



Developing Early Pathways to Otolaryngology

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Abstract

Purpose of the Review The purpose of this review is to emphasize the implementation of strategies and initiatives to develop early career pathways to otolaryngology-head and neck surgery (OHNS) for individuals underrepresented in medicine (UIM).

Recent Findings Recent studies have shown that clinical experience, early exposure, and mentorship play an influential role in a student's decision to pursue a medical specialty.

Summary Diversity in healthcare has been shown to help promote greater healthcare outcomes and address health disparities. To create a workforce that reflects the diversity of the US patient population, intentional initiatives and early pathways must be developed to support students UIM.

Keywords Otolaryngology-head and neck surgery · Underrepresented in medicine · Early clinical exposure · Research · Mentorship · Diversity

Introduction

Throughout medicine in the USA, the demographics of the physician workforce do not match that of the population. Individuals underrepresented in medicine (UIM)—defined by Black, Hispanic/Latino, mainland Puerto Rican, Native American, Alaskan Native, and Native Hawaiian [1]—compose a mere 11% of the physician workforce [2] despite comprising 35% of the US population [3]. This lack of diversity is emphasized further within surgery and surgical subspecialties,

including within otolaryngology-head and neck surgery (OHNS). UIM students have been underrepresented in OHNS residency applications: <7% for Black students and <10% for Hispanic students each year from 2018 to 2022 (Fig. 1) [4]. This propagates further following medical education. For example, in 2019, 6.2% of resident trainees and 4.1% of full professors were Hispanic while 2.3% of resident trainees and 1.7% of full professors were Black [5].

The benefits of diversity in the physician workforce have been well documented, specifically regarding the positive impact on patient care. UIM physicians are more likely to serve

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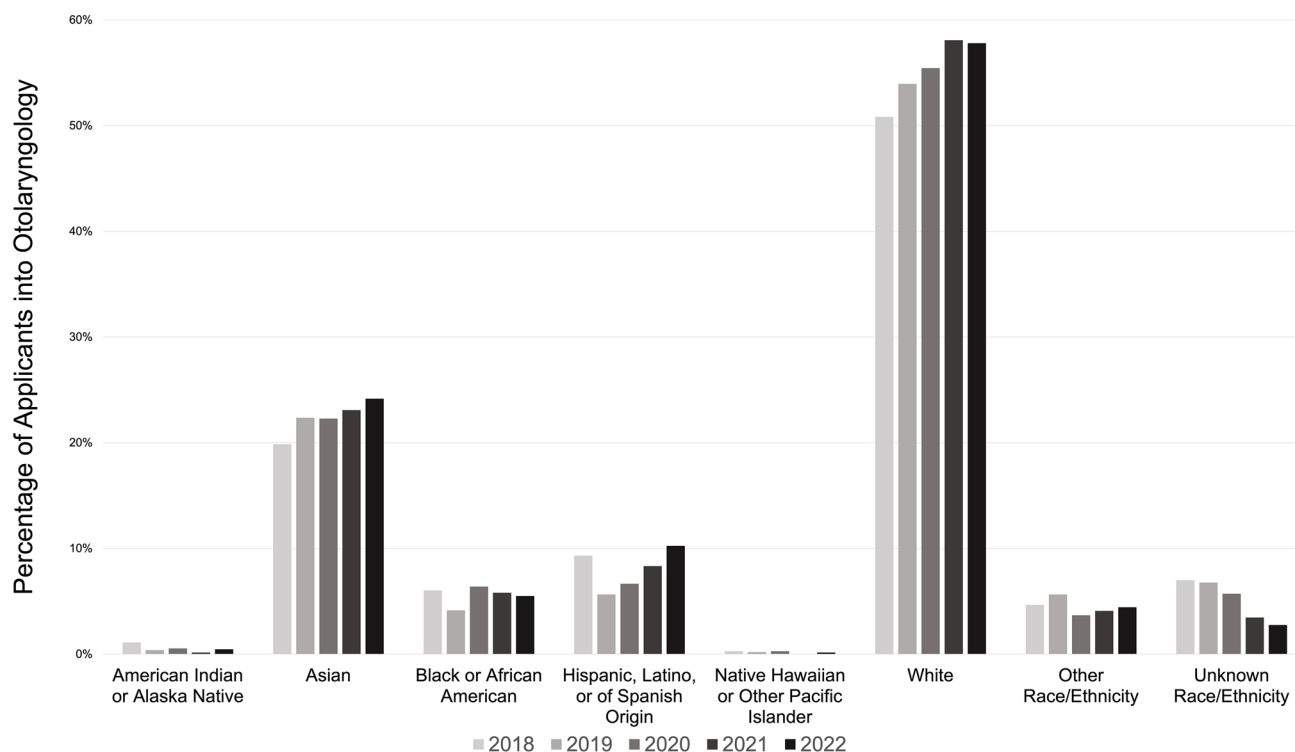


Fig. 1 Percentage of applicants by race/ethnicity to otolaryngology residencies from 2018 to 2022 according to ERAS Data [4]

low-income, Medicaid, and uninsured patients and are more likely to practice medicine in underserved areas [6–9]. Racial/ethnic minority patients often seek care from and report greater satisfaction with their care when it is provided by racially/ethnically concordant physicians, and they are more likely to participate in clinical trials if the team of investigators is comprised of diverse members [10–14]. In regard to medical education, diversity in the physician workforce improves the awareness and education experience of non-minority trainees and creates higher-performing teams [15]. To improve patient outcomes, increase health care equity, and optimize health care teams, increasing the diversity in the physician workforce is of paramount importance.

Early pathways must be developed and supported for pre-medical students and beyond in order to create a sustainable pipeline of UIM students to OHNS [16••]. The aim of this review is to describe strategies to increase the UIM student pipeline to OHNS through the provision of early exposure to the field, early involvement in research, and early mentorship and career development support (Table 1).

Early Clinical Exposure to Otolaryngology

Required Medical School Clerkships

During medical school, clerkship rotations are an essential time for hands-on exploration of medical and surgical

subspecialties. The power of exposure alone can impact a student's career trajectory. In a recent survey by Faucett et al. of African-American practicing otolaryngologists, 67% of respondents selected OHNS because they enjoyed it during their medical school clerkship, and early exposure to the field was a major driver for their career choice [17]. It should be noted that many medical students have limited exposure to surgical subspecialties such as orthopedic surgery, plastic and reconstructive surgery, ophthalmology, urology, and OHNS because they are not required in the general medical school curriculum [18]. In fact, the Association of American Medical Colleges reported a decline in medical schools requiring surgical specialty education from 33% in 2017–2018 to 26% in 2019–2020 [19]. This presents a tangible area for action. In the orthopedic surgery literature, London et al. report the positive impact of a required musculoskeletal (MSK) clerkship at a single institution on the diversity of the applicant pool to orthopedic surgery residency [20]. Retrospective survey data from students who were required to take a 1-month MSK clerkship compared to those who were not demonstrated that 88% of students were positively influenced to apply to orthopedic surgery residency. Among UIM applicants, there was a 101% relative increase in the proportion of applicants to orthopedic surgery following the implementation of the required clerkship. Bernstein et al. also demonstrated that students who participated in required musculoskeletal clerkships had a higher rate of

Table 1 Methods for developing early pathways to OHNS**Early clinical exposure to OHNS**

- Required medical school clerkships
- Partnerships with institutions without OHNS departments
- Funded visiting clerkships
- Nationwide initiatives
- Virtual platforms

Early exposure to research in OHNS

- Establishing research mentor initiatives
- Fortifying the pipeline for physician-scientists
- Funding mechanisms for attendance/presentations at national conferences

Early mentorship and career development

- Mentored, nationwide initiatives and clerkships
- Meaningful connections with UIM mentors for UIM students considering OHNS
- UIM specialty society networking
- Representation of UIM residents and faculty

OHNS otolaryngology-head and neck surgery; *UIM* underrepresented in medicine

applications to orthopedic residency programs versus students who did not [21]. In a survey of 122 U.S. medical schools in 2002, 55% of 16,294 medical school graduates had required MSK coursework [21]. For UIM students with required MSK coursework versus without required coursework, the rate of application to orthopedic surgery residency was 8.2% and 6.1%, respectively [21]. Required clerkships in OHNS (and other surgical subspecialties) should therefore be considered across medical schools to help address the lack of UIM diversity in the field.

Partnerships with Medical Schools Without OHNS Departments

A student without an OHNS home program faces a multitude of obstacles. For example, the inability to obtain early exposure to and mentorship within OHNS impacts the intensive academic portfolio often required to match. Barring the competitive nature and limited residency positions in this specialty, the absence of a home residency program, a network, and research opportunities can be particularly limiting in nature. Oftentimes, students without a home program must search for support, either through local otolaryngologists in private practice or local institutions, while simultaneously completing their required coursework [22]. Furthermore, the lack of home OHNS programs at all four historically Black medical colleges; Meharry Medical College, Howard University College of Medicine, Morehouse School of Medicine, and Charles R. Drew University of Medicine and Science propagates a barrier for UIM students entering OHNS. This offers a tangible area for action. Partnerships with local and regional academic institutions with OHNS departments along with national OHNS societies can be developed and bolstered. Partnerships across institutions have been previously described (i.e., Meharry-Vanderbilt Alliance, Howard and Georgetown Memorandum of Understanding, etc.) to bolster collaborative research efforts

and community engagement. However, formalized partnerships regarding medical student-required clerkships, involvement in OHNS student interest groups, provision of resident and faculty mentorship, and opportunities for research across institutions would be invaluable.

Collaborative Nationwide Initiatives

Nationwide initiatives—led by OHNS national societies in collaboration with medical institutions, undergraduate programs, and high schools—such as summer internship programs and virtual platforms provide significant opportunities for early exposure to and career development in OHNS. In the orthopedic literature, Mason et al. describe an 8-week clinical and research summer internship in orthopedic surgery geared specifically for medical students [23]. First-year medical students of all races/ethnicities can apply for the program which includes MSK lectures, hands-on workshops, research projects, mentorship, and counseling throughout the remainder of each participant's medical school career. Between 2005 and 2012, 118 medical students completed this program. The racial/ethnic composition of the participating medical students was 69% Black ($n = 82$), 14% Latino ($n = 16$), 9% White ($n = 11$), 5% Native American/Indian ($n = 6$), and 3% Asian ($n = 3$) [23]. Completion of the summer internship program was associated with increased odds of applying to an orthopedic surgery residency. For example, for UIM students, 31% of participants ($n = 15$ of 48) applied to orthopedic surgery residency vs 3% of UIM nonparticipants nationally ($n = 782$ of 25,676; odds ratio, 14.5 [95% CI, 7.3–27.5]; $P < 0.001$) [23]. The match success rate was 76% for participants of this summer internship program. Virtual platforms should also be exploited to maximize outreach potential to UIM students nationwide. For example, a collaboration with the student interest groups from Meharry,

Morehouse, and Howard medical schools, the Student National Medical Association (SNMA) Otolaryngology Student Interest Group, and Harvard Medical School/Massachusetts Eye and Ear birthed a novel program. The “SNMA-Harvard: Is Oto in Your Future?” program created a platform to increase the visibility of OHNS to UIM students. This alliance has generated invaluable avenues for mentorship, research, and networking. Similarly, programs to “leverage the virtual landscape” have provided informational sessions to introduce OHNS, Diverse Equity Inclusion (DEI) initiatives on social media and provide virtual mock interviews for interview sessions [24, 25••,26]. These platforms have increased accessibility and the range of students that can be reached. Overall, virtual platforms have been shown to be invaluable in engaging and connecting students with the necessary resources to succeed.

Funded Elective Visiting Clerkships

Mentored clerkship opportunities have increased medical student interest in residency training programs and provide a platform for students to ascertain a particular interest in academic medicine. Many institutions and national professional organizations have established funded visiting clerkships to support and address financial barriers students may face [27]. Common support includes a waived registration fee, compensation, and/or a housing stipend provided upon acceptance [28]. For example, the American Association of Otolaryngology-Head and Neck Surgery established the Diversity Endowment URM Away Rotation Grant which provides \$1000 to use toward travel, housing, or food during their clinical rotation. Similarly, the Society of University Otolaryngologists (SUO) has also established the URiM Away Rotation scholarship which provides funds up to \$2000 for students during their clinical rotation. Various institutions have followed suit to establish affordable opportunities for students to gain clinical and research training.

Early Exposure to Research in Otolaryngology

Early exposure to research is essential for students pursuing OHNS. Academic productivity or clear dedication to scholarly pursuits is often a metric of interest for students applying to OHNS. In addition to contributing to the literature, the benefits of student participation in research are innumerable, including the ability to formulate a hypothesis, develop sound investigative methods, and explore the process of answering a research question. In addition, student research projects provide an opportunity to enhance oratory presentation skills and connect with mentors. Research

mentors may also serve as advocates and letter writers in the residency match process. Unfortunately, the lack of diversity that is seen in medicine extends to physician-scientists starting early in training. From 1975 to 2014, 10,000 MD-PhD students graduated from medical science training programs—3.7% of graduates were Black students and 4% were Hispanic students [29]. When one looks ahead to CORE grant and NIH grant funding, disparities persist in regard to lack of funding for UIM individuals [30••]. For example, a review of CORE grant recipients in 2010 demonstrated 2.2% were Black and 2.2% were Hispanic while in 2019, 3.0% were Black and 0.0% Hispanic [30••]. Among faculty across academic medicine, UIM people make up only 2.8%, 2.1%, and 1.0% of funded early-stage, new, and experienced investigators [29]. As such, it is important to create pathways, initiatives, and programs that provide early opportunities to develop and hone research technical skills while connecting with mentors. Initial interest in research can be inspired through invitations to UIM undergraduate and medical school students to participate in journal clubs and didactics hosted by OHNS departments. Other actionable approaches include scholarship-based research externship programs, funding opportunities for summer research via national professional societies, virtual research opportunities, and institutional/national professional society-funded support for conference attendance/presentations. As research acumen is often used as a barometer for student and academic success, it is important to create opportunities for UIM students to explore this aspect of the field of otolaryngology.

Early Mentorship and Career Development

Early access to dedicated mentorship and career development is vital for students considering OHNS. The reputation OHNS has as a competitive, highly selective surgical subspecialty may serve as a deterrent to student interest—including UIM students [31]. Therefore, early mentorship can guide and encourage students to consider a career in OHNS. Formalized mentorship programs have yielded great success in developing young UIM surgeons in academic surgery, exemplified in the general surgery literature. Butler et al. describe the development of the Diverse Surgeons Initiative—a program that comprises three 2-day sessions over a 9-month period which provided UIM general surgery trainees with fundamental surgical techniques, anatomy review, disease pathophysiology lectures, and case-based preparation for yearly in-service examinations—to increase UIM representation in minimally invasive surgery and best prepare trainees for success in fellowship and beyond [32]. This program however grew to include UIM trainees (nominated for this program by their program directors) and young faculty with interests outside of minimally invasive surgery due to the offered mentorship and career development for

Table 2 Recent research in developing early pathways to OHNS

Title	Authors (year)	Design	Theme	Findings
Impact of a Mentored Student Clerkship on Underrepresented Minority Diversity in OHNS	Nellis JC et al., 2016 [27]	Prospective Observational Study	Impact of a mentored OHNS clerkship initiative on UIM medical students	Mentored clerkships for UIM medical students increase interest in applying to OHNS residency training programs and is a successful approach to increasing physician diversity
African American Otolaryngologists: Current Trends and Factors Influencing Career Choice	Faucett et al., 2020 [17]	Quantitative Survey Study	Factors that influence African American physicians to choose OHNS	Early exposure, intentional mentoring, and development of African American role models may help increase the number of African American OHNS faculty
Prioritizing Diversity in OHNS: Starting a Conversation	Truesdale, CM et al., 2020 [5]	Commentary	Addressing the leaky pipeline in academic OHNS and prioritizing diversity	Departmental leadership is critical to advancing diversity in OHNS
Critical Components of Diversity Initiatives	Esianor et al., 2021 [25●●]	Review Article	Identifying critical components of diversity initiatives	Identifying stakeholders, team development, reflection on the past, analysis of the present, preparation for the future, continuous quality improvement
Diversifying Researchers and Funding in Otolaryngology	Fang et al., 2021 [30]	Review Article	Implications of research funding disparities in OHNS and approaches to promote equity	Early research exposure and funding for women and individuals UJM are necessary to promote parity and equity
Online Otolaryngology: A Comprehensive Model for Medical Student Engagement in the Virtual Era and Beyond	Landeem KC et al., 2021 [24]	Comprehensive Overview	Online OHNS resources for medical students	Virtual platforms can provide opportunities for economically disadvantaged candidates to match into competitive subspecialties like OHNS and provide networking, education, and mentorship opportunities
Strategies to Increase Racial and Ethnic Diversity in the Surgical Workforce: A State-of-the-Art Review	Burks et al., 2022 [16●●]	Systematic Review	Strategies to increase diversity in the surgical workforce	Internship programs, required clerkships, diversifying recruitment and selection process for residency match and faculty hiring, increasing representation among trainees, faculty, and leadership, holistic review processes, departmental commitment
The Value of Diversity, Equity, and Inclusion in Otolaryngology	Francis et al., 2022 [36]	Review Article	The value of DEI in OHNS	DEI within OHNS benefits our patients and practices by helping to decrease healthcare disparities and improving cultural humility

Table 2 (continued)

Title	Authors (year)	Design	Theme	Findings
Hurdles in Diversifying Otolaryngology: A Survey of Medical Students	Johnson BC et al., 2022 [18]	Quantitative Survey Study	Identifying factors that influence low racial and ethnic diversity within OHNS	The most common reasons for disinterest in OHNS included competitiveness, inadequate exposure, research, and the high board scores needed to match
Home Away From Home: Mentorship and Research in Private Practices for Students Without Home Programs	Ramirez et al., 2022 [22]	Retrospective Cohort Study	Private practice resources for medical students without a home OHNS department	Private practices may provide research and mentorship for students with limited resources
Perceptions of Otolaryngology Residency Among Students Underrepresented in Medicine	Thompson-Harvey A. et al., 2022 [34]	Quantitative Survey Study	Perceptions of OHNS and factors affecting application to OHNS among UIM students	UIM students applying to OHNS value race-concordant mentorship, involvement in research, and meaningful mentorship relationships with their respective OHNS department
Association Between Racial and Ethnic Diversity in Medical Specialties and Residency Application Rates	Tiako M.J.N. et al. 2022 [35]	National Cross-Sectional Study	Residency application rates for medical specialties by race and ethnicity	UIM students in particular apply to a given specialty for residency that has representation of their racial or ethnic group among practicing physicians in the specialty
Leveraging the virtual landscape to promote diversity, equity, and inclusion in Otolaryngology-Head & Neck Surgery	Ortega CA et al., 2023 [26]	Comprehensive Overview	Impact of virtual platforms on DEI in OHNS	Strategies that can help attract UIM applicants include inclusive departmental web presence, interactive online clinical experiences, virtual interviews, and remote research opportunities

OHNS otolaryngology-head and neck surgery; *UIM* underrepresented in medicine; *DEI* diversity equity and inclusion

success in academic surgery. A review of the graduates from the Diverse Surgeons Initiative from 2002 to 2009 demonstrated that 99% completed general surgery residency; 87% completed fellowship training; 50% received a fellowship in the American College of Surgeons; 41% served in faculty positions; and 18% served in leadership positions. Consideration of a similar OHNS initiative with the support of an OHNS national professional society has the potential to have a significant impact on UIM students, trainees, and junior faculty in OHNS. The mentorship was also vital to the overall experience of students during a visiting clerkship in OHNS, as described by Nellis et al. [27]. Based upon early subspecialty interests, UIM students were assigned to mentors during the clerkship, creating opportunities for research collaboration and discussions regarding long-term career goals. Of the 15 students who participated in the clerkship, 7 students went on to apply to OHNS residency programs, and 6 matched successfully.

Regarding mentorship, it is important to additionally note the specific impact of UIM mentors on UIM students. In a survey of UIM high school students following the completion of a health professional development program, Kendrick et al. demonstrated that racial/ethnic concordance between preceptor and student was significantly associated with viewing the preceptor as a role model ($p=0.028$) [33]. Representation—across all levels of medical education, training, and institutional leadership—matters [34, 35]. National professional societies such as the Harry Barnes Medical Society and virtual platforms such as the Black Otolaryngologist Network have played a vital role for hosting opportunities for medical students and resident trainees to connect with fellow and senior faculty mentors in preparation for a successful career in OHNS. The Harry Barnes Medical Society was founded in 1989 by Black otolaryngologists of the National Medical Association to honor Dr. Barnes (the first board-certified Black otolaryngologist) and generations of UIM students and trainees in otolaryngology. The Black Otolaryngologist Network, a nonprofit organization founded in 2020, with the mission to promote mentorship, sponsorship, and the advancement of UIM students and trainees in the field. It is essential for non-minority-identifying professional societies to partner with minority-identifying platforms and societies to optimize outreach and maximize the opportunities available to UIM students.

Conclusions

Currently, the diversity of the surgical workforce does not reflect the diversity of the general patient population, and ultimately this continues to contribute to disparities in health equity. There is an urgent need to diversify the OHNS workforce to better meet patient needs and to impact generations of future otolaryngologists [36]. Although recent literature has focused on diversity in OHNS (Table 2), further work to

understand the specific barriers faced by UIM students pursuing a career in OHNS is crucial. Through concerted, collaborative effort and unwavering commitment to develop formalized early pathways to OHNS for UIM students, significant progress can and will be made in addressing the diversity in the OHNS workforce.

Declarations

Conflict of Interest Regan W. Bergmark reports Nesson Fellow, Brigham and Women's Hospital (Institutional faculty grant funding and salary support for research on disparities in timely access to high-quality surgical care); United Against Racism Subspecialty Grant, Mass General Brigham; Grant funding, I-Mab Biopharma. Ciersten A. Burks reports United Against Racism Subspecialty Grant, Mass General Brigham. The other authors declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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