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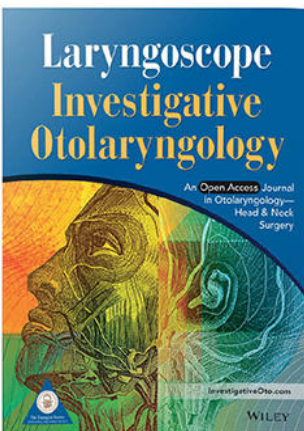


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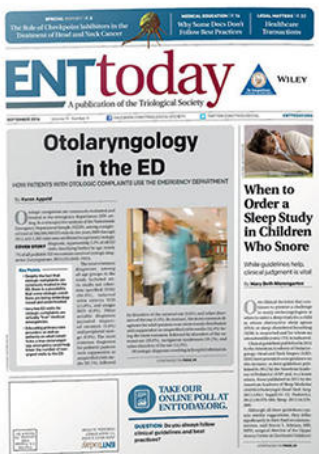
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Impact of a Mentored Student Clerkship on Underrepresented Minority Diversity in Otolaryngology–Head and Neck Surgery

Jason C. Nellis, MD; David W. Eisele, MD; Howard W. Francis, MD; Alexander T. Hillel, MD;
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Objectives/Hypothesis: To describe the impact of a mentored clerkship initiative on underrepresented minority medical students interested in otolaryngology–head and neck surgery (OHNS).

Study Design: Prospective observational study.

Methods: An outreach effort to recruit underrepresented minority students was initiated in 2008, consisting of either a 3-month research clerkship or a 1-month clinical rotation. Financial assistance and faculty mentorship was provided for students. Upon conclusion of the clerkship, students completed a post-clerkship evaluation form. Students were followed regarding residency applications, match status, and publications. Evaluations were compiled and analyzed. The number of publications resulting from interaction with faculty mentors was calculated.

Results: Fifteen students participated in the clerkship from 11 medical schools. Of those, 10 students participated in the clinical clerkship, four in the research clerkship, and one in both clerkships. Evaluation (5-point Likert scale) average scores and comments revealed high student satisfaction with the rotations (4.85), provided individual mentorship (4.85), and provided exposure to academic medicine (4.92). Participants indicated the rotation favorably impacted their decision to apply for OHNS residency training and increased their interest in academic medicine. The participants had an average number of 1.7 publications, with 1.18 publications in OHNS journals. Six publications resulted from direct interaction between students and faculty during the clerkship. Seven students applied for OHNS residency programs, and six matched successfully.

Conclusion: Mentored clerkships for underrepresented minority medical students increases interest in applying to OHNS residency training programs and is a successful approach to increasing physician diversity. It provides a pathway to expand research opportunities and increase student interest in academic medicine.

Key Words: Mentorship, underrepresented minorities, diversity, clerkship, medical student.

Level of Evidence: NA

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INTRODUCTION

Minority groups, including African Americans, Hispanics or Latinos, and Asian Americans, represent greater than 37% of the total U.S. population, with projections that non-Hispanic whites will become the minority by 2042.¹ In light of these sweeping demographic changes, there has been growing literature focusing on healthcare disparities.² Proposed solutions to disparities in healthcare outcomes for minorities include promoting research targeted to minority health-specific issues, improving access for minority groups, increasing funding of public health initiatives, training providers in cultural competence, and increasing diversity of healthcare providers.³ The importance of increasing the diversity of

providers is highlighted in studies showing that minority physicians tend to serve patients from minority groups with consideration of health inequalities and disease prevention.⁴ Patient–physician race concordance also improves the overall quality of care in at risk groups.⁵ Furthermore, potential benefits of a more diverse workforce include the delivery of more culturally competent and cost-effective care for all.^{6,7}

Multiple studies investigating the composition of medical students, resident physicians, and faculty have revealed a dearth of underrepresented minorities in the pool of trainees and academic physicians.^{3,8–11} Based on significantly low representation in the physician workforce relative to the generation population, the U.S. Federal government has designated underrepresented minorities (URM) to include African Americans, Hispanics, and Native Americans.⁴ Moreover, minority representation in otolaryngology–head and neck surgery (OHNS) has been reported as significantly lower compared to other medical specialties.^{8,12} Unfortunately, the representation of these groups in the OHNS physician workforce is declining. African American representation, for example, is declining by 2.3% per year. Native American representation remains low with growth of only 1.5% per year, and Hispanics representation is growing at 17.3% per year, half the rate of growth in the

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general population growth.⁸ To alter the course of these trends, departments and healthcare systems must develop initiatives to promote representation of underrepresented minorities.

Striving to improve diversity in the healthcare workforce, several strategies have been discussed.^{3,8,10,13} Many believe that attention should turn toward improving the *pipe*, referring to the Pipeline Theory, stating that the lack of diversity in residency programs and faculty results from a sequential loss of underrepresented minorities when transitioning from high school to college to medical school to residency and onward.^{8,13} Hence, resources have focused on increasing recruitment at the university and medical school level. Already, medical school admission committees have expanded underrepresented minorities acceptance rates, provided scholarships, and created departments dedicated to multicultural affairs.¹⁴ To address both reduced exposure to OHNS in most medical school programs and the need for early guidance to compete successfully for residency positions, establishing opportunities for faculty mentorship and role models may be essential in influencing a medical student's choice of clinical field for residency training.¹⁵

We describe the initiative named the Johns Hopkins Department of Otolaryngology–Head and Neck Surgery Clerkship Program for Underrepresented Minority Medical Students (Baltimore, MD). To our knowledge, this is the first mentored clerkship initiative dedicated to providing an opportunity for medical students who are members of underrepresented minority groups specifically interested in pursuing a career in OHNS. The mission of the clerkship is to offer URM medical students interested in OHNS mentorship, while providing clinical and research training opportunities at a tertiary academic medical department. The objective for the department is to develop a pipeline of URM medical students to recruit and retain within the field of OHNS, with the hope of increasing the physician diversity within the specialty.

MATERIALS AND METHODS

The Johns Hopkins Department of Otolaryngology–Head and Neck Surgery established a diversity committee comprised of faculty members and residents in 2008. The committee created the clerkship program for underrepresented minority medical students when the need was recognized to increase the pipeline of medical students entering the field of OHNS and becoming successful candidates in one of the most competitive specialties for residency selection. Institutional review board approval was obtained to follow students involved in the clerkship. The clerkship is publicized by posting information regarding the clerkship opportunities on the department website, as well as including print flyers at the Student National Medical Association annual conferences and contacting the dean of medical students at traditionally URM medical schools so that they are familiar with this opportunity. Medical students are encouraged on the website to directly contact the department's faculty director of diversity and inclusion efforts. Clerkships are available to underrepresented minority medical students attending Liaison Committee on Medical Education-approved U.S. and Canadian medical schools.

Student can apply to two types of clerkships, including a 1-month clinical clerkship or a 3-month research and clinical clerkship in OHNS. The 1-month clinical clerkship gives third- and fourth-year medical students close interactions with patients, residents, and faculty while serving on different subspecialty teams for 1 week at a time, typically as a subintern on service. The 3-month research and clinical clerkship involves a rotation structure based on student preferences dedicating time solely to research or a combination of research with clinical time. Students must have completed at least 1 year of medical school education prior to applying for the 3-month clerkship. The primary focus of the clerkship must be research for which students participate in either basic science or clinical research. Students remain in contact with mentors during and after the clerkship to complete any projects and publications resulting from the research experience.

The application process is similar to that of all visiting medical students at the Johns Hopkins University School of Medicine. Students must submit an elective application, letter of recommendation, and good standing from the Dean's office; official transcript demonstrating completion of prerequisites; confidentiality agreement form; and immunization record form verifying necessary requirements 3 to 6 months in advance of their rotation. Upon acceptance, the clerkship program offers financial assistance by paying the registration fee and providing a nominal stipend toward housing.

For all clerkships, mentorship remains an important component. Upon scheduling the clerkship, a mentor is assigned based on the student's subspecialty preference. Furthermore, the mentor and student schedule a meeting at the beginning for an introduction the clerkship and department to discuss clerkship goals, career goals, and any questions. Throughout the clerkship, mentors meet with the rotating student once a week or more to discuss feedback, concerns, possible research interests, teaching, and career mentorship.

Upon completion of the clerkship, various outcomes were followed to assess the impact of the clerkship. Feedback and evaluations were provided by the clerkship coordinator, mentors, and residents. Evaluation forms were sent to the student's medical school, with a 5-point Likert scale for each item. Students fill out a postrotation evaluation reflecting on their clerkship experience. These responses were recorded and analyzed. After residency match, the students were contacted to discover information regarding matched residency and research involvement with publications. The resulting residency match and number of publications were recorded. Further information was extracted by searching for students' publications on OvidSP system, PubMed, and Google Scholar. Nonparametric analysis of variance and Mann-Whitney U test were used to compare student outcomes, including average evaluation scores and average publications. Pearson's chi-squared test was used to compare student match results.

RESULTS

Fifteen students participated in the clerkship from eleven medical schools between August 2009 and June 2015. Of these, 10 students participated in the clinical clerkship, four in the research clerkship, and one in both clerkships. Of those participating in the clinical clerkship, nine of the students were fourth-year medical students and one was a third-year medical student. Of those participating in the research clerkship, three students were in the summer between the first and second year of medical school and one student was a fourth-year medical student. The student who participated in

Evaluation Form Questions	
1.	I felt the rotation met my expectations
2.	The rotation was a good exposure to a broad range of subjects in otolaryngology-head and neck surgery
3.	The rotation was a good exposure to academic medicine
4.	I received appropriate mentorship during my rotation
5.	The rotation favorably impacted my decision to consider applying to an otolaryngology residency
6.	The rotation favorably impacted my decision to consider working in an academic position upon completion of my residency
7.	If research was part of your rotation my research experience was educational and met my expectations

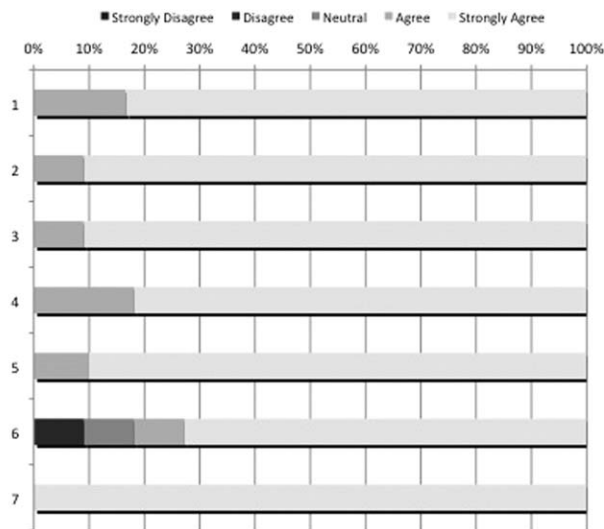


Fig. 1. Evaluation form results. Distribution of scores on scale of 1–5: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree. (n = 3).

both clerkships rotated in the summer between the first and second year for the research clerkship and returned as a third-year medical student for the clinical clerkship. Students came from various home institutions across the United States. These included the following medical schools: Morehouse School of Medicine, John A. Burns School of Medicine–University of Hawaii, University of Virginia School of Medicine, Meharry Medical College, Texas Tech University Health Sciences Center, University of Texas Medical Branch at Galveston, Howard University College of Medicine, University of Kentucky College of Medicine, University of Iowa Carver College of Medicine, Indiana University School of Medicine, and University of Illinois at Chicago College of Medicine.

Thirteen postrotation evaluations for the clerkship were completed by the students. Average 5-point Likert scores and comments revealed high student satisfaction with the rotations (4.85), individual mentorship (4.85), and exposure to academic medicine (4.92). The distribution of 5-point Likert scores, as well as the evaluation questions, are shown in Figure 1. Nonparametric analysis of variance comparing average evaluation scores showed no significant difference between students participating in research, clinical, or both clerkships ($P = 0.54$). Participants indicated that the rotation favorably impacted their decision to apply for OHNS residency training and increased their interest in academic medicine.

Students provided specific feedback expressed in the free-response comment section. The majority of students indicated that they valued the individual mentorship, including comments such as “It was great to come in as a visiting student and know already that I had a mentor who was there to bounce ideas off of and serve as an advocate.” Additionally, “Having a faculty mentor was an extremely positive component of the clerkship. The mentorship allowed me to feel at home in the department. I believe this played a significant role in the positive experience I had.” More specifically,

“Meeting with my mentor every week was also beneficial as it allowed me to get feedback and direction.” One student involved in research stated, “My faculty advisors not only provided effective guidance for my summer projects, but also influenced my future career plans,” further commenting that the mentors “truly demonstrated their investment in my success as a medical student, researcher, and future physician.”

As shown in Figure 2, both clinical and research clerkships resulted in students applying for OHNS residency programs and matching to an OHNS residency program. Additionally, the participants had an average number of 1.7 publications, with 1.18 publications in OHNS journals. Six publications resulted because of direct interaction between students and faculty during the clerkship. Comparing students involved in research and clinical clerkships revealed no significant difference in average total publications ($P = 0.20$) or OHNS publications ($P = 0.25$). Moreover, seven students applied for OHNS residency programs, and six matched successfully. Students who participated in the clinical clerkship were more likely to match into OHNS than those who participated in the research clerkship ($P = 0.03$). Three

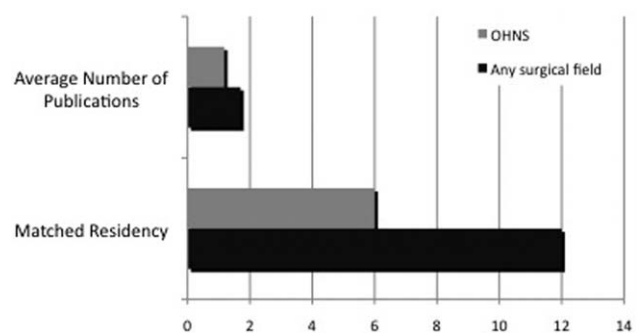


Fig. 2. Student outcomes after diversity clerkship.

students matched at the Johns Hopkins residency-training program in Otolaryngology–Head and Neck Surgery.

The diversity within the Hopkins residency was examined for both 2008 and 2014. In 2008, there were 22 residents with URM representation, including zero African American residents, two Hispanic residents, and zero Native American residents. In 2014, there were 25 residents with URM representation, including two African American residents, two Hispanic residents, and zero Native American residents. Underrepresented minorities representation increased from 9% to 16% of total residents, with African American representation increasing from 0% to 8%. Hispanic representation remained at 8% and Native American representation remained 0%.

DISCUSSION

The OHNS Clerkship Program for URM Medical Students demonstrated the positive impact of individual mentorship with URM students interested in OHNS residency. The URM mentored clerkship offers medical students an opportunity to integrate into the clinical teams, immerse in research, and align with a mentor in a setting valuing diversity, inclusion, and support. The rotation translated into several published research paper for students. Additionally, six of seven students who participated in this program applied for OHNS residency and successfully matched.

Several arguments have been made encouraging increased diversity in the health professional workforce. In 2006, the U.S. Department of Health and Human Services reviewed 55 studies, providing a rationale for diversity in the health professions. The studies reviewed support the argument that minority physicians disproportionately serve patients from minority groups and disadvantaged backgrounds.⁵ Moreover, patient–physician race concordance improves quality of care defined by better interpersonal care, technical aspects of care, and elimination of disparities.⁵ Hence, physicians are more likely to address health inequalities and disease prevention.⁴ Increasing diversity within OHNS residency programs could produce a future collective of otolaryngologists that would potentially increase access and improve quality of care for patients from underserved populations and diverse groups.¹⁶ However, efforts focused on improving diversity of the OHNS physician workforce will need to be thoughtfully planned out and actively implemented.

The clerkship aims to address some of the various barriers to increasing diversity in OHNS. First, the clerkship addresses the current inadequate pipeline of URM students entering OHNS residency.^{8,13} The clerkship experience proved valuable because of the general lack of exposure to the OHNS specialty and the unavailability of mentorship at the students' home institution. Hence, a significant factor contributing to the success of the clerkship was the role of mentorship. Repeatedly on postclerkship evaluations, students commented that "mentorship far exceeded expectations," with mentors providing advice, assisting in transition, delivering feed-

back, and providing direction. Studies involving role models and student relationships have described students emulating mentors.^{15,17} Wright¹⁵ investigated the strength of the association between role models and students' choice of clinical field, finding that 89% of medical students identify faculty role models during their third or fourth year in medical school. Within surgery, students exposed to positive role models within a field had higher odds of choosing that specialty (odds ratio 3.6; 95% confidence interval 1.4–9.3).¹⁵ Serving as role models, mentors have significant impact by providing advice regarding career choices and academic preparation for a competitive selection process.

Active mentorship of minority students increases the likelihood to pursue careers in academic medicine, including OHNS and other surgical fields.^{15,16} Yehia¹⁷ demonstrated that mentors have a positive influence on residents choosing a career in academic medicine. Notably, residents valued racial and gender concordance describing mentors as sharing a sense of history and understanding of both personal and professional career paths.¹⁷ Additionally, the survey reported that minority residents actively seek out same gender and race/ethnic mentors but find difficulty. The lack of URM faculty and residents who can serve as mentors remains a barrier in OHNS.⁸ Hence, providing mentors during the diversity clerkship improves the overall rotation experience and may influence students' decision to pursue an academic career. Beyond individual mentorship, programs aimed at increasing OHNS departmental diversity would enhance mentorship and cultural competence of faculty and residents. These efforts create a welcoming educational environment for learners of diverse backgrounds, which would benefit the quality of education and care across all population segments.

Already, institutions have reported strategies with success in creating a diverse physician workforce. Deas et al.¹⁸ describes The Medical University of South Carolina systemic strategies to develop diversity within students, resident physicians, and faculty. Plans included expansion of diversity committees, institution commitments, and leadership involvement including the dean's commitment. At the college of medicine, admission evaluations added value to applicants involved in cultural experiences, serving underrepresented populations, extracurricular achievements, and overcoming adversity. Underrepresented medical students met in groups regularly with deans, mentors, and directors of programs. Additionally, programs were implemented, such as cultural competency training, a dean's annual diversity colloquium, and leadership training for women and minorities. Importantly, all clinical departments incorporated recruitment of underrepresented minorities as part of diversity plan for residency programs, including a chance for a second-look visit to meet with residents and faculty. Notably, a networking and mentoring society was created for underrepresented minority residents to develop interest in academic medicine, engage in mentorship, and further recruit new residents. Finally, a URM faculty ambassador program was initiated facilitating a meeting between current URM faculty and

potential recruits. As Deas et al.¹⁸ discusses, the results revealed success with near doubling of underrepresented minorities of students, resident physicians, and faculty after 10 years. The success of this strategic model resulted from institutional support, with influential leaders committed to plan implementation and the diversity committee creating a strategic plan with identified timelines and financial commitment to diversity.

Our medical student clerkship initiative demonstrates similar characteristics to the aforementioned strategy, but limitations do remain. First, clerkship participants were self-selected and may already have been successful candidates for OHNS residency training. These students may have already been interested in OHNS and would have applied regardless of clerkship participation. Unfortunately, other potential clerkship candidates may have been missed with the current marketing efforts. Furthermore, URM students from economically disadvantaged backgrounds, especially those from distant medical schools, may not have been able to afford the travel expenses required to attend the clerkship. Additionally, the postclerkship survey results prove informative, but remain limited secondary to students omitting negative comments considering the potential impact on an applicant's status. Overall, the students' outcomes cannot definitively be linked to clerkship participation when considering the multitude of factors that influence career decisions and matching successfully into OHNS residency. Future initiatives should consider these limitations to improve the quality of the clerkship and measures of obtaining feedback.

CONCLUSION

Mentored clerkships for URM medical students interested in OHNS may intensify student interest in applying to OHNS residency training programs, expand the number of research opportunities, and increase student interest in academic medicine.

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