residents, fellows, and new to practice pathologists (Table 1). The majority (72%) of respondents were residents currently completing an AP/CP combined residency program, with the majority of those being fourth-year residents. The greatest number of respondents were from the Northeastern United States with 39% of respondents, but there were respondents from all parts of the country.

Further details about respondents to the resident survey are included in supplemental tables and figures. Sixty-seven percent of respondents reported that they had already applied for their first fellowship. All respondents were asked what subspecialty they intended to/chose for their first fellowship; the most common choice was surgical pathology (18%), followed closely by hematopathology (16%) (Supplemental Table 1). For those respondents who had applied for their first fellowship, the majority had started the application process during the second half of their second year of residency. The majority of respondents submitted their applications, completed interviews, and accepted an offer during the first half of their third year of residency (Supplemental Figure 1). When asked how these timelines were determined, the most frequently chosen response was "word of mouth at my program," with 73 responses (Supplemental Figure 2).

For those respondents who received fellowship offers, the most frequently indicated time frame in which programs required an acceptance of the offer was within 1 week of notification (82 responses), followed by no time frame (71 responses), 2 weeks (43 responses) and within 4 days (42 responses) (Supplemental Figure 3). Respondents were asked to provide the time frame for acceptance of the program offer they

Table 1
Demographic data of participants in the resident/fellow/new in practice survey.

Total Responses		368
Training Program		
AP Only		**22 (6%)**
	PGY-1	4
	PGY-2	7
	PGY-3	6
	PGY-4	5
CP Only		**15 (4%)**
	PGY-1	3
	PGY-2	7
	PGY-3	4
	PGY-4	1
AP/CP		**266 (72%)**
	PGY-1	43
	PGY-2	58
	PGY-3	76
	PGY-4	89
AP/NP		**5 (1%)**
	PGY-1	1
	PGY-2	1
	PGY-3	0
	PGY-4	1
	PGY-5	1
	PGY-6	**1**
Fellow		**57 (15%)**
	First-year fellow	40
	Second-year fellow	15
	Third-year fellow	2
New in Practice		**3 (1%)**
Practice/Training Location		
Canada, Quebec		2 (0.5%)
Midwest United States		81 (23%)
Mountain west		8 (2%)
Northeastern United States		138 (39%)
Southern United States		71 (20%)
West Coast United States		57 (16%)

ultimately accepted, and the most frequently chosen response was no time frame with 69 responses followed closely by within 1 week with 68 responses. When asked how offer acceptance timelines affect the fellowship application process, the most numerous response was "prevents applicants from exploring all fellowship opportunities" with 172 responses, followed by "puts undue pressure on applicants" with 132 responses (Supplemental Figure 4).

When asked about intent to pursue a second fellowship, 49% of respondents chose "yes," with another 18% choosing "maybe" (Supplemental Figure 5). When asked about factors influencing their decision to pursue second fellowship and particular subspecialties for such a fellowship, the most frequently chosen response was "personal interest" with 181 responses, followed closely by "job marketability" with 175 responses (Supplemental Figure 6). When asked about fellowship offer cancelation, 5% of respondents had personally canceled an accepted fellowship offer and indicated that accepting another fellowship offer followed by another job offer were the most frequent reasons for cancellation. (Supplemental Figures 7 and 8).

An overwhelming majority of respondents (84%) agreed the pathology fellowship application process should occur later in training. When asked why fellowship applications should be pushed later in training, the most frequently chosen response was "My interest in fellowship may change during residency," with 247 responses (Fig. 1 A and B). A similarly large majority of respondents agreed that the fellowship application process should also occur on a standardized timeline (87%), with the most frequently cited reason being "doing so levels the playing field for fellowship applicants, not only within a subspecialty but also between subspecialties" with 272 responses (Fig. 2 A and B). However, there was no great consensus as to whether

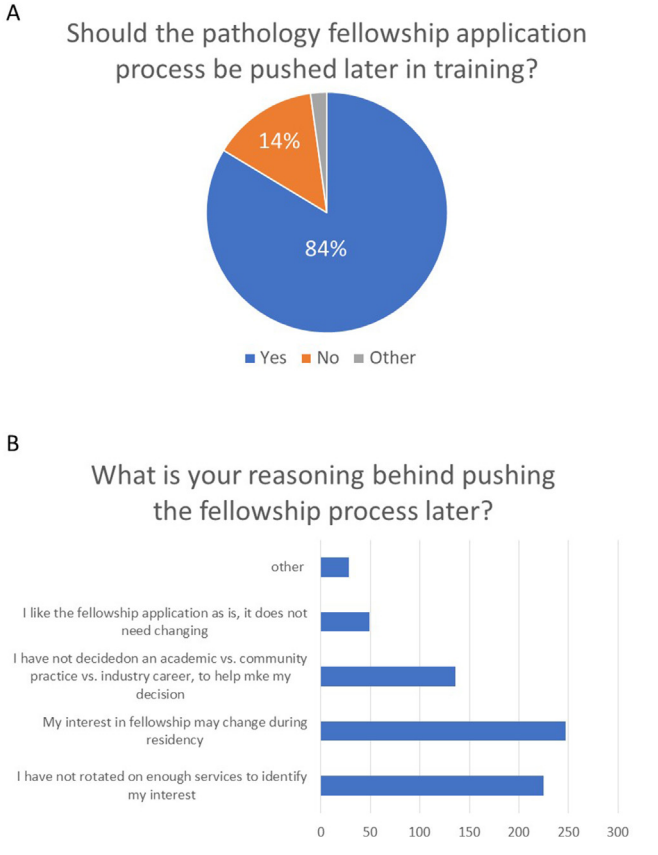

Fig. 1. Responses from the resident/fellow/new in practice survey regarding the timing of the fellowship application process showing 84% of respondents believe the fellowship application should be pushed later in training (A) for various reasons (B), presented as total responses. Respondents were allowed to select multiple reasons.

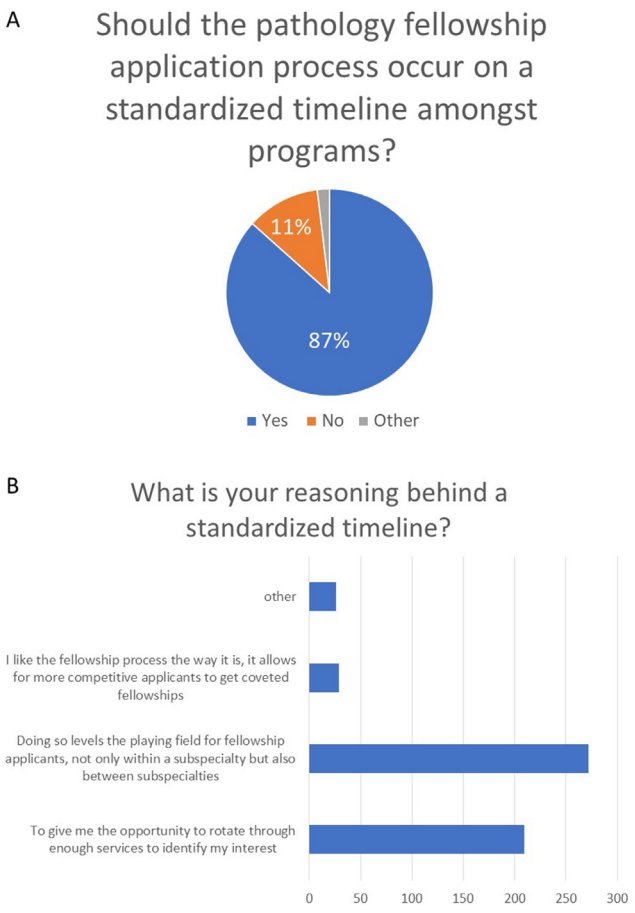

Fig. 2. Responses from the resident/fellow/new in practice survey regarding standardizing the fellowship application process timeline showing 87% of respondents believe the fellowship application timeline should be standard across all programs (A) for various reasons (B), presented as total responses. Respondents were allowed to select multiple reasons.

centralization of the application and selection process would be beneficial, as only 51% of respondents thought the application process should be centralized, followed closely by no at 42%. The most cited reason for endorsing centralization was "this helps make a uniform timeline for application later in training" with 193 responses, and the most cited reason against centralization was "going through ERAS is added expense" with 127 responses (Fig. 3 A and B).

GMEAS perspective

Ninety-six responses (44.2%) were collected, representing programs of all subspecialties (Table 2), regions, and sizes. The data collected showed interesting trends: 85% of programs begin accepting applications 18–30 months prior to the start date (Fig. 4), while 36% of programs indicate no deadline or deadline of less than 12 months prior to the start date (Fig. 5). This may indicate a pattern of rolling admission for a significant portion of Pathology Fellowship programs, a situation that inserts unpredictability into the system and may promote the pattern of earlier and earlier applications by residents hoping to secure a position before it is filled by another candidate.

About half of the fellowship programs reported losing an incoming fellow in the past 5 years, leading to additional work on the part of the program administrator and added expense to find a replacement fellow (Figs. 6–8). It was not determined what proportion of these late recruitment efforts was successful versus how many late fellowship positions went unfilled.

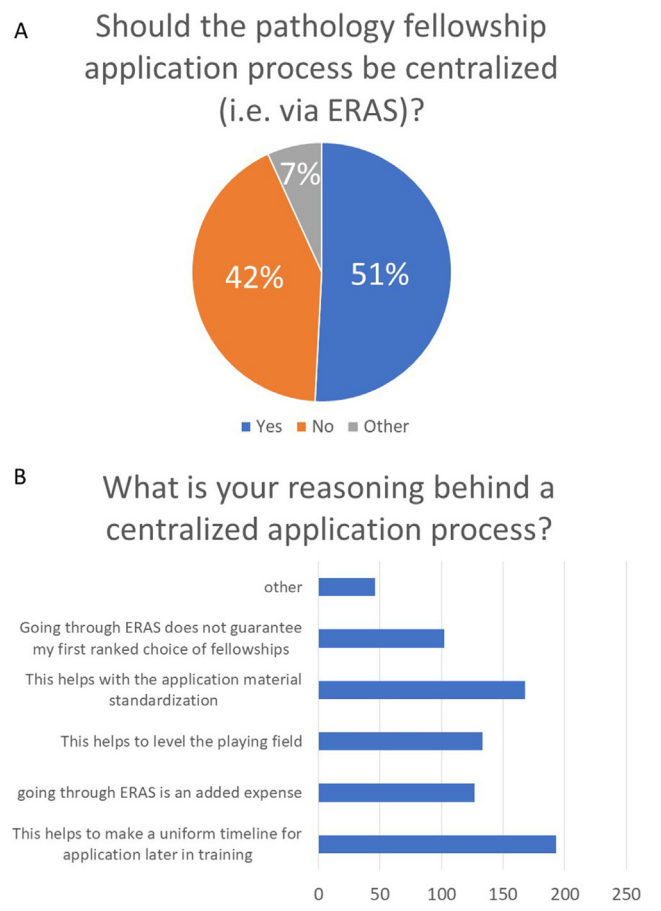

Fig. 3. Responses from the resident/fellow/new in practice survey regarding centralizing the fellowship application process across all programs (A) for various reasons (B), presented as total responses. Respondents were allowed to select multiple reasons.

Thus, from an administrative perspective, the data supports the idea that the current Pathology Fellowship recruitment timeline has shifted earlier, in some cases as far as 3 years ahead of the start date, with residents applying for fellowships in their very first year of residency. Data show that recruitment may have taken on a rolling nature, with no defined period of accepting applications, interviewing applicants, and offering positions. General timelines may exist within subspecialties; however, administrators often manage programs across multiple subspecialties. Data show that many programs have experienced positions being offered, accepted, and then abandoned before the start date. Whether this is correlation versus causation is discussed in other sections of this paper. From a management perspective, these data present an

Table 2
Graduate medical education administrators section survey demographics.

Subspecialty	Responses (%)
Blood Bank/Transfusion Medicine	18 (19)
Clinical Chemistry and Immunology	2 (2)
Clinical Informatics	1 (1)
Cytopathology	23 (25)
Dermatopathology	6 (6)
Forensic Pathology	6 (6)
Hematopathology	15 (16)
Medical Microbiology	5 (15)
Molecular Genetic Pathology	6 (6)
Neuropathology	2 (2)
Pediatric Pathology	3 (3)
Surgical Pathology	7 (7)
Other	0

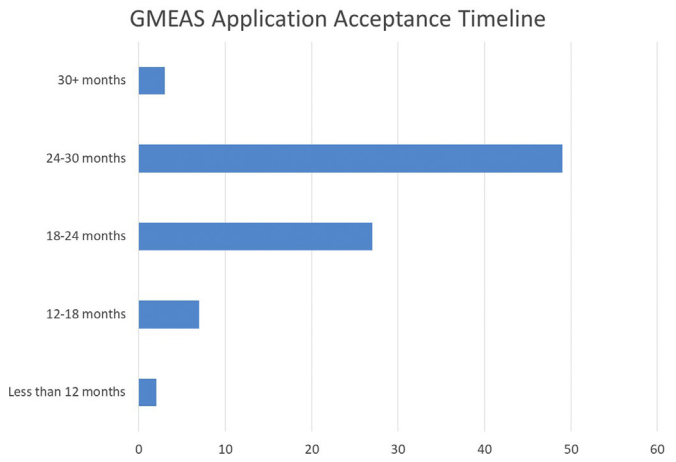

Fig. 4. Responses from the GME Administrators Section survey question "how far ahead of start date do you begin accepting applications for your fellowship position(s)?" regarding the timing of the fellowship application process, presented as total responses.

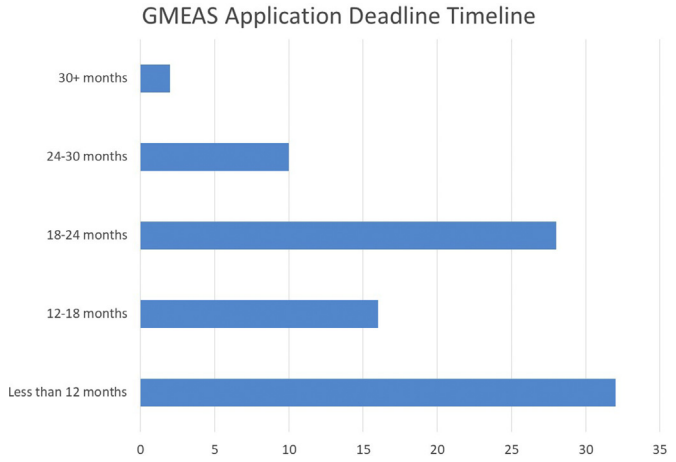

Fig. 5. Responses from the GME Administrators Section survey question "how far ahead of start date is your deadline for application to fellowship position(s)?" regarding the timing of the fellowship application deadline, presented as total responses.

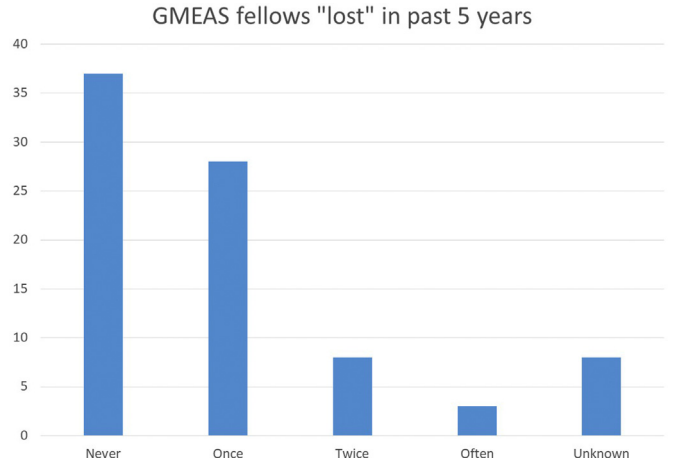

Fig. 6. Responses from the GME Administrators Section survey question "in the past 5 years, how many times have you "lost" an incoming fellow for this fellowship program you manage?" regarding accepted fellow retention, presented as total responses.

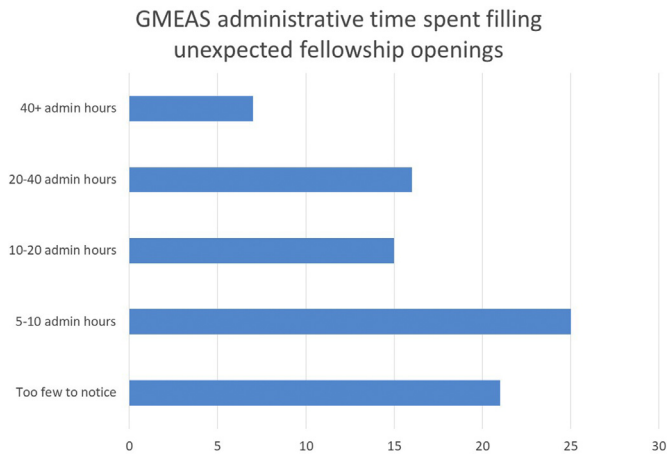

Fig. 7. Responses from the GME Administrators Section survey question "in your most impacted year, approximately how many admin hours did you spend working to fill unexpected Fellowship openings in your Department?" regarding additional administrative work spent on filling unexpected fellowship openings, presented as total responses.

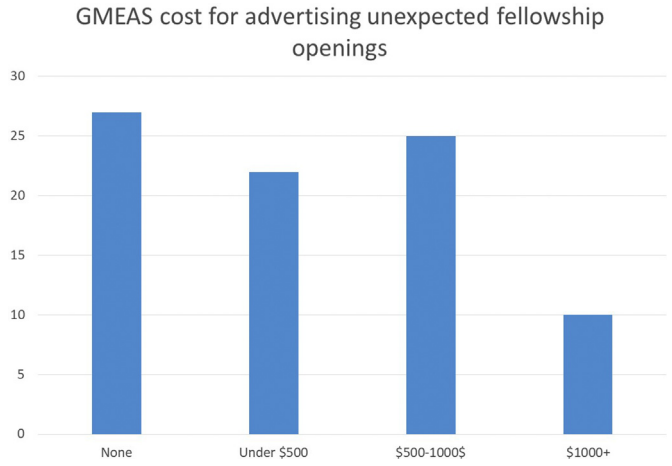

Fig. 8. Responses from the GME Administrators Section survey question "approximately how much money does your department spend advertising unexpected Fellowship openings?" regarding additional cost spent to fill unexpected openings fellowship openings, presented as total responses.

impact on the ongoing and increasing workload for the GME administrator in Pathology. Of note, the ACGME requires that each accredited fellowship program have 0.2 FTE administrative support, meaning that some administrators may manage up to 5 accredited fellowships. This may not include nonaccredited specialty programs. Administrator burnout has been a topic of discussion at the national level for the past few years.

The GME program administrators thus support a defined recruitment window that begins preferably 18 months prior to the start date of fellowship and would also support an NRMP or other match program for the most widely sought specialties. A pan-Pathology approach to recruitment for all subspecialties might further avoid inconsistencies.

Unexpected openings

Analysis of archived unexpected fellowship openings is summarized in Fig. 9 and Supplemental Table 2. A total of 170 listserv postings of unexpected openings in pathology fellowships were found from January 1, 2014, through May 31, 2021. These announcements used to be rare: for example, from February through May of 2014, the e-mail archives contained only 2 such notices for fellowships starting on July 1, 2014,

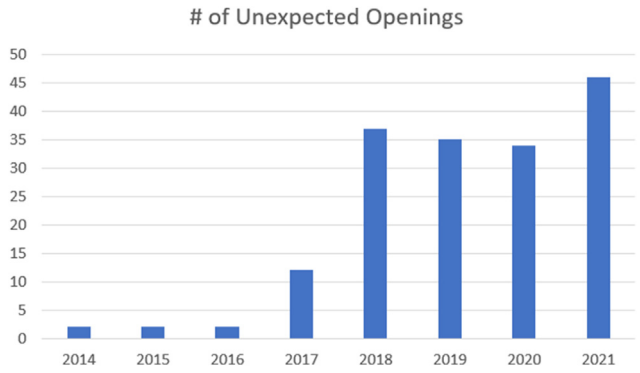

Fig. 9. Rising numbers of unexpected fellowship openings based upon postings to the PRODS listserv.

and 2 additional notices during 2014 for a start date of July 1, 2015. However, there was a marked increase in the number of such notices per year, to a high of 45 in the most recent (2020–2021) academic year. More such announcements of unexpected openings occurred in the 6 months immediately prior to the starting date of fellowships (thus from January to June for fellowships starting July 1 of the same year) than occurred from July through December for the following July.

The types of fellowships with unexpected openings included the more common fellowships sought by pathology residents. The subspecialty with the most frequent unexpected openings was Cytopathology (45, 26%), followed by Surgical Pathology (including 2 "Thoracic Pathology" and several "Oncological Surgical Pathology") (39, 23%), and Hematopathology (29, 15%). Smaller numbers of unexpected openings were reported for Blood Bank/Transfusion Medicine (16, 9%), Gynecological Pathology (including fellowships labeled as "Women's Health Pathology" and Breast Pathology) (8.5%), Gastrointestinal Pathology (including Liver Pathology) (7.4%), and Genitourinary Pathology (6, 3%). There were 4 openings in Pediatric Pathology fellowships (2%), 3 in Molecular Genetic Pathology (2%), 2 each in Forensic Pathology, Bone and Soft Tissue Pathology, and Neuropathology (1% each), and 1 each in Renal Pathology, Clinical Informatics, and Transplant Pathology (0.5% each).

FDAHC perspective

The lack of a structured fellowship application process has been cited as a root cause of the push for earlier and earlier decision-making, in many cases, before residents gain significant exposure to subspecialty areas, including some with the greatest need for a pipeline to bolster their pathologist workforce, for example, pediatric pathology, neuropathology, blood banking/transfusion medicine, and forensic pathology.[1,2] While past attempts at standardization have failed, the FDAHC recognizes the negative impact on our trainees, and continues to work toward a common calendar or match in some areas.

In the Spring of 2021, the FDAHC members were surveyed about their subspecialty section's plan for the upcoming recruitment season and the likelihood that the section would implement a uniform application timeline or a match in the near future. Additional developments in each subsection were monitored over the summer for new developments, and these data were added. Details can be found in Supplemental Section 1. As shown in Table 3, the responses covered a broad range, from the plan by Forensic fellowships to move to the NRMP match for fellowships that begin in 2024 to several subspecialty sections that would not consider a uniform timeline or match for the foreseeable future.

Discussion

Issues with the fellowship application processes are not unique to Pathology. Many other specialties have been confronted with an

Table 3
Fellowship recruitment plans among various pathology subspecialties.

Status as of August 2021	Fellowship
NRMP Match for fellowships that begin in 2024	Forensic Pathology
Introduction of Uniform Timeline for fellowships that begin in 2023	Dermatopathology Cytopathology
Agreement to Uniform Timeline	Molecular Genetic Pathology
Agreement to institute formal match process in 2021	Clinical Informatics
Recent poll suggests openness to discuss moving to a match	Hematopathology
May be open to a match or uniform timeline later	Transfusion Medicine/Blood Banking Microbiology
No strong interest in a uniform process or match now	Chemical Pathology Neuropathology Pediatric Pathology

unregulated application process, and the majority have turned to a match through the NRMP or another match algorithm. These steps provide deadlines throughout the process and move the job of monitoring adherence to an outside agency, rather than the specialty societies or some other organization within medicine.

Pathology fellowships are somewhat unique among other medical specialties. Most Pathology fellowships are 1 year in duration (Neuropathology is 2 years and some fellowships in other areas may offer/require an additional year, usually spent in research). This differs from the 3-year commitments required in Internal Medicine and Surgical fields. Another difference is that a fellowship in Gastroenterology is required if an Internal Medicine diplomate wants to spend their career doing endoscopic procedures, while pathologists who are board-certified in Anatomic and/or Clinical Pathology can practice in the subspecialty areas of those disciplines without completing advanced fellowship training or certification.

One specialty where the fellowship landscape is similar to Pathology is Radiology. Most radiology fellowships are 1 year in duration, and many of the fellowship disciplines (e.g., Abdominal Imaging, Musculoskeletal Radiology, Cardiac and Pulmonary Radiology) involve practice components that any radiologist who has completed residency training can perform. As with Pathology, some radiologists complete more than 1 fellowship, although much less frequently than in Pathology.[3] Some radiology fellowships also share governance with another organization, as Neuropathology and Dermatopathology do. Also, not all radiology fellowships are ACGME accredited, similar to organ-specific fellowship programs in surgical pathology. Radiology as a field has experienced similar issues with their fellowship selection process over the years, including attempts at a common calendar, a match, and other arrangements. Presently, they employ a mixture of match and common calendars among their various subspecialties. Radiology's struggle is remarkably similar to ours in Pathology, and ultimately, we may learn from their experiences. At present, some radiology subspecialties do participate in a match, while others adhere to a common calendar, and the drivers of change in the radiology fellowship selection process appear to be very similar to those in Pathology.[3,4] A detailed chronicle of Radiology's journey to a uniform application timeline for all fellowships, with some disciplines in the NRMP match, and some outside the match appears in Supplemental Section 2 (Supplemental References 1-6).

The survey results presented in this paper confirm that the long-standing concerns of pathology chairs and residency program directors over the process and timing of fellowship acquisition[1,2] are shared by current pathology residents. These issues are not new but have been reported in previous surveys administered over the past twenty years, which show remarkably similar data regarding the timelines for recruitment and the desire for changes in the recruitment process.[1,5–10] The vast majority of residents responding said that the fellowship application process should be moved later in training, and reported that they had to "start the application" process during their second year of residency or even earlier. Presumably, deciding on a subspecialty fellowship must therefore be taking place well before the end of the second year. This is in contrast to the situation in medical school, also generally a 4-year curriculum, where specialty clerkships occur primarily in the third year and where applications to residency do not begin until the first half of the final year. In fact, the timing of residency applications by medical students is intentionally set to occur after most or all of the major specialty clerkship experiences. When the COVID-19 pandemic delayed the clerkship experiences of medical students in 2020, the AAMC delayed the opening of its Electronic Residency Application Service (ERAS) to allow medical students to have completed more specialty clerkships before applying to residency programs.

Can an informed choice of subspecialty focus be made based on the experiences of a resident in their first 12–18 months of training? The curriculum of some programs divides years of residency along AP and CP lines, with the first 12 months (or occasionally more) being exclusively AP. Even in programs where the curriculum gives equal exposure to AP and CP in each year, it is hard to imagine that the choice of residents can be optimally informed when the residents responding to the survey report choosing among twenty different subspecialty fellowship areas. In a 2015 survey looking at curriculum issues,[11] 79% of pathology program directors indicated that they did not feel that residents had sufficient exposure by the mid-point of their second year of residency to decide on what fellowship to apply. The results of our resident survey resoundingly (84%) support a need for more time to decide. Yet, of the pathology subspecialties seeking to implement a standardized timeline, only Forensic Pathology and Clinical Informatics actually shorten the timeline to less than 21 months, and both of them are doing it in the context of a formal match.

At the time of the current survey, two-thirds of the residents responding had already applied for fellowships. A corollary to the issue of the timing of first fellowship applications is the timing of second fellowship applications. Doing a second fellowship is common. 49% of the respondents said they definitely plan to do a second fellowship; 18% say they might do a second one. Many of them must have already applied since the timeline for applications would place applications for the second fellowship in the third year of residency. More than half of the respondents cited marketability or the need for more subspecialty training as the reason for the second fellowship. Yet the early timeline for second fellowship applications 2 years in advance forces residents to decide on whether to do a second fellowship and in which subspecialty before they have ever had a chance to test their marketability or gauge their final training needs. The perceived value of a second fellowship thus becomes fixed in place even in the face of an improving job market. Some residents, of course, belatedly recognize that they are marketable with only 1 fellowship, and a subset of those defy the appearance of lack of professionalism by withdrawing from a previous commitment to a fellowship position in order to take a job. In the present survey, 25 (5%) of respondents admitted to withdrawing from a committed fellowship position, and 4 of them stated it was because they got a job offer.

Residents also withdraw from fellowships because they have taken a different one. In the present survey, 10 (5%) of the respondents who admitted to withdrawing from a fellowship commitment did so in order to take a different fellowship. The reasons for taking a different fellowship are more complex than getting a job. Withdrawing might occur because the resident has found another subspecialty of interest in the 2 years of additional experience between their acceptance of the fellowship offer and the actual beginning of the fellowship. Clearly, expanding interests drive second fellowships to some extent, as is reflected in the survey results, where personal interest appears equal to marketability as a motivator, and expanding interests and altered professional goals likely account for many instances of "unexpected openings" in fellowships. Withdrawing from a fellowship in order to accept another in the same subspecialty, however, is mainly a consequence of the nonstandard timeline, which is yet another very significant feature of the current dysfunctional system. A resident may have to

decide upon an offer from a less favored fellowship while a more favored and perhaps more competitive fellowship is still considering applications. This dilemma is compounded by the expectation of the offering program to receive a rapid response. The survey shows that the majority of programs expect a response to an offer of a fellowship position within 1 week. Among the subspecialties attempting to implement uniform timelines, both Cytopathology and Dermatopathology specify an expectation of a response within 72 h.

The increasing visibility of notices of "unexpected openings" in fellowships reflects this trend and the inconvenience and distress it causes to fellowship directors and administrators. These openings trigger additional work and potentially a chain reaction of candidates reshuffling into open positions. We have not quantified the negative impact of leaving a fellowship position unfilled. There is also a theoretical injury to the resident who might have chosen that fellowship but had to accept an alternative position because, at the time, the one they preferred was already taken. Nevertheless, it is difficult to criticize the residents who withdraw their acceptances when they are clearly faced with a system that puts them at such a disadvantage. The decision to renege on a fellowship commitment may not be professional, but within the current dysfunctional system, it is at least understandable.

What do residents need? Part of the answer is clear from the numbers and is essentially the opposite of what exists now. 87% want a standardized timeline for the fellowship application and acceptance process, and 84% want the process to occur later in training. The comments that were returned with the survey provide additional detail on what an optimal process might include. Residents need complete and accurate information on fellowship programs provided by the programs themselves, ideally as a single centralized resource that residents could use for free. The survey shows that most residents determined the timeline for their fellowship applications by word of mouth; information obtained from the programs themselves was the least common source. Residents would also like there to be a standardized application, as opposed to preparing something unique for each fellowship to which they apply, wasting time and energy. The Electronic Residency Application System provides not only a standardized application but also a venue for programs to provide information and a means for standardizing the application timeline, yet only 51% of survey respondents favored it as a centralized option. The objection to centralization through ERAS, as expressed in the comments, rests primarily with its cost for the applicants rather than with the service it provides.

The expense of applying to multiple programs through ERAS highlights another problem with the current system: the need to apply to large numbers of fellowship programs in order to ensure getting a position, especially in the more competitive subspecialties. Residents would be better served by a system in which they could focus their applications on preferred programs, obtain a relatively rapid yes or no answer, and then still have the opportunity to apply to less favored programs, if necessary, rather than covering all options with large numbers of applications upfront. A staged system of applications and acceptances is actually the essence of the NRMP's supplementary match, although a staged fellowship application process would have to take place over more than several days. Nevertheless, the shift to virtual interviews, in addition to reducing travel costs for residents, allows for interviews to be arranged on short notice without the complication of travel and lodging arrangements.

Residents also find it difficult in the current system to know if a fellowship has available positions. They would benefit from a dynamic list of positions, showing which are filled and which are available. This too would be similar to the dynamic list of available openings provided by the NRMP for the supplementary match after the main residency match; however, it would need to remain active throughout the recruiting period and possibly indefinitely.

Of course, the most effective way to standardize how programs carry out the fellowship recruitment process would be through a fellowship match. While some reluctance to a match stems from a natural desire for freedom of action, there are some very real drawbacks to a conventional match as operated by the NRMP in the residency application and selection process. The draft-like NRMP match establishes a high-stakes process in which all options must be investigated and ranked upfront. This tends to inflate the number of applications that must be submitted in order to maximize the chances of securing a position. Applications often do not reflect the specific interest in the program so much as "casting a wide net." Furthermore, because time must be allotted for all interviews in a single unstaged system, there is a long delay between application, interview, and outcome (Match Day).

A conventional match also makes no allowance for internal candidates for fellowship positions, yet internal candidates are an important consideration for both programs and residents in the selection process. 14% of survey respondents did not think that the application process needed to be pushed later, and 11% did not think that a standardized timeline was needed. This group of residents was not further defined; however, it is likely to include many who have obtained their fellowships as internal candidates or hope to do so and would not benefit from being thrown into the larger applicant pool, as happens with a standard match. Although a minority, this group is an important constituency for both residency and fellowship programs. Residency programs in their own recruiting efforts may use the existence and potential availability of fellowships at their institution as a selling point. Likewise, residency applicants may view potential fellowship opportunities as an attraction, both from the standpoint of reflecting the subspecialty strengths of an institution, as well as from the very practical aspect of not having to relocate for a 1-year fellowship. Some residency programs along with an affiliated fellowship might even choose to guarantee a fellowship position to an outstanding residency applicant; and the association of residency with the fellowship is even tied at the level of joint certification in the case of combined Anatomic Pathology and Neuropathology. Some residents, as expressed in their comments in the survey, view internal candidates as possessing an unfair advantage. However, the advantage only exists for residents who have performed well. For fellowship programs, the advantage of internal candidates is self-evident in supplying the ultimate "audition" for the fellowship position. For improving the status quo, the standardized timeline must include an early date for programs to consider interested internal candidates in advance of external applicants while still allowing the resident or the program to forgo the early internal opportunity in favor of the subsequent dates of the standardized timeline for interviews and offers (see Table 4).

Just as the resident who withdraws from a commitment to a fellowship position should not be regarded as unjustifiably unprofessional, the behavior of the fellowship programs in the current system is understandable as well. Their natural goal is to recruit the best fellows possible. Yet they, like the residents, suffer from a general lack of knowledge of what other programs are doing and when they are doing it. Without a standardized timeline, defensive measures push each program to lock in its fellows before another program can snap them up. There is no reason to believe that fellowship programs want to push residents into premature decisions about subspecialty interests and fellowships, and the negative consequences are apparent in the proliferation of unexpected openings. However, most fellowship programs have learned from experience that they cannot trust the current system. Unfortunately, voluntary timelines have failed in the past.[1] This may be because of a few prominent violators, but it may also in part be because the existence of internal candidates muddies the situation concerning what is and is not acceptable in the timing of offers.

The recognition that change is needed is reflected in several pathology subspecialties attempting to implement uniform timelines within their subspecialty, and Forensic Pathology and Clinical Informatics implementing subspecialty matches of their own, in the absence of a general agreement on a subspecialty match.[12,13] However, multiple subspecialty timelines that are not synchronized do not take into consideration that a resident might be interested in applying to more than one subspecialty simultaneously. After all, the survey shows that nearly half of residents who intend to pursue a second fellowship are

Table 4
Needs and recommendations for pathology fellowship recruitment.

Recommendations	Comments
Standardized timeline – optional initial date to lock in internal applicants, if mutually desired (earliest date: 25 months/June 1)	Programs and their internal applicants should be able to lock in an offer and acceptance before open interviewing begins, if both parties agree. The program then will not make further attempts to fill that position, and the resident will not seek another position for that year. Utilizing this stage is optional; either the program or the resident can choose instead to go through the open interview/offer process following that part of the standardized timeline. However, the internal offer and acceptance, once made, should be viewed as final.
Standardized timeline – earliest date for offering and doing interviews (−23 months/ August 1)	Adherence to these dates is the most essential element of the proposal from the standpoint of the programs, since programs must be able to trust that they will not be outflanked by competing programs attempting to secure better candidates by capitalizing on the insecurity of the applicants through early offers of positions.
Standardized timeline – earliest date for offering a fellowship position (−21 months/Oct 1)	
Standardized response time for the applicant to accept or decline an offer of a position (3 business days)	There must be a balance between applicants being pressured into a rapid decision before alternative possibilities/offers can be considered versus programs having to wait too long for a refusal before making an offer to another applicant.
Dynamic list of open and filled positions (available from −26 months/May 1)	For the applicants, a comprehensive free list of open positions is a critical part of the proposal. This dynamic list of unfilled positions needs to be available once internal candidates can be locked in but before the beginning of open interviews so that residents can direct their applications only to open positions. Programs should have 1 business day to remove a position from the open position list once an offer for that position has been accepted since an applicant who receives an offer needs to know which of their other applications remain viable in order to give a timely and well-informed acceptance or refusal.
Expectation that applicants will promptly withdraw applications to other programs once they have accepted a position.	In the absence of a binding match, there should be a firm expectation that within 2 business days an applicant will notify all other programs to which they have applied that they have accepted a position elsewhere. While it is not practical to keep a list of applicants comparable to the dynamic list of open/filled positions, fairness demands that applicants promptly let a program know that they have accepted another position, so that programs too can make well-informed decisions about further offers of interviews/positions to other applicants. Programs could include as part of their offer letter to be signed by the applicant a statement that the applicant will promptly withdraw other applications and not seek alternative positions for the same academic year.
Comprehensive centralized listing of fellowship programs with useful information	While applicants can find much information through Internet searches, a centralized source of information about fellowships would be helpful.
Standardized application packet	While not essential to the fellowship application process, residents clearly stated that a standardized application packet for all programs (without the expense of ERAS) would make the process much easier for them.
Virtual interviews	While not a topic covered by the surveys reported in this paper, it should be noted that virtual interviews allow for a more compressed timeline of the interview-offer process, since the necessity for making travel arrangements has been removed and interviews can be arranged on relatively short notice. It is hoped that this may facilitate a shift toward a later timeline for the process, which was a very strong recommendation of the applicants and one of the main drivers for the APC-PRODS organization to address the issue of fellowship recruitment.

doing so out of personal interest. To be interested in more than one subspecialty area of pathology should not and probably does not have the same negative connotation as applying to two specialties in the residency match. It could be advantageous for the resident interested in two subspecialty areas to apply in both initially through a single synchronized selection process rather than deciding in advance in what order to do the two fellowships. While the efforts of the individual subspecialty groups to establish order are admirable, the result may still look chaotic to a pathology resident deciding among several subspecialties.

Conclusion and proposal

We must optimize this broken system. Residents need a standardized timeline across subspecialties and programs, a standardized application and acceptance process with minimal cost, a centralized source of information about fellowship programs, a dynamic list of filled and unfilled fellowship positions, the ability to target smaller numbers of applications to their most favored programs, rapid turn-around on applications and acceptance offers, the ability to secure an open fellowship position at the last minute if they cannot find a job without waiting a year for a match, and accountability on the part of programs to follow the rules. Programs also would benefit from a standardized timeline, the ability to consider internal candidates, and a mechanism to fill late or unexpected openings at odd times. We have summarized these needs and recommendations in Table 4.

As seen from this and previous manuscripts, we have been doing a disservice to our trainees, our training programs, and our field with our current processes. The most efficient system for the fellowship recruiting and selection process would be a match, and several pathology subspecialties have already committed to using a match process to fill their fellowship positions. We applaud their initiatives, and this proposal is in no way intended to undermine those efforts. Instead, this proposal aims to help the remaining subspecialties standardize their timelines and processes moving forward. The dates in our proposal represent what we feel can be implemented now. It is our hope that they can eventually be shifted even later in training as programs become more comfortable with a standardized timeline. At some point, transitioning to a pan-pathology match may become a simple next step.

As leaders in academic pathology, it is our responsibility to fix this problem – to demonstrate collegiality and professionalism by adopting and adhering to a common timeline for subspecialty fellowship recruitment in pathology. While participation in a match process may follow in the future, the standardized timeline is a step we can take in the present. The time for change is now!

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Supplemental material

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