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Authors
Naaseh, Ariana
de Virgilio, Christian
Nahmias, Jeffry

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General Surgery Residency Match: Time for More than a Virtual Change

Ariana Naaseh, BA, * *Christian de Virgilio, MD,* † *and Jeffry Nahmias, MD, MHPE* *

*University of California, Irvine, Department of Surgery, Orange, California; and †Harbor-UCLA Medical Center, Department of Surgery, Torrance, California

The 2020-2021 General Surgery Residency Match presents unique challenges in the setting of the COVID-19 pandemic and highlights pre-existing concerns. In order to move toward an equitable and manageable surgical residency application process for both programs and applicants, systemic change is warranted. (J Surg Ed 78:1771−1775. © 2021 The Author(s). Published by Elsevier Inc. on behalf of Association of Program Directors in Surgery. This is an open access article under the CC BY license (http://creativecommons.org/licenses/by/4.0/))

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COMPETENCIES: Professionalism, Interpersonal and Communication Skills, Systems-Based Practice

Since 1995, the Electronic Residency Application Service (ERAS) has been utilized by medical students to secure general surgery (GS) residency positions. Alarmingly, there has been a rise in the number of applications per student, from 37.6 in 2016 to 47.0 in 2020.[1] This 27% increase in applications is disproportionate to the rise in unmatched applicants, which has grown from 15.9% in 2018 to 16.8% in 2020.[2] Understandably, applying broadly is driven by fear of not matching.[3]

The rising number of applicants adds stress to residency selection committees as well, fostering arbitrary cut-points for application review, often based on United States Medical Licensing Examination (USMLE) scores, rather than a holistic approach.[1] In fact, the 2020 National Resident Matching Program (NRMP) Program Director (PD) survey[2] (only 16% response rate) reported that 56% rejected applications using a standardized screening process, with only 37% of applications receiving in-depth initial review.[4] Furthermore, 90% of programs utilized USMLE Step 1 as an initial screening tool. Though Step 1 has become pass/fail, this will likely shift emphasis to Step 2, an applicant's medical school, clerkships, and acceptance into Alpha Omega Alpha (AOA) and/or Gold Humanism Honor Society (GHHS).[5,6]

APPLICATION CAPS

AAMC data indicates at a certain point, applying to more programs does not increase one's chances of matching.[7] Application and interview caps are emerging as strategies to combat increasing applications. This cycle, Emergency Medicine (EM) released a consensus statement for applicants to pursue a maximum of 17 interviews.[8] However, caps have largely been denounced by applicants given the individuality of each candidate's application. In particular, caps may disadvantage Couples Match participants, less competitive U.S. applicants, and Osteopathic/International graduates. Furthermore, this solution places a disproportionate emphasis on applicants to solve the Match conundrum. Additionally, for applicants who are less likely to receive interviews, an interview cap would only benefit them if programs simultaneously increased the number of interviews, according to a modeling study.[9] Thus, any conversation regarding interview/application caps should be coupled with increasing interviews offered by programs. In addition, application caps cannot succeed without transparency of information to help applicants assess their likelihood of matching at each program.[10]

Two-tiered application periods such as an Early Result Acceptance Program have been suggested.[11-13] A Radiology PD survey indicated they would consider an "early action" period where applicants apply to a small number of programs, followed by a normal application period. This would enable programs to initially engage fewer, highly interested students.[14] Prior to implementation, GS PDs should be queried regarding interest in an "early action" period.

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Correspondence: Inquiries to Jeffry Nahmias, MD, MHPE, University of California, Irvine Medical Center, 333 City Blvd West, Suite 1600, Orange, CA 92868, Phone: (714) 456-5890; Fax number: 714-456-6048; e-mail: jnahmias@hs.uci.edu

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APPLICANT INTEREST

PDs prefer interviewing applicants with genuine interest in their residency. In fact, 60% of PDs rate an applicant's interest in their program as an important factor for selection of interviewees.[4] In further support, computational modeling shows that providing applicants the opportunity to declare program preferences improves the number of interview invitations.[15] This cycle, Otolaryngology is piloting a five-program preference signaling system that enables applicants to "signal" interest to programs.[16] However, this one-way signaling may have unintended consequences if applicants send signals to "reach programs", thereby only signaling the most prestigious residencies, or if more competitive applicants signal "safety programs" and draw interest away from less competitive candidates who may have otherwise received interview offers.[17] Carmody et al. proposed a 100-point weighted point system to declare interest in programs rather than merely signaling a small number of potentially "reach" programs.[10] Further evaluation of the full effects of this process prior to consideration for the GS Match appears warranted.

LETTERS OF RECOMMENDATION (LOR), MEDICAL STUDENT PERFORMANCE EVALUATION (MSPE), AND APPLICANT TRAITS

The 2020 NRMP Survey of GS PDs identified several traits as important for an applicant's success including professionalism, leadership, and communication skills. Presently, these characteristics are evaluated via LORs and MSPEs. However, surgery LORs are not standardized, and only 60% of surgery PDs surveyed viewed MSPEs favorably.[4]

Concerns have been raised regarding the true objectivity and inter-reader reliability of LORs and MSPEs as LOR writers and medical schools are tasked with a challenging conflict of promoting their students while rendering objective opinions.[18] Additionally, studies have demonstrated racial, ethnic, and gender implicit biases in portrayal of students in MSPEs.[19-20]

In 2017, the AAMC convened an MSPE task force to standardize and increase transparency of student evaluations.[22] Areas of concern with the MSPE included grade inflation, with a large variation (7-67%) of students awarded top grades (e.g. honors) in surgery clerkships.[23] The AAMC did not address implicit and systemic biases in clerkship grading, which will require specialty-wide efforts to eliminate.

Specialties such as EM, Plastic Surgery, Otolaryngology, and Orthopedics have successfully implemented a standardized LOR (SLOR) that includes tiered internal ranking of applicants, which may be inflated in the top tier.[21] We propose focused study to discern whether current LORs serve GS PDs well and what characteristics (e.g. personality traits, work ethic) are most useful to evaluate GS applicants, as it is unclear from prior research.[24]

AOA, GHHS AND OTHER MEMBERSHIPS

Membership in AOA and GHHS is currently included in ERAS applications. In fact, 52% and 40% of surgery PDs cited AOA and GHHS respectively as important interview selection factors.[4] Use of these honor society memberships for residency selection is problematic for several reasons. First, the selection process for both is minimally standardized across institutions.[25] Second, racial disparities have been demonstrated for AOA selection resulting in less Black and Asian students being selected.[26-28] Finally, not all medical schools have AOA or GHHS chapters.[29]

In order to combat these inequities, we propose that election into honor societies be delayed until graduation while institutions re-evaluate fair and equitable selection processes. This would still allow recognition of achievements, while eliminating inclusion in ERAS applications.

THE PROCESS OF INTERVIEW INVITATION/ ACCEPTANCE IS FLAWED

In the 2020 NRMP survey, 30% of GS PDs reported offering more interview invitations than interview slots available.[4] Furthermore, 65% of interviews were scheduled in the order in which applicants responded.[4] Students have reported missing interview offers if they didn't reply within minutes. In fact, some students avoid scheduling clinical rotations during interview season. With interview season spanning months, this creates a lost opportunity for valuable student education.

One potential solution is an interview universal release date. During that day, all invitations are released, but applicants are allowed a week before they can schedule interviews. This would permit applicants to thoroughly evaluate all offers and promote more judicious acceptance of interviews by highly competitive applicants, while alleviating anxiety of missing interview opportunities.

A recent Obstetrics and Gynecology grant through the American Medical Association has created the "Right Resident, Right Program, Ready Day One" program.[30] This program prohibits offering more interview slots than available, allows students a minimum of 72-hours to respond to interview invitations, and

informs all applicants of final status on a predetermined date. While this may be challenging to implement, with advanced notice of release date(s) GS could develop a similar initiative. Regardless, the practice of programs offering more interview spots than available should be prohibited.

VIRTUAL INTERVIEWS: NEW CONSIDERATIONS

The COVID-19 pandemic shifted interviews to a virtual platform, highlighting important pre-existing flaws and introducing new considerations. In 2019, U.S. matched GS applicants were offered an average of 18 interviews and attended 14. In prior cycles, up to 41% of residency applicants cancelled interviews secondary to financial or scheduling reasons.[31] Preliminary data demonstrate a decrease in applicant interview cancellations in the 2020-2021 Match[32] despite the Association of PDs in Surgery encouraging applicants to cancel extra interviews.[33] This decrease in cancellations creates the potential for highly competitive applicants to hold the majority of residency interview spots. The NRMP has demonstrated that for GS applicants to have a 90% chance of matching they should rank 11 programs.[2] A universal release date, combined with other reform efforts, may help applicants optimize a successful match.

In addition to reducing cancellations, virtual interviewing can save applicants a significant amount of money as 64% of applicants spent over $2500 and 13% over $7500.[14] Virtual interviewing also saves significant travel time. However, applicants and programs speculate it may be harder to find a "true fit" without interpersonal interactions and the ability to see available living situations. It also makes it more difficult for residency programs to assess applicant interest without this classic investment of time and money. In the future, perhaps a hybrid model can be created, with screening virtual interviews of a larger initial applicant pool, followed by in-person interviews for a smaller subset.

A CALL TO ACTION

In summary, several recommendations should be considered, including delaying honor society memberships until graduation, adoption of a universal interview release date, and retooling of the LOR and MSPE. Conducting a large national survey of PDs and applicants with a high response rate may help produce concrete data to guide reform. This should include questions regarding an early action period, the development of new instruments to measure important traits that lead to success in GS residency, and the creation of a hybrid virtual/in-person interview model. Ultimately, the goal is to achieve a fair and evidence-based approach to resident selection.

REFERENCES

1. American association of medical colleges electronic residency application system historical specialty specific data: general surgery [database online]. Available at: https://www.aamc.org/data-reports/students-residents/report/eras-statistics; 2020. Accessed January 24, 2021.
2. National Resident Matching Program. Charting Outcomes in the Match: Senior Students of U.S. MD Medial Schools 2020.Washington, DC: National Resident Matching Program; 2020. Available at: https://mk0nrmp3oyqui6wqfm.kinstacdn.com/wp-content/uploads/2020/07/Charting-Outcomes-in-the-Match-2020_MD-Senior_final.pdf. Accessed January 24, 2021.
3. Aagaard EM, Abaza M. The residency application process — burden and consequences. *N Engl J Med*. 2016. https://doi.org/10.1056/nejmp1510394.
4. National Resident Matching Program. Data Release and Research Committee: Results of the 2020 NRMP Program Director Survey.Washington, DC: National Resident Matching Program; 2020. Available at: https://mk0nrmp3oyqui6wqfm.kinstacdn.com/wp-content/uploads/2020/08/2020-PD-Survey.pdf. Accessed January 24, 2021.
5. Neville AL, Smith BR, De Virgilio C. USMLE Step 1 scoring system change to pass/fail-an opportunity for change. *JAMA Surg*. 2020. https://doi.org/10.1001/jamasurg.2020.2836.
6. Makhoul AT, Pontell ME, Ganesh Kumar N, Drolet BC. Objective measures needed — program directors' perspectives on a pass/fail USMLE step 1. *N Engl J Med*. 2020. https://doi.org/10.1056/nejmp2006148.
7. Apply smart: data to consider when applying to residency [American Association of Medical Colleges Website]. Available at: https://students-residents.aamc.org/applying-residency/filteredresult/apply-smart-data-consider-when-applying-residency/. Accessed January 24, 2021.
8. Consensus Statement on the 2020-2021 Residency Application Process for US Medical Students Planning Careers in Emergency Medicine in the Main Residency Match [Emergency Medicine Residents' Association]. Available at: https://www.emra.org/be-involved/be-an-

advocate/working-for-you/residency-application-process/. Accessed January 24, 2021.

9. Morgan HK, Winkel AF, Standiford T, et al. The case for capping residency interviews. *J Surg Educ*. 2020. https://doi.org/10.1016/j.jsurg.2020.08.033.

10. Carmody JB, Rosman IS, Carlson JC. Application fever: reviewing the causes, costs, and cures for residency application inflation. *Cureus*. 2021. https://doi.org/10.7759/cureus.13804.

11. Monir JG. Reforming the match: a proposal for a new 3-phase system. *J Grad Med Educ*. 2020. https://doi.org/10.4300/JGME-D-19-00425.1.

12. Hammoud MM, Andrews J, Skochelak SE. Improving the residency application and selection process: an optional early result acceptance program. *JAMA - J Am Med Assoc*. 2020. https://doi.org/10.1001/jama.2019.21212.

13. Wong BJF. Reforming the match process - Early decision plans and the case for a consortia match. *JAMA Otolaryngol - Head Neck Surg*. 2016. https://doi.org/10.1001/jamaoto.2016.1232.

14. Rozenshtein A, Griffith BD, Ruchman RB. Residency match during the COVID-19 pandemic: the clear and present danger of the remote interview. *J Am Coll Radiol*. 2020. https://doi.org/10.1016/j.jacr.2020.10.005.

15. Whipple ME, Law AB, Bly RA. A computer simulation model to analyze the application process for competitive residency programs. *J Grad Med Educ*. 2019. https://doi.org/10.4300/JGME-D-18-00397.1.

16. Salehi PP, Benito D, Michaelides E. A novel approach to the national resident matching program—the star system. *JAMA Otolaryngol - Head Neck Surg*. 2018. https://doi.org/10.1001/jamaoto.2018.0068.

17. Gangal A, Blalock TW. A perfect match: pros and cons of preference signaling in dermatology. *J Am Acad Dermatol*. 2020. https://doi.org/10.1016/j.jaad.2020.12.050.

18. Rajesh A, Rivera M, Asaad M, et al. What Are We REALLY looking for in a letter of recommendation? *J Surg Educ*. 2019. https://doi.org/10.1016/j.jsurg.2019.06.008.

19. Polanco-Santana JC, Storino A, Souza-Mota L, Gangadharan SP, Kent TS. Ethnic/Racial bias in medical school performance evaluation of general surgery residency applicants. *J Surg Educ*. 2021. https://doi.org/10.1016/j.jsurg.2021.02.005.

20. Ross DA, Boatright D, Nunez-Smith M, Jordan A, Chekroud A, Moore EZ. Differences in words used to describe racial and gender groups in Medical Student Performance Evaluations. *PLoS One*. 2017. https://doi.org/10.1371/journal.pone.0181659.

21. Joshi ART, Vargo D, Mathis A, Love JN, Dhir T, Termuhlen PM. Surgical residency recruitment-opportunities for improvement. *J Surg Educ*. 2016;73:e104–e110. https://doi.org/10.1016/j.jsurg.2016.09.005. PMID: 27886970.

22. Recommendations for revising the Medical Student Performance Evaluation (MSPE) [The Association of American Medical Colleges]. Available at: https://www.aamc.org/system/files/c/2/470400-mspe-recommendations.pdf; 2017. Accessed April 17, 2021.

23. Alexander EK, Osman NY, Walling JL, Mitchell VG. Variation and imprecision of clerkship grading in U.S. medical schools. *Acad Med*. 2012. https://doi.org/10.1097/ACM.0b013e31825d0a2a.

24. Hayek SA, Wickizer AP, Lane SM, et al. Application factors may not be predictors of success among general surgery residents as measured by ACGME milestones. *J Surg Res*. 2020. https://doi.org/10.1016/j.jss.2020.03.029.

25. How Members Are Chosen [Alpha Omega Alpha]. Available at: https://alphaomegaalpha.org/how.html#gsc.tab=0;2020. Accessed January 24, 2021.

26. Boatright D, Ross D, O'Connor P, Moore E, Nunez-Smith M. Racial disparities in medical student membership in the alpha omega alpha honor society. *JAMA Intern Med*. 2017. https://doi.org/10.1001/jamainternmed.2016.9623.

27. Wijesekera TP, Kim M, Moore EZ, Sorenson O, Ross DA. All other things being equal: exploring racial and gender disparities in medical school honor society induction. *Acad Med*. 2019. https://doi.org/10.1097/ACM.0000000000002463.

28. Lynch G, Holloway T, Muller D, Palermo A-G. Suspending student selections to alpha omega alpha honor medical society. *Acad Med*. 2020. https://doi.org/10.1097/acm.0000000000003087.

29. Rosenthal S, Howard B, Schlussel YR, et al. Does medical student membership in the gold humanism honor society influence selection for residency? *J Surg Educ*. 2009. https://doi.org/10.1016/j.jsurg.2009.08.002.

30. The Match process is packed with stress. Ob-gyns aim to fix it [Brendan Murphy, American Medical Association]. Available at: https://www.ama-assn.org/

education/improve-gme/match-process-packed-stress-ob-gyns-aim-fix-it; 2019. Accessed April 17, 2021.

31. Fogel HA, Liskutin TE, Wu K, Nystrom L, Martin B, Schiff A. The economic burden of residency interviews on applicants. *Iowa Orthop J*. 2018;38:9–15.

32. 2020 Residency Recruitment Crisis? Data says, Not so much [Thalamus Graduate Medical Education website]. Available at: https://thalamusgme.com/2020-residency-recruitment-crisis/; 2020. Accessed January 24, 2021.

33. Association of Program Directors in Surgery (APDS) Position Statement 2020-2021 Mid-Application Cycle Recommendations. Available at: https://apds.org/wp-content/uploads/2021/01/APDS-Statement-Mid-Application-Cycle-2020-2021_Final_pdf; 2020. Accessed April 17, 2021.