



# Catching the ear of medical students through otolaryngology surgical simulations

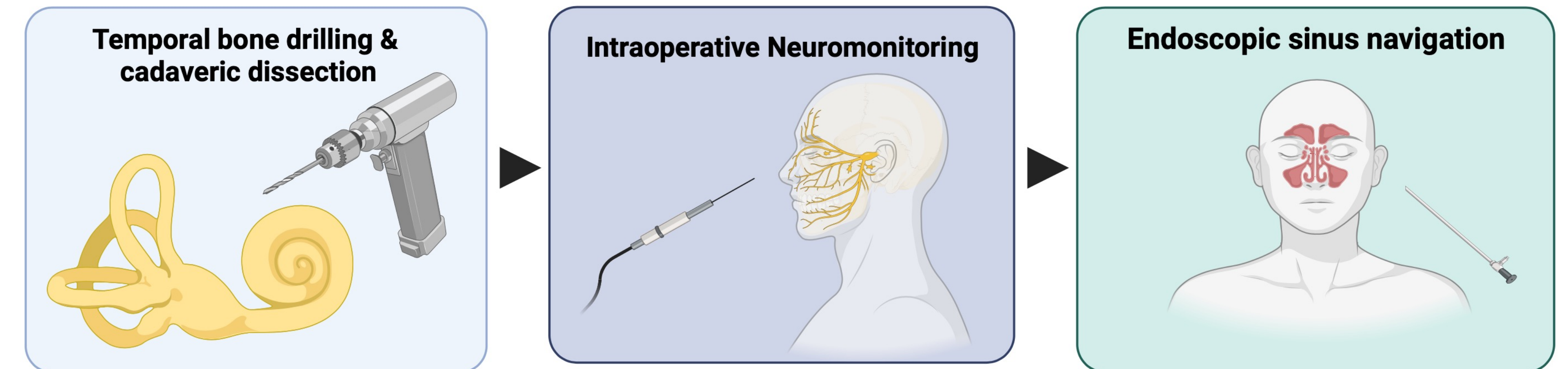
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## BACKGROUND & OBJECTIVES

- There is increasing evidence that surgical simulations may be broadly applied to recruit interest into subspecialty programs, even among medical students naive to surgical training.<sup>1-4</sup>
- We hypothesized that offering early exposure to ENT simulations experiences can enhance medical student engagement with the field of otolaryngology and may influence career discernment.

Here we report on our experience piloting a two-hour simulation experience facilitated by ENT faculty, fellows, residents, and medical device experts offered to first through third year medical students and sought to understand its impact on subspecialty interest

## METHODOLOGY

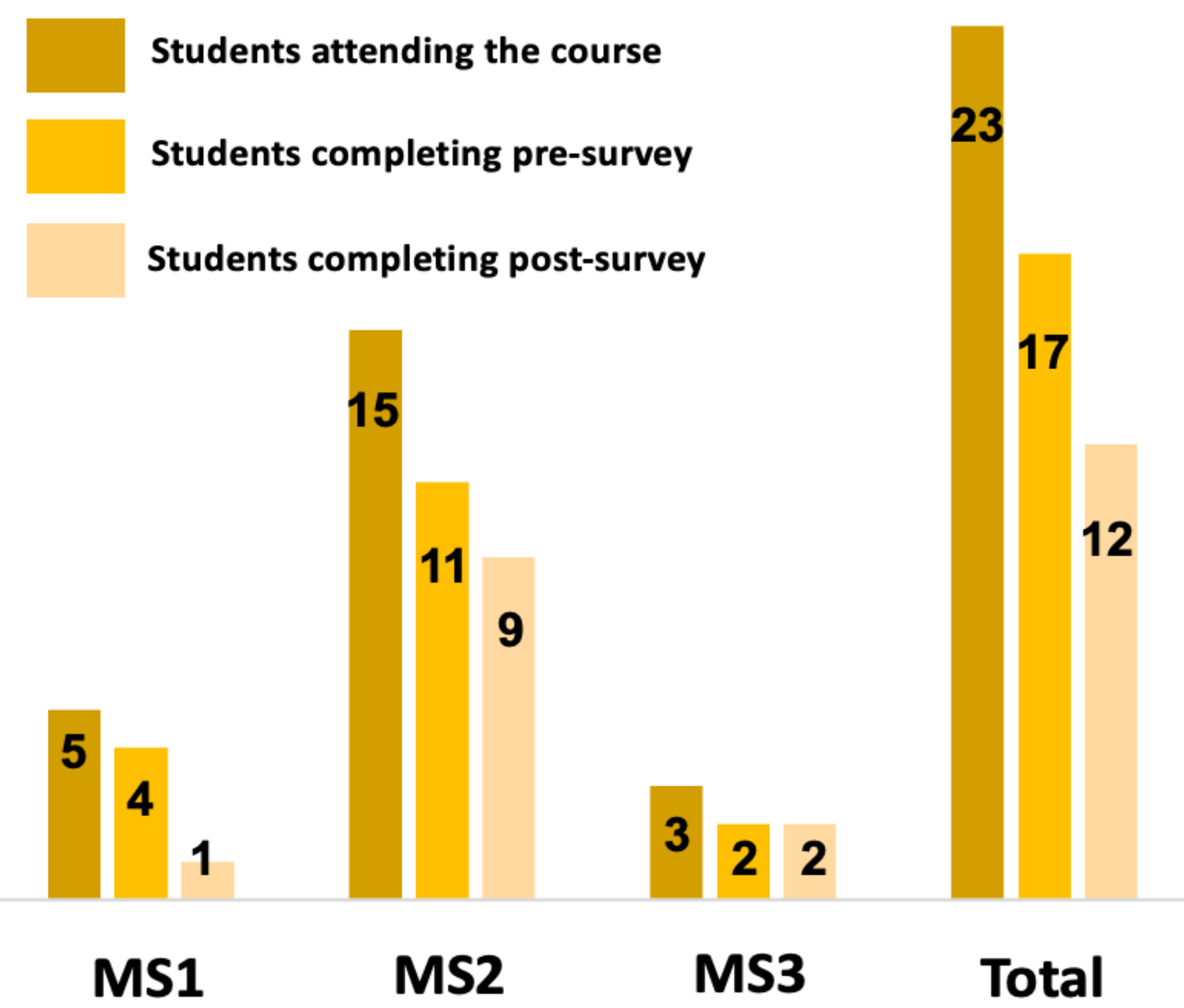


**Figure 1: Simulation course curriculum.** The course included student rotation through three stations with 20 minutes spent at each station, 1) temporal bone drilling through cadaveric dissection, 2) intraoperative neuromonitoring, and 3) endoscopic sinus surgery navigation. Image created with Biorender.com

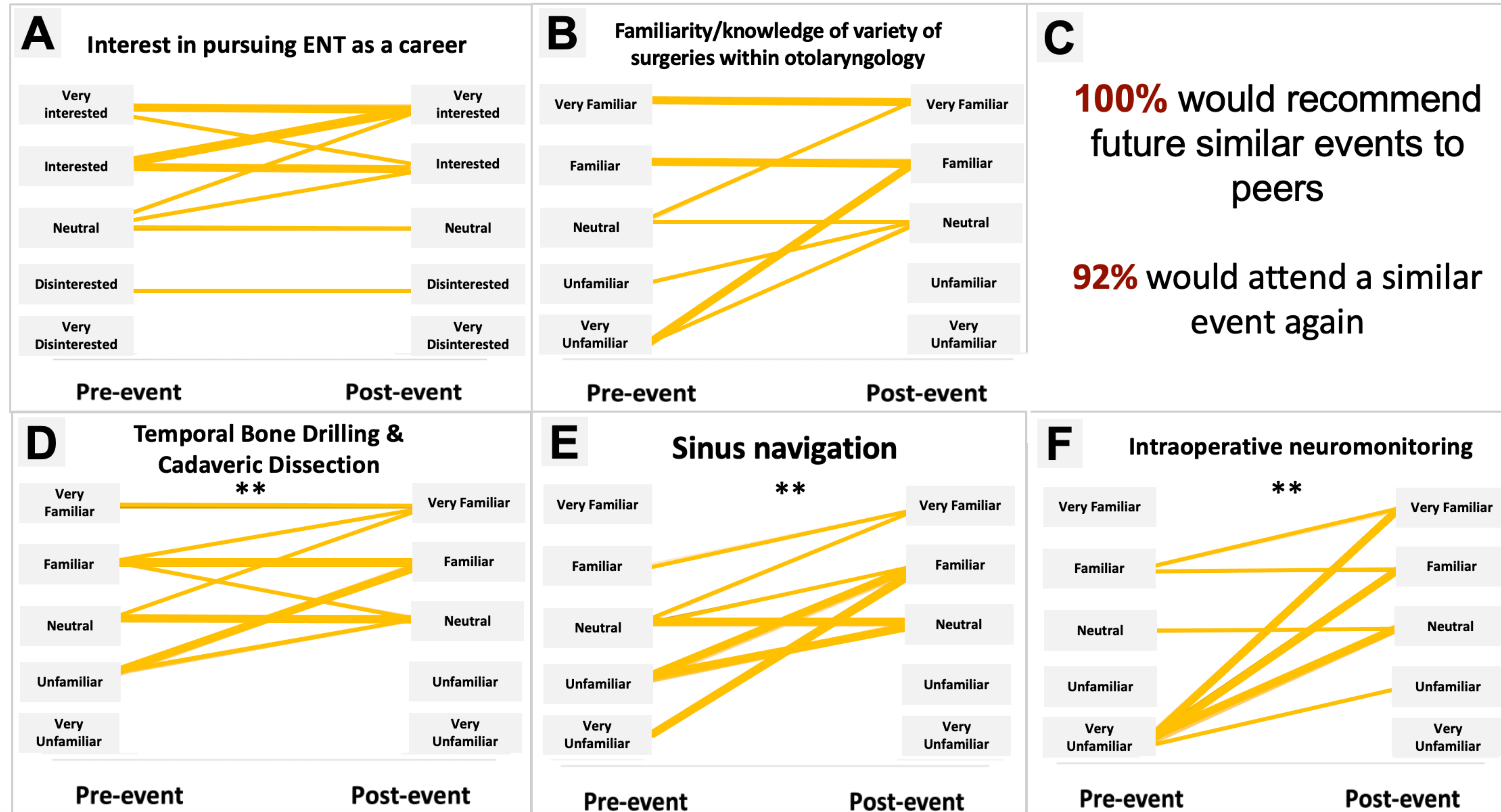
- Students were offered dinner at the beginning of the session and were able to network with physicians and industry representatives before and after the session.
- Pre- and post-session anonymous surveys with Likert-scale questions were obtained (deemed IRB exempt) and evaluated with paired Wilcoxon Signed-Rank tests ( $p < 0.05$  deemed significant).
- Qualitative responses were evaluated with inductive coding methods.

## RESULTS

### Medical school year of participants



**Figure 2: Medical school year for attendees and survey respondents.** >60 students responded to initial RSVP for attendance. MS2 and MS3s interested were prioritized in being allocated a spot. 22% of students attending the event were first year medical students (MS1), 65% were second year medical students (MS2), and 13% were third year medical students (MS3) (n=23).



**Figure 3 Panel A:** Pre-event (n=17), 71% rated they were 'Interested' or 'Very Interested' in pursuing ENT as a career. Post-event (n=12), 33% responded with a higher score for interest in pursuing the specialty ( $p = 0.20$ ). **Panel B:** Pre-event 47% rated themselves as either "familiar" or "very familiar" with the variety of surgery types performed by otolaryngologists. Post-event (n=12), 42% reported increased familiarity ( $p = 0.06$ ). **Panel C:** 100% of respondents in the post-survey stated they would recommend a future similar event to peers and 92% stated they would attend a similar event again. **Panel D-F:** Self-reported knowledge significantly increased regarding temporal bone procedures ( $p=0.005$ ), endoscopic sinus navigation ( $p=0.006$ ), and intraoperative neuromonitoring ( $p=0.005$ ). **Each line represents one respondent, the bolder lines signify two or three respondents with identical responses. \*  $p < 0.05$ , \*\*  $p < 0.01$**

- Enjoyed/found beneficial:**
- Hands-on activities, especially temporal bone drilling and sinus navigation
  - Learning from experts in the field
  - Session's interdisciplinary nature

- Opportunities for growth:**
- Group anatomy review prior to sessions may further enhance learning
  - There is a desire to better hone physical exam skills in addition to learning about surgical techniques
  - Working with residents and fellows in addition to faculty is helpful and desired

**Figure 4: Themes emerging from survey respondents' qualitative feedback.** Positive responses included appreciation of hands on and interdisciplinary nature and interfacing with experts in the field. Students identified multiple areas for growth within these sessions. Figure created with Biorender.com

## CONCLUSIONS & FUTURE DIRECTIONS

- High baseline interest and significant increases in self-reported knowledge was demonstrated across multiple otolaryngology operative concepts during this simulation activity. This is consistent with similar reports from both within otolaryngology and other surgical fields.<sup>1-3</sup>
- In its preliminary success, we conclude this approach to be **feasible** and relatively **inexpensive** with **measured benefits**.
- Diversification of the surgical workforce to include students with identities historically underrepresented in medicine and surgery is pertinent to improving patient health outcomes rooted in systemic biases and reducing workforce discrimination. We hope to evaluate how efforts aimed at earlier exposure of surgical subspecialties may impact justice, equity, diversity, and inclusion initiatives in the field.
- We are also interested in discerning how participation in this type of course may influence specialty application and could investigate this through examining attendee match data.

## ACKNOWLEDGMENTS & REFERENCES

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- We wish to thank the Medtronic device representatives at the University of Minnesota for their time and provision of navigation and neuromonitoring equipment.

[1] George, J. et al. Winning Hearts and Minds: Inspiring Medical Students into Cardiothoracic Surgery Through Highly Interactive Workshops. *Journal of Surgical Education* 74, 372–376 (2017).  
 [2] Spiers, H. et al. Augmenting ENT surgery outside the medical school curriculum: the role of a 1-day otolaryngology course. *The Journal of Laryngology & Otology* 133, 269–274 (2019).  
 [3] Arwyn-Jones, J. et al. <p>Specialty Showcase Days: Can Specialist Careers Workshops Improve The Consideration Of ENT For Medical Students?</p>. *AMEP* 10, 877–884 (2019).  
 [4] Patel, B., Saeed, S. R. & Smith, S. The provision of ENT teaching in the undergraduate medical curriculum: a review and recommendations. *The Journal of Laryngology & Otology* 135, 610–615 (2021).