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COVID-19 and the Ophthalmology Match

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The coronavirus disease 2019 (COVID-19) pandemic has impacted ophthalmology and medical education profoundly. In an effort to reduce the transmission of severe acute respiratory syndrome coronavirus 2, the American Academy of Ophthalmology issued a statement on March 18, 2020, urging all ophthalmologists immediately to cease providing any treatment other than urgent or emergent care.¹ This recommendation—endorsed by every major ophthalmology organization in the United States—resulted in a 79% reduction in care, the highest decline of any medical or surgical discipline.² Concurrently, the Association of American Medical Colleges recommended that medical schools pause all medical student clinical rotations and suggested that medical students not be involved in any direct patient care.³ The disruption was unprecedented. Medical students were unable to complete core clerkships and specialty electives at a critical time in their training. Imposed travel restrictions limited their ability to pursue rotations away from their home institutions (“away rotations”), global health experiences, and academic meetings. Social distancing requirements interrupted research activities and prevented some medical students from completing the United States Medical Licensing Examinations (USMLEs).

The dramatic reduction of activities within ophthalmology departments, coupled with the inability of medical students to engage in patient care, research, education, and outreach, have important implications for the 2020–2021 ophthalmology match. Several studies have explored applicant and residency program characteristics that contribute to a successful match.^{4–6} These factors include: high USMLE scores, Alpha Omega Alpha membership, the presence of an ophthalmology residency program in the student’s home school, and the availability of ophthalmology electives. Other important considerations include honors or equivalent grades in core clinical clerkships, an outstanding medical student performance evaluation, and supportive letters of recommendation from ophthalmology faculty. Although some medical students may have had the opportunity to fulfill these expectations before the COVID-19 pandemic began, others may have gaps—especially students from areas of the country hardest hit by the pandemic or those who decided to pursue ophthalmology later in their medical education.

Recommendations on how applicants and residency programs can overcome match-related challenges associated with the COVID-19 pandemic have been proposed.^{7–9}

Many of these suggestions are aligned with the Coalition for Physician Accountability’s Work Group report released on May 11, 2020.¹⁰ The Coalition for Physician Accountability’s Work Group is a cross-organizational group comprising of the leading organizations in medical education. In response to the COVID-19 pandemic, the Coalition for Physician Accountability’s Work Group issued a series of recommendations to promote consistency and fairness for all residency program applicants. Their 4 recommendations focus on discouraging away rotations with limited exceptions; committing to online interviews and virtual visits for all applicants; delaying the opening of the residency application process and release of the medical student performance evaluation; and committing to transparency and enhanced communication among all stakeholders.

The Association of University Professors of Ophthalmology (AUPO) has developed the following recommendations to mitigate the impact of the COVID-19 pandemic for the 2020–2021 ophthalmology match cycle. Our intention is to ensure a successful residency application process by focusing on 4 guiding principles: safety, equity, fairness, and transparency.

Match Timeline

The AUPO acted quickly to extend the application deadline and to delay the rank list submission date by approximately 1 month. To reduce any perceived pressure on applicants to submit their application materials early, the AUPO directed that no applications would be visible to programs until September 1, 2020. The earliest date programs could begin to offer interview invitations was standardized to October 12, 2020.

Virtual Interviews

In an effort to promote safety and to ensure that medical students and residency programs from the most severely impacted regions are not disadvantaged by their inability to attend or host in-person interviews, all ophthalmology residency programs will conduct online rather than in-person interviews. This applies to all applicants, including local students. We realize this action will have a significant effect on the ophthalmology match experience. The opportunities to interview with faculty face to face and to observe

resident–faculty interactions are among the most important factors applicants use to develop their rank lists.^{11,12} Residency programs will need to develop creative ways to convey the intangible workplace environment characteristics that make each program special. Although the vast majority of applicants and faculty strongly prefer in-person interviews, online interviews do offer substantial cost savings and decreased travel-related stress for applicants.¹³

Centralized Scheduling of Interviews

All ophthalmology residency programs will use the new Interview Scheduler program from SF Match to post interview dates and times and to schedule applicants for interviews. The use of a centralized interview scheduling program is intended to expand the interviewee pool and to reduce last-minute cancellations by limiting the ability of applicants to hold more than 1 interview invitation for the same day. For the 2020–2021 application cycle only, applicants will have the ability to schedule a maximum of 2 online interviews per day (e.g., morning and afternoon), provided the interview sessions do not conflict.

Cap on Number of Online Interviews

A 1-time maximum cap of 20 online interviews will apply for each applicant. We do not anticipate this cap will affect highly competitive applicants adversely based on historic in-person interview data. In a 2018 study by Siatkowski et al¹⁴ on the probability of success in the ophthalmology match, 3-year outcomes data revealed that the mean number of interview invitations was 9.29, with a standard deviation of 6.3. The number of interview invitations ranged from 0 to 29, with a median of 9. The number of invitations at the 75th percentile was 14. Historically, applicants who rank more than 10 programs have a more than 90% ophthalmology match success rate.⁴

Accessible and Accurate Program Information

Applicants actively search for information to help them determine where to apply for residency training, as well as which programs to visit and rank. Those who attend a medical school without an ophthalmology department often face difficulties in finding an advisor who is familiar with the profession or the match process. Students often use nonstandard online resources that may or may not provide accurate information. Blogs and chat rooms often express individual experiences and contain personal impressions rather than program-specific data. Although ophthalmology rankings may seem to be a useful way to differentiate programs, applicants should be cautious when interpreting the results because rankings are based solely on reputation and do not use statistically valid sampling or outcomes measures.¹⁵

In an effort to provide applicants easy access to accurate program information, the AUPO has initiated a project to

collect and publish core ophthalmology residency program data in a standardized fashion. The 12 data points proposed by the Match Oversight Committee and approved by the Board of Trustees are listed in Table 1. For the first time, a uniform and accurate database for each program participating in the ophthalmology match will be available for applicants on a single website. Additional resources for applicants are available on the AUPO website (<https://aupo.org/programs-services/medical-students>).

Discouragement of In-Person Away Rotations

Given ongoing concerns related to travel and the fact that many applicants and residency programs are unable to attend or host away rotations, in-person away rotations are discouraged except for those applicants who do not have access to a clinical experience with an ophthalmology residency program in their home health system. Within certain specialties, away rotations may have a significant influence on where applicants rank and ultimately match.¹⁶ The importance of away rotations in ophthalmology is unclear given that so-called audition rotations generally are discouraged and that available data on away rotations are limited. In a 2016 study, Winterton et al¹⁷ reported that of the 37 survey respondents from ophthalmology, 73% completed a mean number of 1.9 away rotations; 32% of these respondents matched at their home institution or the program where they completed their away rotation. Of course, no guarantee exists that students on away rotations will be issued an interview invitation; high numbers of visiting students actually may increase the competition for interview slots.

Reimagining the Resident Selection Process

The AUPO encourages all residency programs to re-evaluate how they screen and rank applicants. Given the impact of the COVID-19 pandemic, residency programs may be unable to rely on traditional methods. For example, grading of core clinical clerkships may be limited to pass-or-fail assessments with no opportunity for applicants to distinguish themselves with honors; the

Table 1. Ophthalmology Residency Program Data Points

1. Accreditation status
2. Type of internship
3. Association with a Veterans Administration medical center
4. Association with a medical school
5. Number of approved residents/year
6. Number of fellow slots/year in each subspecialty
7. Number of full-time, part-time, and volunteer faculty in comprehensive ophthalmology and each subspecialty
8. Number of full-time basic scientists
9. Mean cataract volume as primary surgeon per graduating resident/last 4 years
10. Mean non-cataract surgical volume as primary surgeon per graduating resident/last 4 years (programs may pick any 3 procedures of their choice)
11. Percentage of residents entering fellowship/last 4 years
12. Percentage of residents entering private practice/last 4 years.

medical student performance evaluation release date has been delayed to at least October 21, 2020, more than 1 month after our application deadline; applicants may have encountered obstacles related to COVID-19 in their pursuit of research and service. In light of these factors, residency programs may be tempted to place even greater emphasis on specific metrics like USMLE scores. It is important to acknowledge that USMLE scores do not necessarily predict future resident success.¹⁸ A recent presentation at the annual AUPO meeting showed no correlation between USMLE step 1 scores and resident performance (Gudgel B, et al. Predictors of a successful ophthalmology resident. Poster presented at: AUPO Annual Meeting; January 29, 2020; Rancho Mirage, CA). Furthermore, the reliance on USMLE scores disadvantages underrepresented in medicine applicants.¹⁹ Given our imperative to increase diversity in the field of ophthalmology, we need to use screening and ranking methods that ensure the holistic and equitable review of all applicants.

The AUPO is committed to working together with applicants and the academic ophthalmology community to

ensure a successful 2020–2021 ophthalmology match, despite the massive disruption caused by the COVID-19 pandemic. We believe the responses outlined within this document, although marking a significant departure from our traditional approach to the ophthalmology match, will help to ensure a safe, equitable, fair, and transparent residency application process for all stakeholders. Regular updates will be posted on the SF Match website, and major developments will be distributed electronically to applicants and AUPO members. The impact of the COVID-19 pandemic and these recommendations will be assessed through the SF Match survey and analysis of ophthalmology match participation and outcomes. The actions necessary to meet the challenges posed by the current crisis create a unique opportunity to effect changes that may benefit the match process for the long term.

Our responses to the COVID-19 pandemic are part of an ever-evolving process to serve the needs of our stakeholders and our society. The AUPO is fully committed to developing and supporting a profession that reflects the greatest integrity, diversity, and humanity.

Footnotes and Disclosures

Disclosure(s): All authors have completed and submitted the ICMJE disclosures form. The author(s) have no proprietary or commercial interest in any materials discussed in this article.

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References

1. American Academy of Ophthalmology. Recommendations for urgent and nonurgent patient care. Available at: <https://www.aaof.org/headline/new-recommendations-urgent-nonurgent-patient-care>. Accessed 10.06.20.
2. The Commonwealth Fund. The impact of the COVID-19 pandemic on outpatient visits. <https://www.commonwealthfund.org/publications/2020/apr/impact-covid-19-outpatient-visits>; 2020. Accessed 10.06.20.
3. Association of American Medical Colleges. Important guidelines for medical students on clinical rotations during the coronavirus (COVID-19) outbreak. <https://www.aamc.org/news-insights/press-releases/important-guidance-medical-students-clinical-rotations-during-coronavirus-covid-19-outbreak>; 2020. Accessed 10.06.20.
4. Yousuf SJ, Jones LS. Ophthalmology residency match outcomes for 2011. *Ophthalmology*. 2012;119:642–646.
5. Loh AR, Joseph D, Keenan JD, et al. Predictors of matching in an ophthalmology residency program. *Ophthalmology*. 2013;120:865–870.
6. Yamane MLM, Kassotis AS, DeMoraes CG, et al. Correlating ophthalmology exposure in medical school to applying and matching into an ophthalmology residency. *Acad Med*. 2020; 2020 Apr 21. <https://doi.org/10.1097/ACM.00000000000003448>. Online ahead of print.
7. Hammoud MM, Standiford T, Carmody JB. Potential implications of COVID-19 for the 2020–2021 residency application cycle. *JAMA*. 2020;324:29–30.
8. Gabrielson AT, Kohn JR, Sparks HT, et al. Proposed changes to the 2021 residency application process in the wake of COVID-19. *Acad Med*. 2020 May 26;10.1097/ACM.00000000000003520. <https://doi.org/10.1097/ACM.00000000000003520>. Online ahead of print.
9. Xie DX, Hillel AT, Ward BK. Otolaryngology residency match during the COVID-19 pandemic. What happens next? *JAMA Otolaryngol*. 2020; Jun 4. <https://doi.org/10.1001/jamaoto.2020.1078>. Online ahead of print.
10. Coalition for Physician Accountability. Final report and recommendations for medical education institutions of LCME-accredited, U.S. osteopathic, and non-U.S. medical school applicants. https://mk0nrmp30yqui6wqfm.kinstacdn.com/wp-content/uploads/2020/05/2020.05.06-Final-Recommendations_Final.pdf. Accessed 10.06.20.
11. Marasa LH, Pittman TA. Factors neurosurgery candidates use when choosing a residency program. *J Neurosurg*. 2014;120:167–172.
12. Yousuf SJ, Kwagyan J, Jones LS. Applicants choice of an ophthalmology residency program. *Ophthalmology*. 2013;120:423–427.
13. Vining CC, Eng OS, Hogg ME, et al. Virtual surgical fellowship recruitment during COVID-19 and its implications for the resident/fellow recruitment in the future. *Ann Surg Oncol*. 2020 May 18:1–5. <https://doi.org/10.1245/s10434-020-08623-2>. Online ahead of print.
14. Siatkowski RM, Mian SI, Culican SM, et al. Probability of success in the ophthalmology residency match: three-year

- outcomes analysis of San Francisco matching program data. *J Acad Ophthalmol.* 2018;10:e150–e157.
15. Quillen D. On ophthalmology rankings. *Ophthalmology.* 2019;126:1346–1349.
 16. Gabrielson AT, Kohn TP, Clifton MM. COVID-19 and the urology match: perspectives and a call to action. *J Urology.* 2020;204:17–19.
 17. Winterton M, Ahn J, Bernstein J. The prevalence and cost of medical student visiting rotations. *BMC Med Ed.* 2016;16(1):291.
 18. Lee AG, Golnik KC, Oetting TA, et al. Re-engineering the resident applicant selection process in ophthalmology: a literature review and recommendations for improvement. *Surv Ophthalmol.* 2008;53:164–176.
 19. Williams M, Kim EJ, Pappas K. The impact of United States Medical Licensing Exam (USMLE) step 1 cutoff scores on recruitment of underrepresented minorities in medicine: a retrospective cross-sectional study. *Health Sci Rep.* 2020;3:e2161.