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New Age Mentoring and Disruptive Innovation—Navigating the Uncharted With Vision, Purpose, and Equity

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For individuals aspiring to a career in otolaryngology–head and neck surgery, mentorship can shape destiny. Mentorship helps assure safe passage into the specialty, and it influences the arc of professional development across the career continuum. Even before the novel coronavirus disease 2019 (COVID-19) pandemic, technology and social networking were transforming mentorship in otolaryngology. Now, in an increasingly virtual world, where in-person interactions are the exception, mentorship plays an even more pivotal role. Mentors serve as trusted guides, helping learners navigate accelerating trends toward early specialization, competency-based assessments, and key milestones. However, several structural barriers render the playing field unlevel. For medical students, cancellation of visiting clerkships, in-person rotations, and other face-to-face interactions may limit access to mentors. The pandemic and virtual landscape particularly threaten the already-leaky pipeline for underrepresented medical students. These challenges may persist into residency and later career stages, where structural inequities continue to subtly influence opportunities and pairings of mentors and mentees. Hence, overreliance on serendipitous encounters can exacerbate disparities, even amid societal mandates for equity. The decision to take deliberate steps toward mentoring outreach and engagement has profound implications for what otolaryngology will look like in years to come. This article introduces the concept of new age mentoring, shining a light on how to modernize practices. The key shifts are from passive to active engagement; from amorphous to structured relationships; and from hierarchical dynamics to bidirectional mentoring. Success is predicated on intentional outreach and purposefulness in championing diversity, equity, and inclusion in the progressively technology-driven landscape.

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Supplemental content

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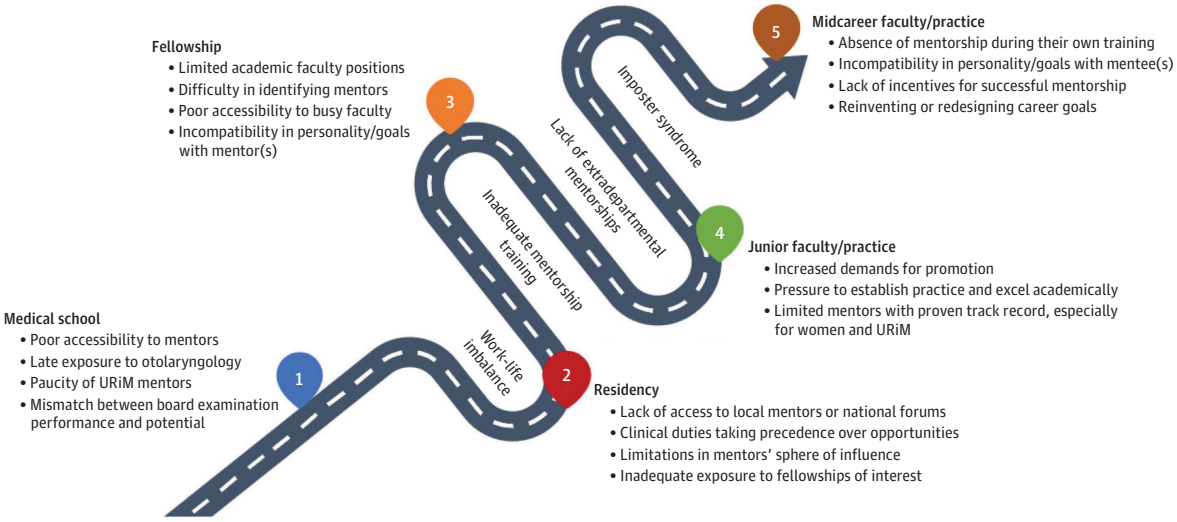
It is well established, though often not explicitly discussed, that mentorship plays a pivotal role in personal and professional achievement across the career continuum.[1] The success of otolaryngology–head and neck surgery (OHNS) in attracting medical students is predicated on connecting diverse learners with mentors and substantive experiences in patient care.[2] Unfortunately, such opportunities are often elusive, particularly for learners from underrepresented backgrounds or from medical schools without an otolaryngology-affiliated residency program.[3] Despite calls for increasing diversity of the otolaryngology workforce, the percentage of underrepresented minority applicants has not changed in the past 10 years.[4] Academic OHNS is not currently reflective of society, and this self-perpetuating lack of diversity is a structural barrier to delivering equitable, high-quality health care.

The accelerated adoption of virtual platforms in response to the novel coronavirus disease 2019 (COVID-19) pandemic presents both challenges and opportunities in mentoring. Amid cancellation of visiting clerkships and in-person rotations, students increasingly rely on virtual interactions to meet faculty and to learn about the specialty. The shift to virtual education has enriched some learners, while introducing new hurdles for others—particularly students who are first-generation college graduates or underrepresented in medicine. As a result, the global pandemic may threaten the already-leaky pipeline of mentorship for learners. At the same time, new possibilities have emerged, allowing access to mentors via virtual communities or through online conferences offered at a reduced cost to learners.

This article considers how mentoring has evolved over time, what new challenges have recently emerged, and how to implement effective structural solutions. Mentorship differs from coaching, which seeks to improve performance in specific domains; it should also be differentiated from sponsorship, which connects individuals to key persons and career opportunities. Coaching, mentoring, and sponsoring are synergistic in cultivating leaders, and we have chosen to focus on mentorship based on its central role in shepherding learners through critical career transitions as they navigate the uncharted. We emphasize how technology is transforming mentoring and how new age mentors maximize both effect and equity in mentorship. The approach contextualizes transformative change against the backdrop of the social reckoning in the wake of the murder of George Floyd. In this new mentoring paradigm, virtual learning communities, structured bidirectional mentorship, and a

Figure 1. Barriers to Mentorship Across the Career Continuum



The potential roadblocks to obtaining mentorship vary depending on career stage. Barriers are more persistent factors that tend to influence mentorship through all stages of a career. URiM Indicates underrepresented in medicine.

newfound emphasis on inclusivity are foundational elements for shaping the future of otolaryngology.

Evolution of the Mentoring Landscape

Well before the global pandemic, the need for major reform to medical student education and mentorship was evident. The Flexnerian paradigm of undergraduate medical education,[5] while transformative in its time, was over a century old and had overreliance on passive learning in rigid format. Newer innovations emphasized deeper engagement, such as flipped classrooms,[6] experiential learning,[7] and even reverse mentoring.[8] The COVID-19 pandemic has underscored the importance of addressing social determinants of health,[9] placing newfound emphasis on improving diversity,[10] mitigating health care disparities,[11] and achieving racial justice.[12]

Concomitant with this evolution, the Halstedian apprenticeship model, which emphasizes mastery through apprenticeship and progressive responsibility,[13] has increasingly incorporated structured milestones that are achieved through exposure to multiple, increasingly specialized faculty members.[14] As part of this evolution of the mentoring landscape, there has been growing recognition that mentorship can be widely variable in quality and effect. **Figure 1** outlines some common roadblocks through the career continuum. High-quality mentorship is associated with increased job satisfaction and decreased likelihood of being stalled in rank.[15] In contrast, low-quality mentorship is, by some metrics, similar to having no mentorship.[15] Quality mentorship is predicated on mentors' possessing competency in communication, understanding, professional development, diversity, and managing expectations.[16] Recent work has also highlighted the key roles of intentional outreach and structured virtual communities in promoting inclusivity in surgical fields.[17]

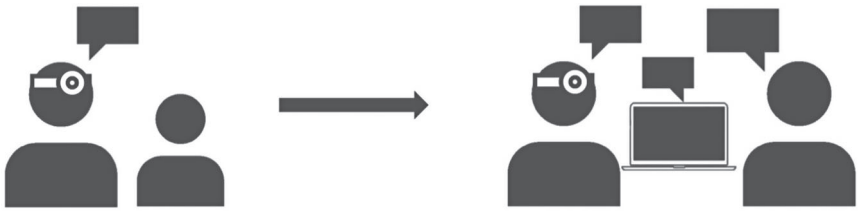
New Age Mentorship

New age mentorship embraces these changes. It actively incorporates technology and is characterized by a shift from passive to active, from unstructured to structured, and from top-down to near-peer and reverse mentorship (**Figure 2**). Interwoven into these layers is a deep and abiding commitment to inclusivity, supporting each mentee's vision in what they value and aspire to become.

Passive to Active

Traditional mentorship emphasizes unidirectional transmission of accumulated wisdom from mentor to mentee, with the mentee emulating admired behaviors and characteristics of the mentor. Although eventual autonomy can arise from such mirroring, "the eye cannot see what the mind does not know;" furthermore, the framework is liming because the mentor's finite experience of necessity defines the boundaries of learning. In the context of surgical education, simulation has assumed a growing role in promoting active learining[18]; nonetheless, medical students still spend most of their contact hours with faculty either passively assisting in the operating room or shadowing in the clinic, leaving many opportunities for active learning untapped. In surgery, active teachers engage the learner in decision-making, directly involve the learner in the procedure, and strive to capture teachable moments.[19] Active mentors are also deliberate in engaging mentees academically, inviting them to help craft research projects, to apply for grant funding, to write manuscripts, or to deliver presentations. Active mentors may also reach out to mentees to provide support during career transitions and stressful life events. Some mentors use rubrics[19] or forward-thinking mentoring approaches[20] to facilitate shared decision-making around mentoring goals and to promote collaborative effort in the relationship.

Figure 2. Evolution of the Mentorship Landscape



Traditional mentorship	Strategy	New-age mentorship
Passive	New-age mentoring is characterized by intentional outreach to students, ensuring opportunity for students who are underrepresented in medicine, first generation, or who lack home otolaryngology programs	Active
Unstructured	Unstructured approaches are evolving to formal arrangements that ensure access to faculty within institutions and in virtual communities	Structured
Generic	Mentorship is responsive to needs at the intersection of personal and professional goals, encouraging a mentor "board of directors"	Personalized
Following footsteps	Goals of new-age mentorship are guided by the mentee, who develops a clearer vision of their career path via questions posed by the mentor	Following mentee's vision
Unidirectional	Traditional apprenticeship models are giving way to more dynamic relationships that incorporate reverse and near-peer mentoring	Multidirectional
In-person	Traditional modalities of developing mentorship are evolving to include virtual communities, telementoring, and connection via social media	Incorporating technology

Unstructured to Structured

In traditional, unstructured mentorship contexts, learners must take the initiative in identifying a mentor, lobbying for meeting times, and ensuring continuity. Prolonged hiatuses are common, and scheduling is often erratic and based on perceived needs. There are also fewer protections to safeguard against mentorship malpractice, such as bottlenecking or misappropriation of ideas or efforts. Although unstructured mentorship may lead to more natural pairings, it all but ensures that some learners will fall through the cracks. Mentorship is part of the "hidden curriculum" of medical school, and though seldom acknowledged, unstructured models advantage those with preexisting networks, perpetuating structural inequities. This consideration is highly relevant to OHNS, a relatively small specialty that is culturally insular. Medical students lacking personal or family experience with mentorship in medicine may not know how to effectively approach and engage mentors.

Early, structured mentorship models that incorporate intentional outreach have a critical role in mitigating disparities.[17] Structured mentorship of preclinical students and mentored clerkships for underrepresented minority medical students can both increase interest in applying to the field and help overcome barriers to accessing mentors.[3,21] As mentoring practices have evolved, several aspects of mentorship have become more structured, allowing for mutual accountability and expectations for the mentor and mentee. Structured mentoring arrangements may dictate a minimum number of meetings per year and often have sessions dedicated to core topics or explicit agendas. Furthermore, if concerns about mentee performance arise, mentors may serve as a liaison between the department and learner.

Near-Peer and Reverse Mentorship

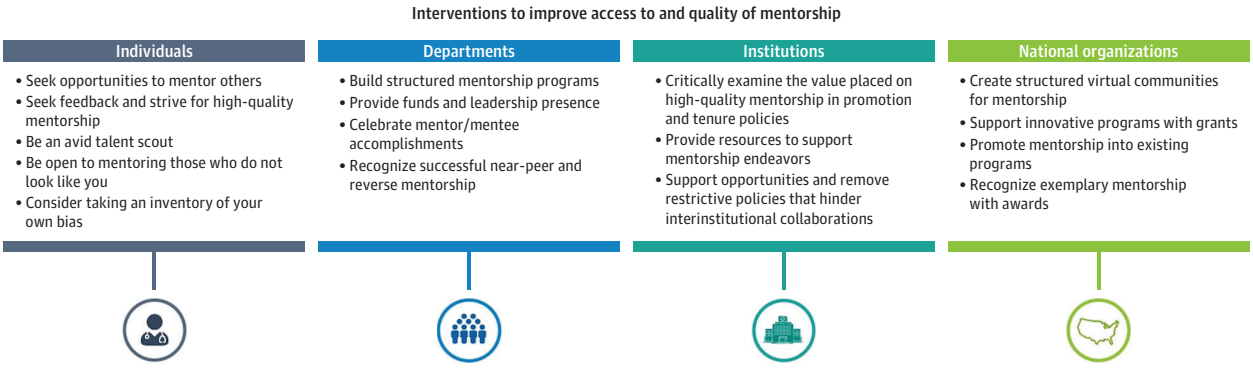
Academic medicine is notoriously hierarchical, but in recent years, there has been increasing recognition of the value that students and resident physicians can offer their mentors in the form of knowledge and perspectives.[22] Reverse mentorship promotes the development of both the mentor and the mentee. Increasingly tech-savvy learners bring both practical skills and modern perspectives that allow experienced specialists to become more versatile in clinical and social settings. The bidirectional exchange of knowledge during reverse mentoring fosters mutual respect and builds social capital. A more collaborative approach to mentor-mentee relationships allows trainees to be recognized for their expertise in particular areas as they continue to develop professional skills. Near-peer mentorship, as reflected in residents-as-teachers initiatives, cultivates young leaders while affording learners the perspective of someone who recently navigated a similar career stage. Furthermore, reverse and near-peer mentoring can help trainees of minority backgrounds to build community.[8,22-24]

Ensuring Inclusion in a Virtual Mentoring Landscape

As OHNS strives for greater inclusivity, mentors and mentees must be purposeful and open- minded in seeking out individuals with cultural identities different from their own[1] (**Figure 3**). Identity concordance is not a prerequisite for effective mentorship, and much can be learned from differences. At the same time, the need for greater cross-cultural competence in patient care is well documented,[25] and mentors of different backgrounds may not be able to provide nuanced guidance when matters of identity intersect with professional duties.

Mentees may benefit from guidance from faculty of a similar background at a different institution, or even outside of OHNS, when considering social identity in relation to professional development. Although mentoring at a distance has existed for many years, including telementoring to improve surgical skills,[26-28] virtual mentorship has greatly accelerated during the COVID-19 pandemic, and a variety of virtual otolaryngology experiences have emerged.[29-31] Efforts are needed to ensure that these opportunities are delivered equitably.[17,32]

Figure 3. Interventions to Improve Access to and Quality of Mentorship



Social media may also increase the opportunities for students to identify mentors. Female residents in surgical subspecialties are more likely to be mentored by the opposite gender, while desiring mentors of the same gender; however, social media helped residents to build same-gender mentorship.[33] Social media can also connect mentees with mentors across institutions, effectively building a "board of directors" panel of mentors, where each mentor on the board has a particular role or area of expertise. Social media has helped faculty and resident physicians offer mentorship to underrepresented minority (URM) students and to students at institutions lacking home residency programs.[34-37] Students have also used social media to connect with fellow applicants and share resources, a form of near-peer mentorship.[38] These efforts have been primarily led by individuals, and there is likely untapped potential in harnessing accounts for residency programs, departments, and national organizations to formally use social media to connect mentors and mentees.

Mentoring in Our Own Image, or Building the Future?

Historically, many mentors have fostered excellence by dutifully helping mentees to follow in their footsteps; in contrast, the new age mentor recognizes that the most fertile opportunities for growth are yet to be uncovered. Transformative progress only occurs by breaking new ground. A growing number of medical students and early career physicians are patenting medical technology, founding biotechnology companies, or leveraging data science or artificial intelligence.[39] Furthermore, machine learning is already being used to enhance surgical training and to advance the specialty.[40] As medical students and resident physicians increasingly offer technology and business intelligence, New Age Mentors seek to magnify their effect and reach, being open to innovative career possibilities.

When it comes to URM students, mentor training must go beyond the rudiments of cultural competence to consider barriers throughout the career continuum, many of which are unfamiliar to non-URM mentors. Each mentee will face a unique set of personal and professional challenges, and no single mentor can intuitively understand all of these nuances. Regardless of personal identity, all mentors must engage in the lifelong process of developing cultural humility.[41,42] Whereas cultural competence implies an achievable mastery of a finite body of knowledge, cultural humility rejects the notion of completion in favor of lifelong efforts at learning, addressing power differentials, raising awareness of social inequalities, and fostering mutual respect in mentor-mentee relationships.[43,44]

Rising to the Challenge

Digital technology maintains connection, but also introduces new challenges, particularly in the early, rapport building stages of mentorship. For example, virtual interactions obscure many of the critical, nuanced aspects of communication and relationship building that have evolved over human history.[45] For example, facial expression or vocal intonation may be blurred or lost when technology degrades visual or auditory aspects of the interaction. The natural chemistry achieved during in-person interactions may take longer to develop or not develop at all.

Varying degrees of digital literacy and access to technology (ie, internet connection speed, web camera, microphone/audio quality) may also introduce unconscious bias. The untoward effects of the digital divide are well-recognized in health care,[46,47] and what remains unknown is how these differences may effect opportunity for medical students applying to otolaryngology or at other key junctures. Learners in rural areas or those in a household with many other device users may have unreliable internet access. Students may also lack access to quiet areas for virtual meetings and interviews. To proactively mitigate unconscious bias introduced by these differences, medical schools and faculty may offer their students and mentees access to physical space and equipment as appropriate and available.

Beyond such challenges, developing a mentorship network in various career stages may prove challenging (Figure 1). As one progresses through successive career stages, new mentorship needs arise, and career stage-specific approaches are needed. New Age Mentoring overcomes barriers by widening and deepening the pool of mentors; improving access to mentors; and qualitatively and quantitatively enhancing the interactions and connections between mentors and mentees (eTable in the Supplement).

The mentor cannot anticipate the individualized needs of each mentee and must not impose their own vision for a successful career. The effective mentor elicits the mentee's personal vision, prioritizing activities that serve this vision and avoiding those that siphon energy. If goals are not clear, the mentor needs to ask clarifying ques-

tions that help the mentee engage in reflective practice. As a mentee advances through successive career stages, the vision will mature, and therefore goals must be continuously readdressed. Over time, increasing specificity is needed, which ensures a feeling of ownership and a growing sense of purpose for both the mentee and mentor.

Women and individuals from URM backgrounds face unique challenges and barriers in obtaining mentors.[48] Access to individuals with expertise in navigating these challenges is imperative. As our specialty works to diversify, so too must the pool of mentors. Emphasis on deep-level similarities in attitudes, values, beliefs, and personality can help bridge demographic differences. The rapid adoption of virtual platforms related to the COVID-19 pandemic has spurred experimentation in mentorship, with opportunities arising from social media networks via Black Women in Otolaryngology (@BlackWomenInOto), The Black Otolaryngologist Network (@BlackOtoNetwork), and virtual conferences held by the Harry Barnes Society. To ensure the success of these efforts well-beyond the COVID-19 pandemic, institutions and national organizations can incentivize and build similar spaces to allow mentors and mentees to connect across geographic boundaries.

To scale access to high-quality, inclusive mentorship, academic medicine must allocate resources to reflect the core value of mentoring. The drivers of burnout in clinical medicine are legion, ranging from the "work after work" associated with electronic health records to the pressure for greater productivity and efficiency in clinical, teaching, and research activities. In this setting, mentorship must be prioritized, including redesigned promotion and tenure processes. In addition, support is needed for continuing education to improve the quality of mentorship, including recognizing personal identity across mentor-mentee differences such as generation, race/ethnicity, gender, and geography. Amidst the pandemic and seismic shifts in the practice of medicine, mentorship cannot—must not—be sacrificed on the altar of efficiency; igniting passion in learners has never been more urgent. Institutions that value mentoring can be a fount of resilience and renewal,[49] and those that neglect it will languish.

Surgery is founded on the egalitarian ideal that, afforded with the opportunity, any individual can achieve mastery by a dint of hard work and appropriate education and experience.[50] Where the ideal falters, however, is in assuring a fair chance to all. In the virtual era, a playing field that was never level to start with risks becoming more so. Mentorship can be the great equalizer only if there is a collective will to make it so, as a mentorship opportunity never extended is much like the seed never planted.

Conclusions

Although many of the goals of mentorship are timeless, new age mentoring encompasses an active, structured, and inclusive approach. Mentoring with vision, purpose, and equity requires intentional outreach and service to the mentee's vision. We are all on different, but intertwined journeys of lifelong growth and discovery. Great progress can be made by individuals, and steadfast leadership matters deeply at the level of departments, institutions, and national societies. Our specialty is at the cusp of a metamorphosis—one that will impact its composition and its structure for years to come. How we, as mentors, rise to this defining moment, with its opportunities and inevitable inequities, will reveal much about who we are and what we stand for as a profession. As we embrace innovation in mentorship, we must also embrace humility. Our influence on the next generation will likely owe more to the bold questions we ask than to the knowledge we impart. As John Ciardi observed, "A good question is never answered. It is not a bolt to be tightened into place, but a seed to be planted and to bear more seed toward the hope of greening the landscape of idea."[51] To rise to the challenges of tomorrow, we must be deliberate in donning the mantle of new age mentorship today.

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REFERENCES

1. Geltzeiler MN, Lighthall JG, Wax MK. Mentorship in otolaryngology: 10 years of experience. *Otolaryngol Head Neck Surg*. 2013;148(2):338-340. doi:10.1177/0194599812468279

2. Faucett EA, Newsome H, Chelius T, Francis CL, Thompson DM, Flanary VA. African American otolaryngologists: current trends and factors influencing career choice. *Laryngoscope*. 2020;130(10):2336-2342. doi:10.1002/lary.28420

3. Sethia R, Sheehan CC, Danforth D, Essig G Jr, Teknos TN, Elmaraghy CA. ENT mentorship program for preclinical medical students. *Otolaryngol Head Neck Surg*. 2020;163(2):198-203. doi:10.1177/0194599819900261

4. Trends in Sex and Racial/Ethnic Diversity in Applicants to Surgery Residency and Fellowship Programs - PubMed. Accessed October 12, 2020. https://pubmed.ncbi.nlm.nih.gov/32459323/

5. Flexner A. Medical education in the United States and Canada. From the Carnegie Foundation for the Advancement of Teaching, Bulletin Number Four, 1910. *Bull World Health Organ*. 2002;80(7):594-602.

6. Chen F, Lui AM, Martinelli SM. A systematic review of the effectiveness of flipped classrooms in medical education. *Med Educ*. 2017;51(6):585-597. doi:10.1111/medu.13272

7. Morrison RJ, Bowe SN, Brenner MJ. Teaching quality improvement and patient safety in residency education: strategies for meaningful resident quality and safety initiatives. *JAMA Otolaryngol Head Neck Surg*. 2017;143(11):1069-1070. doi:10.1001/jamaoto.2017.1317

8. Waljee JF, Chopra V, Saint S. Mentoring millennials. *JAMA*. 2020;323(17):1716-1717. doi:10.1001/jama.2020.3085

9. Berwick DM. The moral determinants of health. *JAMA*. 2020;324(3):225-226. doi:10.1001/jama.2020.11129

10. Truesdale CM, Baugh RF, Brenner MJ, et al. Prioritizing diversity in otolaryngology-head and neck surgery: starting a conversation. *Otolaryngol Head Neck Surg*. Published online October 13, 2020. doi:10.1177/0194599820960722

11. Burks CA, Ortega G, Bergmark RW. COVID-19, disparities, and opportunities for equity in otolaryngology-unequal America. *JAMA Otolaryngol Head Neck Surg*. 2020. doi:10.1001/jamaoto.2020.2874

12. Vince RA Jr. Eradicating racial injustice in medicine-if not now, when? *JAMA*. 2020;324(5):451-452. doi:10.1001/jama.2020.12432

13. Schultz KS, Hess DT, Sachs TE, Tseng JF, Pernar LIM. A structured mentorship elective deepens personal connections and increases scholarly achievements of senior surgery residents. *J Surg Educ*. 2020;S1931-7204(20)30313-5. doi:10.1016/j.jsurg.2020.08.016

14. Shuman AG, Vercler CJ. HEC-C: from Halsted's perspective. *Am J Bioeth*. 2020;20(3):35-37. doi:10.1080/15265161.2020.1714797

15. Walensky RP, Kim Y, Chang Y, et al. The impact of active mentorship: results from a survey of faculty in the Department of Medicine at Massachusetts General Hospital. *BMC Med Educ*. 2018;18(1):108. doi:10.1186/s12909-018-1191-5

16. Fleming M, House S, Hanson VS, et al. The Mentoring Competency Assessment: validation of a new instrument to evaluate skills of research mentors. *Acad Med*. 2013;88(7):1002-1008. doi:10.1097/ACM.0b013e318295e298

17. Moreno NA, Dimick JB, Newman EA. Mentorship strategies to foster inclusivity in surgery during a virtual era. *Am J Surg*. 2020;220(6):1536-1538. doi:10.1016/j.amjsurg.2020.07.006

18. Musbahi O, Aydin A, Al Omran Y, Skilbeck CJ, Ahmed K. Current status of simulation in otolaryngology: a systematic review. *J Surg Educ*. 2017;74(2):203-215. doi:10.1016/j.jsurg.2016.09.007

19. Roberts NK, Brenner MJ, Williams RG, Kim MJ, Dunnington GL. Capturing the teachable moment: a grounded theory study of verbal teaching interactions in the operating room. *Surgery*. 2012;151(5):643-650. doi:10.1016/j.surg.2011.12.011

20. Rose S. Medical student education in the time of COVID-19. *JAMA*. 2020;323(21):2131-2132. doi:10.1001/jama.2020.5227

21. Nellis JC, Eisele DW, Francis HW, Hillel AT, Lin SY. Impact of a mentored student clerkship on underrepresented minority diversity in otolaryngology-head and neck surgery. *Laryngoscope*. 2016;126(12):2684-2688. doi:10.1002/lary.25992

22. Clarke AJ, Burgess A, van Diggele C, Mellis C. The role of reverse mentoring in medical education: current insights. *Adv Med Educ Pract*. 2019;10:693-701. doi:10.2147/AMEP.S179303

23. Akinla O, Hagan P, Atiomo W. A systematic review of the literature describing the outcomes of near-peer mentoring programs for first year medical students. *BMC Med Educ*. 2018;18(1):98. doi:10.1186/s12909-018-1195-1

24. Haggins A, Sandhu G, Ross PT. Value of near-peer mentorship from protégé and mentor perspectives: a strategy to increase physician workforce diversity. *J Natl Med Assoc*. 2018;110(4):399-406. doi:10.1016/j.jnma.2017.09.001

25. Weissman JS, Betancourt J, Campbell EG, et al. Resident physicians' preparedness to provide cross-cultural care. *JAMA*. 2005;294(9):1058-1067. doi:10.1001/jama.294.9.1058

26. Erridge S, Yeung DKT, Patel HRH, Purkayastha S. Telementoring of surgeons: a systematic review. *Surg Innov*. 2019;26(1):95-111. doi:10.1177/1553350618813250

27. Burgess LPA, Syms MJ, Holtel MR, Birkmire-Peters DP, Johnson RE, Ramsey MJ. Telemedicine: teleproctored endoscopic sinus surgery. *Laryngoscope*. 2002;112(2):216-219. doi:10.1097/00005537-200202000-00003

28. Klapan I, Simicić Lj, Pasarić K, et al. Realtime transfer of live video images in parallel with three-dimensional modelling of the surgical field in computer-assisted telesurgery. *J Telemed Telecare*. 2002;8(3):125-130. doi:10.1177/1357633X0200800301

29. Steehler AJ, Pettitt-Schieber B, Studer MB, Mahendran G, Pettitt BJ, Henriquez OA. Implementation and evaluation of a virtual elective in otolaryngology in the time of COVID-19. *Otolaryngol Head Neck Surg*. Published online August 11, 2020. doi:10.1177/0194599820951150

30. Farlow JL, Marchiano EJ, Fischer IP, Moyer JS, Thorne MC, Bohm LA. Addressing the impact of COVID-19 on the residency application process through a virtual subinternship. *Otolaryngol Head Neck Surg*. Published online June 9, 2020. doi:10.1177/0194599820934775

31. Comer BT, Gupta N, Mowry SE, Malekzadeh S. Otolaryngology education in the setting of COVID-19: current and future implications. *Otolaryngol Head Neck Surg*. 2020;163(1):70-74. doi:10.1177/0194599820923621

32. Retrouvey M, Keefe B, Kotsenas A, McGinty G, Patel AK. Women in radiology: creating a global mentorship network through social media. *J Am Coll Radiol*. 2018;15(1 Pt B):229-232. doi:10.1016/j.jacr.2017.09.029

33. Luc JGY, Stamp NL, Antonoff MB. Social media in the mentorship and networking of physicians: Important role for women in surgical specialties. *Am J Surg*. 2018;215(4):752-760. doi:10.1016/j.amjsurg.2018.02.011

34. @JBSmithMD. #OtoMatch2020 Adopt-An-Applicant. If you're an oto resident willing to give feedback to a rising applicant on personal statements, CVs, etc., please comment. If you're an applicant w/o a home program (or with one, but needing a little extra guidance), hit us up. #MedTwitter. Published July 13, 2020. https://twitter.com/JBSmithMD/status/1282847219486535682?s=20

35. @RoxanaDaneshjou. If you are a Black medical student interested in dermatology, please know you can reach out to me any time. I will answer your questions completely honestly, when those you may be afraid to ask from your home program. #medtwitter #dermtwitter. Published June 4, 2020. https://twitter.com/RoxanaDaneshjou/status/1268565281078571008?s=20

36. @OKaradaghy. Hey future ENTs! Not being able to do away rotations is a huge bummer. I am a rising PGY3 at @KU_ENT, and would be happy to answer any questions about interviews, our program, or residency in general!! Feel free to reply or DM. Published June 21, 2020. https://twitter.com/OKaradaghy/status/1274766410129051650?s=20

37. McLuckey MN, Gold JA, O'Glasser AY, Hingle S, Spencer A, Fick LB. Harnessing the Power of Medical Twitter for Mentorship. *J Grad Med Educ*. 2020;12(5):535-538. doi:10.4300/JGME-D-20-00549.1

38. @_shadiam. Hey #ENTwitter #MedStudentTwitter! We have a growing informal group chat of all the women applying this year. DM me and I'll send you the GroupMe link to add you or a future #shENT you know. Published September 12, 2020. https://twitter.com/_shadiam/status/1304878011519569932?s=20

39. Topol E. *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. Basic Books; 2019.

40. Shafiei SB, Hussein AA, Muldoon SF, Guru KA. Functional brain states measure mentor-trainee trust during robot-assisted surgery. *Sci Rep*. 2018;8(1):3667. doi:10.1038/s41598-018-22025-1

41. Kutob RM, Bormanis J, Crago M, Harris JM Jr, Senf J, Shisslak CM. Cultural competence education for practicing physicians: lessons in cultural humility, nonjudgmental behaviors, and health beliefs elicitation. *J Contin Educ Health Prof*. 2013;33(3):164-173. doi:10.1002/chp.21181

42. Tervalon M, Murray-García J. Cultural humility versus cultural competence: a critical distinction in defining physician training outcomes in multicultural education. *J Health Care Poor Underserved*. 1998;9(2):117-125. doi:10.1353/hpu.2010.0233

43. Walters KL, Simoni JM, Evans-Campbell TT, et al. Mentoring the mentors of underrepresented racial/ethnic minorities who are conducting HIV research: beyond cultural competency. *AIDS Behav*. 2016;20(suppl 2):288-293. doi:10.1007/s10461-016-1491-x

44. Fisher-Borne M, Cain JM, Martin SL. From mastery to accountability: cultural humility as an alternative to cultural competence. *Soc Work Educ*. 2015;34(2):165-181. doi:10.1080/02615479.2014.977244

45. Morris B. Why Does Zoom Exhaust You? Science Has an Answer - WSJ. Accessed October 12, 2020. https://www.wsj.com/articles/why-does-zoom-exhaust-you-science-has-an-answer-11590600269

46. Ignagni K. Failing to bridge the digital divide will deepen health disparities. Modern Healthcare. https://www.modernhealthcare.com/opinion-editorial/failing-bridge-digital-divide-will-deepen-health-disparities. Published July 11, 2020. Accessed October 15, 2020.

47. Makri A. Bridging the digital divide in health care. *The Lancet Digital Health*. 2019;1(5):e204-e205. doi:10.1016/S2589-7500(19)30111-6

48. Clutterbuck D, Ragins BR. *Mentoring and Diversity*. 1st Edition. Butterworth-Heinemann; 2002.

49. Jordan J, Watcha D, Cassella C, Kaji AH, Trivedi S. Impact of a mentorship program on medical student burnout. *AEM Educ Train*. 2019;3(3):218-225. doi:10.1002/aet2.10354

50. Gawande A. *Better: A Surgeon's Notes on Performance*. 1st Edition. Metropolitan Books; 2008.

51. Ciardi J. *Manner of Speaking*. Rutgers University Press; 1972.