Article published online: 2023-08-11

Telemedicine Training in Ophthalmology Residency Programs

Ryan S. Meshkin, MD[1] Kanza Aziz, MD[2] Marguerite C. Weinert, MD[1] Alice C. Lorch, MD, MPH[1,*] Grayson W. Armstrong, MD, MPH[1,*]

[1] Department of Ophthalmology, Massachusetts Eye and Ear, Harvard Medical School, Boston, Massachusetts
[2] Department of Ophthalmology, Wilmer Eye Institute, Johns Hopkins University School of Medicine, Baltimore, Maryland

J Acad Ophthalmol 2023;15:e172–e174.

Prior to the coronavirus pandemic, surgical specialties utilized telemedicine sparingly. One study cites prepandemic rates of surgical telehealth use to be less than 1% of new patient encounters,[1] while another study found fewer than 2% of clinicians provided any outpatient care via telemedicine.[2] Within the field of ophthalmology, telemedicine models were largely limited to screening and referral for diabetic retinopathy,[3] age-related macular degeneration,[4] and glaucoma.[5] With the onset of the coronavirus pandemic, however, telemedicine utilization for triage, diagnosis, and management of disease increased considerably. An astonishing 34% of new patient encounters across surgical specialties were conducted via telehealth at the height of the pandemic.[1]

Two significant questions have arisen in the wake of the early adoption of telemedicine: what is the staying power of telemedicine among surgical subspecialties, and are physicians appropriately trained to utilize telemedicine?

Telemedicine utilization declined in late 2020 with the resumption of in-person care, though the proportion of patient visits conducted via virtual means remained markedly higher than it had been prepandemic.[1,6] Notably, the proportion of care conducted via telemedicine appears to have stabilized in recent years.[6] Trends such as these suggest that telemedicine will likely continue to play a role in care delivery into the future.

Within the field of ophthalmology, similar initial increases and subsequent persistent utilization of telemedicine in the wake of the pandemic signal that telemedicine will likely continue to serve an important role in the years ahead.[7,8] Several specific advantages to the use of ophthalmic telemedicine have been identified including the provision of care to patients with limited access to tertiary eye care centers across state lines[9] and the screening of urgent ophthalmic conditions.[10–12] Continued innovation signals that ophthalmic telemedicine will likely play a role in future patient care.[4]

However, the preparedness of physicians to perform telemedicine is still an open question.[13–15] Telemedicine requires specific training due to the requisite array of skills needed that are distinct from in-person clinical care—identifying appropriate use cases for telemedicine, guiding patients through physical exams, establishing meaningful rapport in the virtual context, and performing clinical assessments reliably.[14,16–18] Until recently, studies describing telemedicine curricula targeted to the resident level are few and generally limited to nonsurgical fields such as family medicine, internal medicine, pediatrics, and neurology.[18–23]

In ophthalmology, formal telemedicine curricula have been developed that show positive impacts on resident perceived confidence and skill completing telemedicine eye exams.[24] Curricular components included instruction on navigating logistics of virtual telemedical platforms, gathering virtual eye exam metrics, and tips on diagnosing, managing, and triaging various acute and chronic eye diseases. Notably, 80% of the participating ophthalmology residents surveyed believed teleophthalmology will be an important aspect of their future ophthalmic practice.

Previously unpublished survey data of ophthalmology residency program directors (PDs), presented here for the first time, show that 56.3% (9 of 16 respondents) of those surveyed believe that telemedicine would be utilized in the future day-to-day practice of ophthalmologists. The Association of University Professors of Ophthalmology distributed an institutional review board-approved survey to all

* *Co-senior authors*

Address for correspondence Grayson W. Armstrong, MD, MPH, Massachusetts Eye and Ear, 243 Charles St, Boston, Massachusetts 02114 (e-mail: grayson_armstrong@meei.harvard.edu).

DOI https://doi.org/10.1055/s-0043-1772789.
ISSN 2475-4757.

Thieme Medical Publishers, Inc., 333 Seventh Avenue, 18th Floor, New York, NY 10001, USA

ophthalmology residency PDs in the United States, which was open to responses for a total of 2 weeks (March 29, 2021 to April 11, 2021). The majority of PDs had been in the role for 1 to 5 years ($n = 9$, 56.3%). While only 18.8% (3 of 16 respondents) of the PDs had implemented a telemedicine curriculum at the time of the survey, 50% indicated that they are planning to implement or augment their telemedicine curriculum. Curricular components for established programs included history-taking ($n = 3$), clinical examination ($n = 3$), documentation ($n = 3$), educational oversight ($n = 2$), and setup/logistics ($n = 2$). None taught ethics, professionalism, or health disparities as related to telemedicine. Four PDs (25%) had residents care for telemedical patients through direct patient care, while one of these programs additionally offered shadowing experiences. The majority of PDs felt that the best modalities to train residents in telemedicine were online seminars ($n = 12$) and practical experience seeing telemedical patients ($n = 12$). Perceived barriers to telemedical education included difficulty performing the ophthalmic clinical exam, technological limitations, limited curricular time and flexibility, and telemedical reimbursement concerns. While there was a low response rate (14.8%, 16 of 108 PDs), the results are telling of the perceived importance of telemedicine among those tasked with training future generations of ophthalmologists.

These findings may be reflective of similar views among PDs in other surgical fields, though data are lacking on current telemedical curricular offerings and perceptions of telemedicine's role in future day-to-day practice among surgical educators. Given the emerging centrality of telemedicine in various dimensions of clinical care, professional organizations, including the American Medical Association and the Association of American Medical Colleges, have begun to embed telehealth into core competencies for trainees.[25–28]

As the crisis response to the pandemic subsides and advances in telemedicine are projected to remain as central components of health systems, it becomes essential that educators reflect on ways to best prepare ophthalmology trainees to conduct telemedicine visits and foster effective surgeon-patient communication and connection in a telemedical age.

Conflict of Interest
None declared.

References

1 Chao GF, Li KY, Zhu Z, et al. Use of telehealth by surgical specialties during the COVID-19 pandemic. JAMA Surg 2021;156(07): 620–626
2 Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Variation in telemedicine use and outpatient care during the COVID-19 pandemic in the United States. Health Aff (Millwood) 2021;40(02):349–358
3 Avidor D, Loewenstein A, Waisbourd M, Nutman A. Cost-effectiveness of diabetic retinopathy screening programs using telemedicine: a systematic review. Cost Eff Resour Alloc 2020;18:16
4 Armstrong GW, Miller JB. Telemedicine for the diagnosis and management of age-related macular degeneration: a review. J Clin Med 2022;11(03):835
5 Gan K, Liu Y, Stagg B, Rathi S, Pasquale LR, Damji K. Telemedicine for glaucoma: guidelines and recommendations. Telemed J E Health 2020;26(04):551–555
6 Friedman AB, Gervasi S, Song H, et al. Telemedicine catches on: changes in the utilization of telemedicine services during the COVID-19 pandemic. Am J Manag Care 2022;28(01):e1–e6
7 Kalavar M, Hua HU, Sridhar J. Teleophthalmology: an essential tool in the era of the novel coronavirus 2019. Curr Opin Ophthalmol 2020;31(05):366–373
8 Sommer AC, Blumenthal EZ. Telemedicine in ophthalmology in view of the emerging COVID-19 outbreak. Graefes Arch Clin Exp Ophthalmol 2020;258(11):2341–2352
9 Aziz K, Moon JY, Devgan A, et al. In-state versus out-of-state ophthalmic telemedicine utilization during the COVID-19 pandemic. Invest Ophthalmol Vis Sci 2022;63(07):1407–A0103
10 Murchison A, Bilyk JR. Feasibility of Ophthalmic telemedicine Consultation in Urgent Settings (FOCUS). Invest Ophthalmol Vis Sci 2021;62(08):2673
11 Meshkin RS, Armstrong GW, Hall NE, Rossin EJ, Hymowitz MB, Lorch AC. Effectiveness of a telemedicine program for triage and diagnosis of emergent ophthalmic conditions. Eye (Lond) 2023;37 (02):325–331
12 Colon M, Henderer JD, Weiss S. Patient satisfaction with an ocular telehealth platform: a local experience after 1 year. Invest Ophthalmol Vis Sci 2022;63(07):1395–A0091
13 Almathami HKY, Win KT, Vlahu-Gjorgievska E. Barriers and facilitators that influence telemedicine-based, real-time, online consultation at patients' homes: systematic literature review. J Med Internet Res 2020;22(02):e16407
14 van Galen LS, Wang CJ, Nanayakkara PWB, Paranjape K, Kramer MHH, Car J. Telehealth requires expansion of physicians' communication competencies training. Med Teach 2019;41(06): 714–715
15 Moore MA, Coffman M, Jetty A, Klink K, Petterson S, Bazemore A. Family physicians report considerable interest in, but limited use of, telehealth services. J Am Board Fam Med 2017;30(03): 320–330
16 Mulcare M, Naik N, Greenwald P, et al. Advanced communication and examination skills in telemedicine: a structured simulation-based course for medical students. MedEdPORTAL 2020; 16:11047
17 Tuckson RV, Edmunds M, Hodgkins ML. Telehealth. N Engl J Med 2017;377(16):1585–1592
18 Ha E, Zwicky K, Yu G, Schechtman A. Developing a telemedicine curriculum for a family medicine residency. PRiMER Peer-Rev Rep Med Educ Res 2020;4:21
19 Savage DJ, Gutierrez O, Montané BE, et al. Implementing a telemedicine curriculum for internal medicine residents during a pandemic: the Cleveland Clinic experience. Postgrad Med J 2022;98(1161):487–491
20 Kirkland EB, DuBose-Morris R, Duckett A. Telehealth for the internal medicine resident: a 3-year longitudinal curriculum. J Telemed Telecare 2021;27(09):599–605
21 Costich M, Robbins-Milne L, Bracho-Sanchez E, Lane M, Friedman S. Design and implementation of an interactive, competency-based pilot pediatric telemedicine curriculum. Med Educ Online 2021;26(01):1911019
22 Afshari M, Witek NP, Galifianakis NB. Education research: an experiential outpatient teleneurology curriculum for residents. Neurology 2019;93(04):170–175
23 Edirippulige S, Armfield NR. Education and training to support the use of clinical telehealth: a review of the literature. J Telemed Telecare 2017;23(02):273–282
24 Aziz K, Sherif NA, Meshkin RS, Lorch AC, Armstrong GW. Telemedicine curriculum in an ophthalmology residency program. J Acad Ophthalmol 2022;14(01):e93–e102
25 Telehealth Competencies. https://www.aamc.org/data-reports/report/telehealth-competencies

26 AMA encourages telemedicine training for medical students, residents. American Medical Association. https://www.ama-assn.org/press-center/press-releases/ama-encourages-telemedicine-training-medical-students-residents
27 American Medical Association. Telemedicine in Medical Education. Report of the Council on Medical Education. 2016. Available at: https://www.ama-assn.org/system/files/2021-06/a16-cme-06.pdf. Accessed August 2, 2023.
28 Noronha C, Lo MC, Nikiforova T, et al; Society of General Internal Medicine (SGIM) Education Committee. Telehealth competencies in medical education: new frontiers in faculty development and learner assessments. J Gen Intern Med 2022;37(12):3168–3173

