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More Signal, Less Noise: The Electronic Residency Application Program Supplemental Application in Radiology Match

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BACKGROUND

Radiology recruitment is under unprecedented stress because of over-application [1] compounded by remote interviews during the coronavirus 2019 disease (COVID-19) pandemic [2]. Since its inception in 2001, the Electronic Residency Application Program (ERAS) made applying to residency programs easy, which led to explosive growth of applications [3] and prevented program directors from performing in-depth application reviews, relying instead on the United States Medical Licensing Examination (USMLE) Step 1 score and geographic location filters [4]. This disadvantaged minorities and students of lesser means who were unable to afford preparatory courses or travel to outside rotations. Recently, the remote interviews forced by the COVID-19 pandemic eliminated the cost of travel and allowed medical students to apply to and interview at even more programs.

Being a limited resource, residency interviews are allocated only to those applicants deemed genuinely interested and likely to match to the program. Until recently, residency programs could only guess which students were truly interested. It is no surprise that the trial of preference signaling by otolaryngology [5] sparked interest in the radiology graduate medical

education community. The idea of preference signaling comes from the American Economic Association, which uses signaling in the job interview process for graduate students [6]. In their model, applicants sent signals to up to two employers indicating their interest, with increased probability of an interview at a signaled institution. Tellingly, signaling was particularly helpful to those applicants more likely to be overlooked (graduates such as postdoctoral fellows and assistant professors) and to employers concerned that they were getting applications simply because the candidate was applying widely (liberal arts colleges with high teaching loads and institutions located in small towns).

This experience suggested that when the number of signals was low, signaling imparted greater credibility to such applications, and the absence of a signal did not convey disinterest and did not prevent other qualified applicants from being seriously considered. Based on this, the otolaryngology community incorporated five signals into their 2021 match season. The postmatch applicant survey showed that there was a vastly greater chance of receiving an interview from a signaled program (58%) compared with a nonsignaled program (14%) and that

77% of applicants and 91% of program directors (PDs) strongly favored continuation of signaling in the subsequent matches [5].

SIGNALING IN THE RADIOLOGY MATCH

The radiology academic community has debated signaling for some time. The 2018 survey of radiology PDs by the Matching Plan Committee of the Association of Program Directors in Radiology (APDR) demonstrated that 75% of all respondents supported an “early action” period at the beginning of the interview season when medical students would apply to a limited number of programs (eg, 10). At that time, ERAS would not consider a trial of signaling. However, after otolaryngology’s successful signaling initiative, in 2021, ERAS initiated a pilot allowing applicants to signal five programs in internal medicine and surgery and three programs in dermatology. In addition, the ERAS supplemental application allowed applicants to describe up to five of their most meaningful life experiences and choose their geographic preferences to facilitate holistic review and lessen location bias. The supplemental application user survey [7] shows that the majority (83% dermatology, 82% internal medicine, and 75% surgery) of PDs found signaling helpful to

identify applicants who they would otherwise have overlooked. At the same time, 57% of applicants agreed or strongly agreed that preference signals may help them be noticed by programs in which they have the most interest [8].

After the supplemental application was announced in the summer of 2021, the APDR Matching Plan Committee initiated discussions with the ERAS team regarding radiology's participation in the next cycle (ERAS 2022). The guiding principles of this ERAS innovation—equity, no harm, adding value in an evidence-based process—aligned with the goals of the APDR. Furthermore, because the National Board of Medical Examiners' decision to convert the USMLE Step 1 score from numeric to pass or fail takes effect this year, the need for holistic review of applications in the coming interview season is expected to be even more acute, making it imperative to try all available solutions to overapplication.

In an effort to understand the pros and cons of the new system, the APDR leadership team consulted with the leaders in the dermatology PD community. The preliminary data from the dermatology PD surveys suggest that the majority of PDs found the supplemental application valuable for holistic review and are in favor of continuing with signaling in the future (I. Rosman, MD, University of Washington, personal communication, 2021). We were further encouraged by the ERAS team response to the participating pilot program's feedback, namely the expected integration of the main and supplemental applications into one system and expansion of the number of users on the program side. This should make the process significantly more efficient and user-friendly.

Because of the close relationship between diagnostic radiology (DR) and interventional radiology (IR)

training—their location in the same departments and the variety of pathways for IR training for DR residents—the APDR and the Association of Program Directors in Interventional Radiology (APDIR) leadership accepted the ERAS offer of joint participation in the supplemental application. The ERAS team recommended that the two specialties use a single set of signals because the overwhelming majority of IR applicants also apply to DR programs.

As to the number of signals, any decision must balance the value of signals to all stakeholders. The fewer the signals, the more valuable they are to the programs. However, the data from the otolaryngology 2021 match [5] supported by the preliminary data from the most recent ERAS pilot (J. Bograd, AAMC, personal communication, 2022) show that a minority of programs receive a disproportionate number of signals, with the rest receiving much fewer. If the number of signals is too small for medical students to have a mix of reach and safety choices, smaller programs and institutions outside major metropolitan areas may not see the benefit of signaling. At the same time, if the number of signals is too high, large university programs and programs in large metropolitan areas may see little benefit in the system. Furthermore, the more signals received, the less impetus for programs to consider applications from and grant interviews to applicants who did not signal them. Another issue under discussion is whether medical students should signal programs affiliated with their medical school (eg, home program) or programs in which they did outside rotations. Debate is ongoing to ensure that the new system is equitable and of greatest benefit to students and programs alike.

The success of signaling will be evidenced by radiology PDs

interviewing more applicants who would otherwise be overlooked and medical students receiving more invitations to interview for programs of their choice. In the longer term, we hope to see lower costs to all stakeholders, with medical students approaching fewer programs, program directors having more time for in-depth review of student applications, and the match experiencing fewer market failures—unfilled residency positions and unmatched, qualified applicants.

SUMMARY

In summary, signaling is used successfully in the interview market for PhDs in economics and the otolaryngology match. The data from the ongoing ERAS pilot for internal medicine, surgery, and dermatology is also encouraging. DR and IR are joining the pilot in the upcoming ERAS season. As long as radiology PDs remember that lack of a signal does not mean lack of interest and applying medical students are educated to apply to a mix of reach and safety programs, we are confident that the entire radiology community will find signaling valuable.

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