

Otolaryngology Interest Groups: A Potential Solution to the Residency Match Crisis

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Objective: To determine whether medical student Otolaryngology–Head and Neck Surgery (Oto-HNS) interest groups increase student and resident interest in the specialty and influence decisions to apply to Oto-HNS residency.

Methods: Two web-based surveys were distributed by the Division of Otolaryngology–Head and Neck Surgery at UConn Health: one to current medical students at the University of Connecticut School of Medicine and the other to current residents at Accreditation Council for Graduate Medical Education–approved otolaryngology training programs.

Results: Fifty medical students and 89 residents completed the surveys. Several components were assessed in these surveys, including factors contributing to the selection process, interest group availability, attendance of meetings, availability of otolaryngology mentors, and interest in the specialty. A majority of medical students noted that interest groups play a role in influencing their interest in a medical specialty (56%). Medical students who attended Oto-HNS interest group were more likely to consider applying for otolaryngology residency ($P < .0001$) and had improved understanding of otolaryngology than those that did not attend ($P = .0003$). Residents who attended interest group meetings were more likely to be influenced to apply to otolaryngology than those that did not attend.

Conclusion: Oto-HNS interest groups improve medical student understanding of the specialty. Medical students and residents who participated in interest groups were more likely to be influenced positively regarding the specialty than those that did not attend. Oto-HNS interest groups may foster greater interest in otolaryngology residency and offer a potential solution to the current match concerns.

Key Words: Undergraduate medical education, medical student interest group, specialty selection.

Level of Evidence: xx

INTRODUCTION

Recently, the specialty of Otolaryngology–Head and Neck Surgery (Oto-HNS) has experienced consecutive years of challenges in filling residency positions. More concerning is the downward trend in the number of applicants to our specialty.^{1,2} The reasons for this are unclear, although there is speculation about some contributory factors.¹ One of the factors that warrants serious consideration is the fact that early exposure to Oto-HNS is

lacking in the undergraduate medical education (UME).³ This is particularly true of exposure for younger medical students who typically remain undecided about specialties of interest and are eager to begin their search for an appropriate residency. Given that our specialty is small, it is unrealistic to think that our specialty will obtain significant representation within the UME curriculum. Although, it is reported that up to 25% of presenting complaints in adult primary care and up to 50% in pediatrics are Oto-HNS–related.⁴ Nonetheless, it is clear from the inability to initially fill available residency positions through the match and recent decline in residency applications, that greater exposure of students to Oto-HNS is needed to foster interest in our specialty.

Extracurricular activities, such as medical student interest groups, have been shown to cultivate early interest and understanding in medicine variety of medical specialties.^{5–8} Medical students gain exposure to nuances of specialties that they typically do not get within their curriculum. These other specialties in which interest groups are more accepted, have physician involvement, provide shadowing opportunities, and present interesting cases of specialty-specific clinical problems.^{7,8} The opportunities these groups provide ultimately offer exposure to a specialty that will potentially spark an interest in some students. Yet, while this model of providing student exposure to specialty information outside of the traditional curriculum is well-accepted, there is no literature

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TABLE I.
Respondent Demographics.

Medical Students	
Gender	
Male	24 (48%)
Female	24 (48%)
Other	2 (2%)
Total	50
Current Medical School Year	
MS1	21 (30%)
MS2	22 (44%)
MS3	13 (26%)
MS4	12 (24%)
Other	3 (6%)
Oto-HNS Residents	
Gender	
Male	58 (65%)
Female	31(35%)
Other	0 (0%)
Total	89
Current Post Graduate Year	
PGY-1	18 (20%)
PGY-2	18 (20%)
PGY-3	20 (22%)
PGY-4	16 (18%)
PGY-5	12 (13%)
Other	5 (6%)
Approximate Size of Medical School Attended	
<100	6 (7%)
100–150	19 (21%)
150–200	32 (36%)
>200	32 (36%)
Geographic Location of Medical School Attended	
New England	5 (6%)
Mid-Atlantic	18 (20%)
Southwest	12 (14%)
South	19 (22%)
West	10 (11%)
Midwest	24 (27%)

MS = medical student; PGY = post-graduate year.

regarding the impact of Oto-HNS interest groups on students or residents.

At the University of Connecticut, an Oto-HNS interest group has existed for more than 5 years now. The mission of our interest group has been to foster interest in Oto-HNS,⁹ which we felt would help increase student exposure and encourage involvement within our specialty. This coincides with what Chang suggests as a way to reverse match trends.¹ Our interest group organizes regularly scheduled meetings with student, resident, and faculty staff participation that exposes students to various aspects of the specialty. Meetings often include presentations of interesting pathology, procedures, the experience of residency, and opportunities for student involvement including faculty-

TABLE II.

Medical Student Responses to Questions 8, 9, and 11 on Survey that Asks About Their Understanding of Oto-HNS and the Role of Interest Groups and the Consideration in Applying to Oto-HNS Residency.

Oto-HNS Interest Group Influence	Attendees (%) N = 19	Did not attend (%) n = 31	P-value
Understanding of Oto-HNS prior to medical school			.6133
Not at all aware	7 (37%)	8 (26%)	
Slightly aware	6 (32%)	12 (39%)	
Somewhat aware	4 (21%)	7 (23%)	
Very aware	1 (5%)	4 (13%)	
Extremely aware	1 (5%)	0 (0%)	
Current understanding of Oto-HNS			.0003
Not at all aware	0 (0%)	0 (0%)	
Slightly aware	0 (0%)	7 (23%)	
Somewhat aware	2 (12%)	16 (52%)	
Very aware	10 (59%)	6 (19%)	
Extremely aware	5 (29%)	2 (6%)	
Considering applying for Oto-HNS residency			<.0001
Extremely unlikely	1 (5%)	20 (65%)	
Unlikely	2 (11%)	7 (23%)	
Neutral	10 (53%)	4 (13%)	
Likely	4 (21%)	0 (0%)	
Extremely likely	2 (11%)	0 (0%)	

driven research and mentorship. Discussion is geared away from presenting ourselves as “elitist” and discouraging students from applying.¹ Ultimately, as interest within the student body grew, a formal extracurricular “curriculum” was created for the University of Connecticut Oto-HNS interest group. Anecdotally, we have witnessed a surge of interest in Oto-HNS from the small medical student body of about 80 to 100 students per year. Our institution recognized the value of this interest group and wanted to evaluate its effect on our institution and compare it to the impact it has had nationally. As such, in this work, we surveyed current medical students at the University of Connecticut School of Medicine and Oto-HNS residents at Accreditation Council for Graduate Medical Education (ACGME)-accredited residency programs and assessed the influence that Oto-HNS interest groups had on medical student and residents. We feel that this work offers timely information that may provide a potential solution to the recent trends in the Oto-HNS match.

METHODS

Survey Distribution

Institutional Review Board (IRB) approval was obtained from our institution for this study (Protocol #:17-003-2). Two anonymous, secured, web-based surveys were developed through SurveyMonkey.com. One survey was designed for medical students at our institution and

Are you Considering Applying to Oto-HNS Residency?

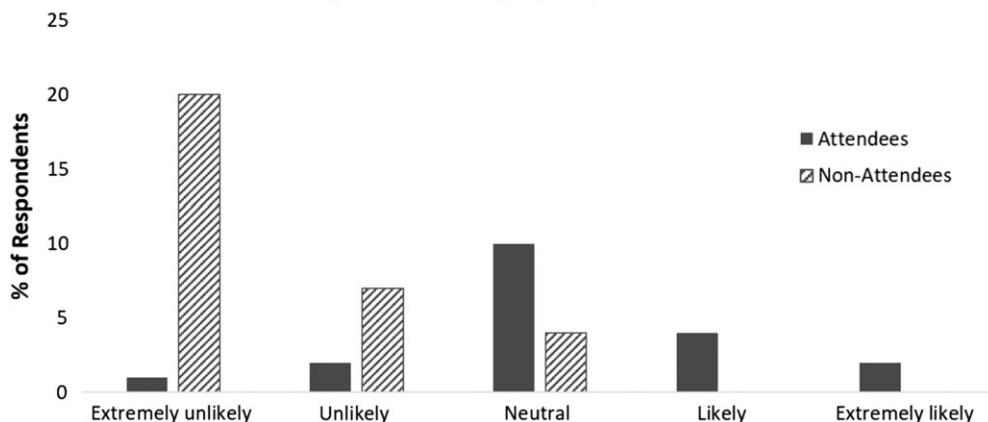


Fig. 1. Medical Student Responses to question 11 of the survey. The difference in consideration of applying for Oto-HNS residency between attendees of Oto-HNS interest groups and those that did not attend was significantly different ($P < .0001$). Note that first year medical students were excluded because the survey was distributed early in the academic year, and they would not have had adequate experience necessary to fully answer this question.

the other for Oto-HNS residents. Several components were assessed in these surveys, including factors contributing to the selection process, interest group availability, involvement and attendance of meetings, availability of otolaryngology mentors, and understanding of the specialty. The student and resident surveys were composed of 11 and 12 questions, respectively (see supplemental Appendix I and II). Five-point Likert scale questions were used in these surveys as a validated survey method. The email addresses of each program director and residency program coordinator at all ACGME accredited Oto-HNS programs were obtained through the FRIEDA online database. Surveys were disseminated via email to current medical students at the University of Connecticut School of Medicine as well as to residency program directors and coordinators for distribution to current residents. The timing of survey collection was early within the academic year. Thus, first-year medical students were excluded from the study due to limited ability to attend interest group meetings. A reminder email containing the individual survey was redistributed 2 weeks after the initial dissemination. After 4 weeks, each survey was closed and the data was extracted for analysis.

Statistical Analysis

Statistical analysis was performed using R 3.3.0 (Vienna, Austria). The medical student and resident data were analyzed separately. Descriptive and association analyses (Fisher's exact test) were performed. For both the student and resident surveys, respondents who attended interest group meetings were compared with those who did not. These two-group comparisons were carried out by Fisher's exact test. All tests were two-tailed and statistical significance was defined as a P value $< .05$.

RESULTS

From our institutional study, 50 of 240 students (MS2-MS4) responded. Twenty-four (48%) of student

respondents were male. Of the respondents, 19 (38%) had attended an Oto-HNS interest group meeting. Student respondents were evenly distributed throughout the second to fourth year of UME training. Eighty-nine Oto-HNS residents responded, of which 58 (65%) were male. Of the resident respondents, 45 (50%) had attended Oto-HNS interest group meetings as students. Resident respondents were nearly evenly distributed throughout post-graduate training year and geographic location. Respondent demographics are shown in Table I.

Within our institutional cohort of students, there were more students who noted improved awareness and understanding of Oto-HNS after attending interest group meetings compared to those that did not ($P = .0003$) (Table II). Similarly, the students who attended the interest group meetings indicated that they were more likely to apply to Oto-HNS residency compared to those that

TABLE III.

Resident Responses to Questions 9 and 11 on Survey that Asks About the Influence of Interest Groups in Their Decision to Apply for Oto-HNS Residency and How It Influenced Their Understanding of Oto-HNS. Only Those Residents that Attended Interest Group Meetings as Medical Students Are Included (45 of 89 Total Responses).

Oto-HNS Interest Group Influence	Attendees (%) N = 45
Decision to apply to residency	
Not at all influential	13 (29%)
Slightly influential	15 (33%)
Somewhat influential	11 (24%)
Very influential	3 (7%)
Extremely influential	3 (7%)
Understanding of otolaryngology	
Not at all influential	7 (16%)
Slightly influential	16 (36%)
Somewhat influential	10 (22%)
Very influential	9 (20%)
Extremely influential	3 (7%)

Factors that Influenced Students Interest in a Medical Specialty

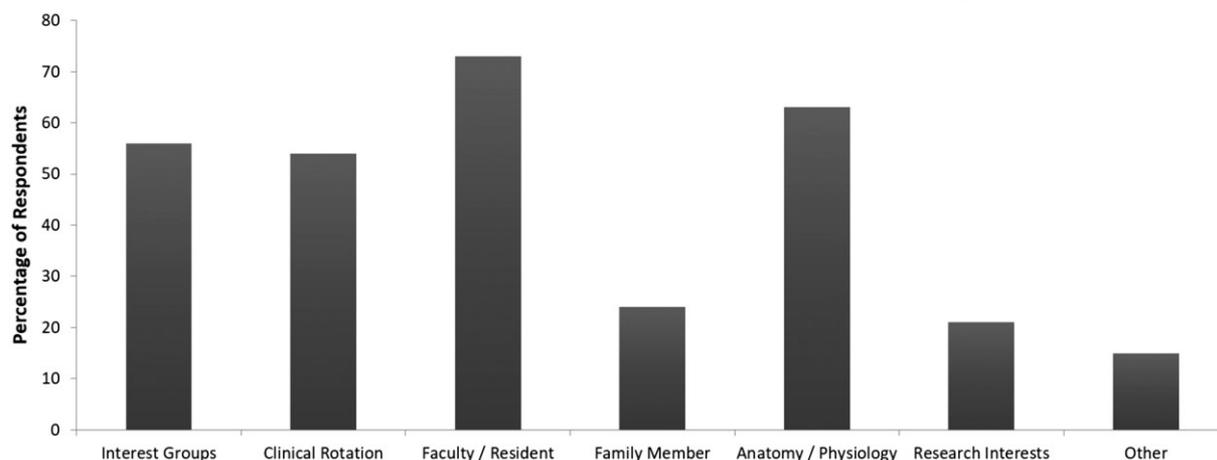


Fig. 2. Medical student responses to question 3 of the survey. Interest groups contributed to influencing interest in a medical specialty in 56% of respondents. Other important factors that influence a decision to consider a medical specialty is faculty interaction (73%), anatomy/physiology (63%), and clinical rotations (54%). Note that first year medical students were excluded because the survey was distributed early in the academic year, and they would not have had adequate experience necessary to fully answer this question.

did not ($p < .0001$) (Table II and Fig. 1). Of Oto-HNS residents who attended interest group meetings, the majority indicated that Oto-HNS interest groups were at least slightly influential in improving the understanding of Oto-HNS (84%) and influencing their decision to apply to the specialty (71%) (Table III).

Medical students noted that interest groups were one of the factors that influenced interest in a particular specialty (56% of respondents). Additional factors that both students found influential in their decision to pursue a specialty include faculty and resident interactions (73%), anatomy and physiology of the head and neck (63%), and clinical rotations (54%) (Fig. 2).

DISCUSSION

As a specialty, Oto-HNS has experienced concerning trends in the residency match process.^{1,2} While, there are a number of potential contributing factors that underlie this issue, there are specific factors that we, as a specialty, can control in regards to this issue. Specifically, we can offer improved exposure of Oto-HNS to medical students as a means to introduce students to a specialty that has a limited role within the current UME. Within the literature, interest groups have provided introductions to medical specialties, opening doors for increased medical student contact with faculty and resident mentors, research opportunities, and clinical electives.⁴⁻⁸ Yet, this concept had not been explored within Oto-HNS. Here, we provide the first results that suggest Oto-HNS interest groups may offer one option for improving exposure among medical students and offer a potential mechanism by which our specialty can reverse the recent residency match concerns.

Our survey-based study assessed the impact of medical school Oto-HNS interest groups in improving exposure to the specialty and evaluated the effect of its impact in the decision to apply to Oto-HNS residency. Our data

demonstrate that an Oto-HNS interest group can positively influence medical students who attend these extra-curricular meetings. This is clear from the fact that students at our institution who attended meetings are more likely to consider applying to the specialty compared to those who have not attended. Similarly, the residency respondent data showed that a majority of residents felt that Oto-HNS interest groups were at least “slightly influential” in their decision to apply to the specialty.

A majority of medical students reported having little awareness of Oto-HNS as a specialty prior to medical school, independent of whether they later attended interest group meetings. Medical student awareness/understanding of otolaryngology at the time the survey was distributed, however, showed a statistically significant increase when comparing those that had attended Oto-HNS interest group meetings to those that had not. This suggests that the Oto-HNS interest group at our institution is a powerful resource to increase the awareness and understanding of Oto-HNS among students. Although we report single institution results, if generalizable, the impact can be enormous. This finding suggests that interest groups may increase the likelihood of applying to an otolaryngology residency by simply increasing awareness of this specialty for students. This is one of the reasons that early exposure for junior medical students is important because earlier awareness of a specialty offers opportunity to explore the specialty, which we anticipate will increase the number of applications for residency.

It has been suggested that the reduction in applications is partly a consequence of the intentional attempt of the specialty to do so. For example, a separate paragraph explaining an applicant's specific interest in a program was aimed at preventing a shotgun approach to the application process.^{10,11} Additionally, an optional talent assessment interview was offered in addition to program specific interviews.¹² Some feel that this made the

application process discouraging, which created a negative perception of our specialty leading to the unintended consequence of too few applications.¹¹ The intent with Oto-HNS interest groups is to offer encouraging advice, which is a necessary counter to the shadow that exists currently. At our institution, our intent is not to coax every student who attends meetings to apply to the residency. Rather, we aim to expose students to the specialty and let their interest lead them. Our faculty and residents, encourage students to get involved if they are interested without external pressures to “prove” their interest. We feel that this open approach allows interested students to apply without discouraging students who may be intimidated by the process. Anecdotally, this approach has been successful, as many students have voluntarily reached out for opportunities to get involved clinically as well as in otolaryngology specific research. We hope that future work will specifically evaluate the medical or surgical specialty that students who attend Oto-HNS interest groups apply to. This information should be the subject of future work to further understand the role of Oto-HNS interest groups within the larger context of residency applications.

It is worth noting that our data suggested that Oto-HNS interest groups function best as an adjunct to other factors that are important in influencing applicants to apply for Oto-HNS. Current residents noted that faculty/resident interactions and clinical rotations played important roles in influencing their decision to apply to Oto-HNS. Our institution’s model of the interest group is a student-run group that invites faculty and residents as mentors and resources. We feel that mentorship and availability outside of the clinical setting and work environment introduces non-judgmental mentorship without perceived stresses of needing to perform and impress senior faculty. Studies have demonstrated that mentorship does impact medical students’ decision to pursue a specialty.¹³ In fact, in one study, interaction with residents and faculty mentors was the most influential factor for medical students in the process of choosing Oto-HNS as a residency.¹⁴ This previous work is consistent with our findings.

The results of this study need to be interpreted in light of several limitations. Response rates for the survey were low for both medical students (21%) and Oto-HNS residents (~6% based on estimated total number of residents in all ACGME programs). Despite low response rates, respondents were distributed evenly amongst year of training and gender. Furthermore, Oto-HNS resident respondents came from a well distributed number of medical schools in terms of geographical location and size. Finally, there were similar numbers of respondents who attended and did not attend Oto-HNS interest group meetings, which provides reasonable grounds for comparison of the groups despite a small sample size. Additionally, while we demonstrate that the interest group had a positive influence on the students, there are factors that we did not evaluate which could influence the students to attend the interest group meetings. For example, there is the possibility that some of the students who attended the meeting had prior exposure to otolaryngology.

Repeating the study with tactics to increase survey response rate and asking more question regarding student motives to attend the interest group may be considered. Possibilities to help execute these next steps include garnering the support from the Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) to include the survey in Academy sponsored publications or at the Section for Residents and Fellows (SRF) at the Annual Academy Meeting to increase response rates and improve external validity. Given the heightened awareness of concern, we hope that individual programs consider the importance of future surveys that evaluate ways to improve our specialty.

The downward trend in Oto-HNS applications is relatively unexpected, considering that just a few years ago, the specialty was one of the more competitive specialties.¹¹ However, just prior to these current match concerns, Kaplan et al. suggested that there were inconsistencies in students and residency program director expectations about the specialty and application process.¹⁵ It was suggested that “... Otolaryngologists tend to be viewed as a distinctive group of physicians who love what they do, are exceptionally collegial, and tend to be humanistic.”¹⁵ We concur with this statement, and use our Oto-HNS interest group as the forum for displaying these characteristics. As our data demonstrate, faculty interaction plays an important role in influencing the decision to apply for residency also, and the meetings we organize positively represent our specialty and individuals within the specialty. We recognize that mentorship along with an interest is important in changing the current environment with the Oto-HNS match,¹⁶ and we use our Oto-HNS interest group as a way to expose students to a great specialty and offer non-judgmental support and opportunities with mentors in our program.

While it is unlikely that a single factor will be identified as the cause of the application trends in Oto-HNS, we feel that Oto-HNS interest groups may have potential to offer a simple, comprehensive solution. By improving exposure and awareness of the specialty to medical students, there is potential for more meaningful interactions with otolaryngologists. These interactions may lead to mentorship that can be a foundation for a successful application. Ultimately, our pilot data suggest that supporting and sustaining robust Oto-HNS interest groups may help bolster interest in our specialty and lead to an increase in the number of competitive applicants applying to otolaryngology residency programs.

BIBLIOGRAPHY

1. Chang CWD. Match 2017: blindsided or fumbled? *Otolaryngol Head Neck Surg* 2018;158(4):594–597.
2. Hamaker A. Is there a crisis in the otolaryngology match? *ENTtoday*. 2018; June 11.
3. Wong A, Fung K. Otolaryngology in undergraduate medical education. *J Otolaryngol Head Neck Surg* 2009;38(1):38–48.
4. Donnelly MJ, Quraishi MS, McShane DP. ENT and general practice: a study of paediatric ENT problems seen in general practice and recommendations for general practitioner training in ENT in Ireland. *Ir J Med Sci* 1995;164(3):209–211.
5. Fricke BB, Gunderman RB. Creating and enhancing radiology student interest groups. *Acad Radiol* 2010;17(12):1567–1569.
6. Kost A, Cawse-Lucas J, Evans DV, Overstreet F, Andrilla CH, Dobie S. Medical student participation in family medicine department extracurricular

- experiences and choosing to become a family physician. *Fam Med* 2015; 47(10):763–769.
7. Agarwal A, Shah A, Byler S, Hirsch AE. Cultivating interest in oncology through a medical student oncology society. *J Cancer Educ* 2017;32(1):31–34.
 8. Pitre CJ. The unique educational value of emergency medicine student interest groups. *J Emerg Med* 2002;22(4):427–428.
 9. Naples J. Fostering interest without intimidation in otolaryngology. *Otolaryngol Head Neck Surg* 2018;159(2):398.
 10. Puscas L, Esclamado R. Use of a Secondary Essay in the Residency Application Process. *JAMA Otolaryngol Head Neck Surg.* 2015;141(7):591–592.
 11. Salehi PP, Benito D, Michaelides E. A novel approach to the national resident matching program-The Star System. *JAMA Otolaryngol Head Neck Surg* 2018;144(5):397–398.
 12. Otolaryngology Resident Talent Assessment. <https://orta.leadthedifference.com/portal/td/ortaAssessment/>. 2017.
 13. Straus SE, Straus C, Tzanetos K, International Campaign to Revitalize Academic M. Career choice in academic medicine: systematic review. *J Gen Intern Med* 2006;21(12):1222–1229.
 14. McCaffrey JC. Medical student selection of otolaryngology-head and neck surgery as a specialty: influences and attitudes. *Otolaryngol Head Neck Surg* 2005;133(6):825–830.
 15. Kaplan AB, Riedy KN, Grundfast KM. Increasing competitiveness for an otolaryngology residency: where we are and concerns about the future. *Otolaryngol Head Neck Surg* 2015;153(5):699-701.
 16. Chang CWD. Mindful mentoring. *Otolaryngol Head Neck Surg* 2018;159(2): 398–399.