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Regionalization of ORL Boot Camps: Report of the Society of University Otolaryngologists Task Force

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Objectives: Simulation-based boot camps have emerged as timely vehicles to help novice residents develop the skills needed to manage medical emergencies. Geographically regional boot camps provide opportunities for interaction between residents and faculty from multiple otolaryngology programs. The Society of University Otolaryngologists (SUO) Boot Camp Task Force investigated the concept of regional access to otolaryngology boot camps with the goal of making more regional boot camps available for otolaryngology residents across the United States.

Study Design: Interviews.

Methods: The SUO Boot Camp Task Force assessed regional access to otolaryngology boot camps with a focus on geographic distribution, curricular content, and finances. Boot camp directors were contacted by email and telephone and interviewed to elicit information on all these areas.

Results: Data were available from 10 known regional simulation-based boot camps designed for novice residents. Individual boot camps included from 12 to 30 residents and 10 to 50 faculty members. Curricula included both technical (ie, procedural) and non-technical (eg, communication, leadership) skills for individuals and teams. Content was heavily weighted toward a variety of airway problems and management techniques, although various conditions involving hemorrhage, and airway fires were also addressed. Funding and expense structures had the greatest variability.

Conclusions: Considerable variability was identified among the known regional boot camps in terms of numbers of participants and finances, but fewer differences in curriculum. Geographic opportunity for 9 to 10 new boot camps was identified. The SUO Task Force recommends that a consensus be developed for several individual skill and teamwork scenario objectives to be included in each boot camp.

Key Words: Boot camp, simulation, education, otolaryngology, residency, curriculum, finances.

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INTRODUCTION

Novice surgical trainees enter residency faced with a number of immediate challenges. They lack many of the technical and non-technical skills, as well as confidence, needed to manage routine or emergent clinical situations. In some circumstances, novice residents must be able to perform life-saving procedures on actual patients promptly and correctly even before senior assistance is available.[1] Commencement of "on-call" duties is often accompanied by understandable anxiety. Residents' concerns are justified by evidence that suggests reduced efficiency and increased mortality in hospitals at the start of the academic year, otherwise known as the "July effect."[2,3] Surgical educators have called for training to be provided before or early in clinical residency, suggesting simulation plays a vital role in preparing residents with appropriate knowledge, skills, and behaviors to provide safe care to patients.[4,5] The value of incorporating simulation into education for medical students, residents and fellows, and practicing otolaryngologists is evidenced by its acceptance by the American Association of Medical Colleges,[6] the Accreditation Council for Graduate Medical Education,[7] and the Accreditation Council for Continuing Medical Education.[8] Specific to otolaryngology, simulation has been shown to improve patient care and outcomes.[1,9] Jabbour and Snyderman address the complex considerations involved in cost–benefit analyses;[10] the anticipated benefits are sufficient to justify investment in

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simulation resources by the Controlled Risk Insurance Company (CRICO)[11] as well as many healthcare organizations.

While many otolaryngology residency programs have incorporated simulation-based education into their residency curricula, the concentrated boot camp format offers a distinct educational opportunity. Boot camps have been developed as one method to rapidly provide opportunities to practice a variety of skills that may be needed early in residency. Simulation-based boot camps provide a hands-on experience in technical and non-technical specialty-specific skills in a concentrated 1- to 2-day format. Introductory boot camps have been described as transition courses for novice residents in various surgical specialties including orthopedic surgery,[12,13] neurosurgery,[14,15] trauma surgery,[16] general surgery,[17] and cardiothoracic surgery.[18] These surgical subspecialties have created standard boot camp curricula addressing their disciplines' specific technical and cognitive skills with an aim to support rapid development of basic skills. Neurosurgery has also adopted a regionalization strategy to provide maximal access for learners and to create economies of scale for faculty, simulation assets, and organizational effort. Their model includes both post-graduate year (PGY) 1 and PGY2 regional boot camps, supported by industry grants that cover travel expenses and honoraria for faculty, as well as travel for residents. Regionalizing novice surgical boot camps around a common national curriculum allows every novice US neurosurgical resident to experience this opportunity for early acquisition of basic skills.

In otolaryngology, the first named regional novice-learner simulation-based boot camp was developed and implemented in 2010.[19–22] Although this boot camp included learners and faculty from several cities, a boot camp would be considered "regional" if it included learners and faculty from multiple otolaryngology programs, even if they are in the same city. Many others have been established across the US and in Canada in the subsequent decade. These Otolaryngology boot camps are highly valued by residents and also provide benefits for faculty.[1,19,23,24] Although there are many similarities between the boot camps, there is variation in both the curriculum and the simulations that comprise the boot camps. While these boot camps have expanded access for otolaryngology residents across the country, not every member of the otolaryngology resident cohort has the opportunity to participate in these courses during their training.[7]

In January 2018, the Society of University Otolaryngologists (SUO) assembled a Boot Camp Task Force to investigate the concept of regional access to otolaryngology boot camps. The task force was charged with developing a proposal for regionalization of simulation-based boot camps that:

1. Is cost-effective, feasible, and provides the widest coverage of US learners;
2. Optimizes the core curriculum for best educational outcomes; and
3. Outlines budget considerations for financial analysis.

Three Task Force subcommittees were formed to further explore:

1. The current landscape of otolaryngology boot camps;
2. A structured and standardized curriculum; and
3. Resource and financial considerations.

Herein we describe the process, findings, and recommendations of the task force and propose next steps towards a national consortium of regional otolaryngology simulation-based boot camps.

Based on the personal knowledge of all members of the Task Force, the following multi-institutional regional (or regional-ready) boot camps with general content for novice otolaryngology residents were identified:

- University of California at Davis
- ORL Emergencies Boot Camp (Georgetown University/ Children's Hospital of Philadelphia/ University of Pennsylvania/University of Michigan/University of Maryland)
- University of Michigan
- Montefiore Medical Center of the Albert Einstein College of Medicine
- Midwest Otolaryngology Simulation Training (Washington University, St. Louis University, University of Missouri, Columbia)
- Children's Hospital of Philadelphia Pediatric Airway Endoscopy Foreign Body Course
- Duke University
- Case Western University
- Western University (Ontario, Canada)
- Boston Children's Hospital

Location, curricula and finance data were obtained by reviewing course curricula and contacting boot camp directors by email and telephone. Note that one boot camp is located outside of the US and one has a specialized focus; three did not provide financial details. While Task Force members are geographically diverse, there is no central registry of regional boot camps and there may be additional regional boot camps that were not identified.

Current Landscape

In 2018, the eight US regional (or regional-ready) boot camps with general curricula were located in the following regions: three in the Northeast (Baltimore/Washington, DC, area; Boston, MA; New York, NY), three in the Midwest (Ann Arbor, MI; Cleveland, OH; St. Louis, MO), one in the Southeast (Durham, NC) one on the West coast (Davis, CA) (Fig. 1). Currently, novice otolaryngology boot camps exist in two formats. The first is the regional boot camp that includes both learners and faculty from a number of otolaryngology programs, typically within the same geographical region; these often are sponsored by more than one academic institution with course directors from different programs, and most rely on faculty from different institutions to support the teaching requirements of the course. The second model is the single-institution boot camp that is housed within a single otolaryngology department and provides this educational experience to a smaller group of local residents; these boot camps may include medical student learners, resident learners from other in-house departments (eg, emergency medicine), and advanced practice providers. The faculty for these boot

Fig. 1. Stars indicate location of regional or regional-ready novice simulation-based boot camps in the US in 2018. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

camps tend to be local and are likely to include senior residents.

The boot camp course directors were contacted by email, with ad hoc follow-up, using a list of questions addressing their capacity for learners, their faculty needs and other important operational details. Boot camps typically took place shortly after the beginning of the new academic year, most commonly in July. Most reported a ratio of one faculty to two or three learners as ideal. Nearly every boot camp director cited teaching commitments from outside visiting faculty as a requirement for a regional site, and some have considered requiring visiting programs to provide faculty in order to register their learners for the course. Although a minority of faculty come from private practice, they add important context and are always welcome. While boot camps vary in maximal learner capacity, all indicated the possibility to run a second day of the boot camp to expand access to more residents, provided that faculty, facility, and support resources remain available. Interestingly, several boot camps, such as those in Ann Arbor, Cleveland, and New York, started out as single-institution boot camps prior to expanding into successful regional programs within 1 or two years of their development. Although there is no formal structure for sharing or standardizing content, many faculty attend multiple boot camps and freely exchange curriculum and simulator ideas and processes. For example, the "It's 3 am, do you really want to call your attending" interactive panel that originated at the DC/Baltimore regional boot camp has been shared across many boot camps with content added and curated by a diverse group of boot camp course directors and faculty.

In addition to the regional boot camps, there were at least four additional single-institution boot camps operating in 2018, at the University of Washington, University of Colorado, University of Minnesota, and University of Cincinnati. Figure 1 demonstrates a distribution of boot camps that favors the Northeast and Midwest but reveals opportunity for regional boot camp expansion or development in the Southeast, West, and particularly the Southwest. Comparing this information to the relative concentrations of otolaryngology residents, the need for more boot camps in the South and West becomes obvious. For example, another West coast regional boot camp site would be better located in southern California than in San Francisco, as the Davis course and the University of Washington course are already well established for residents in the Pacific Northwest and northern California. The resident population is more widely dispersed geographically in the South and West, so thought should be given to establishing additional boot camp locations in these regions. There is a rather glaring need for boot camp opportunities in the Southwest, and the establishment of a program in Texas, possibly in airline hub cities of Dallas or Houston, could greatly improve access.

The importance of having highly engaged local leaders to create a new boot camp, even with the guidance of a national curriculum, cannot be overstated. Although large urban institutions have some logistical advantages, energy, institutional commitment, and simulation infrastructure have been critical to the success of every established boot camp to date; these assets may well be located in smaller cities or institutions. Similarly, the task force would caution against efforts to "relocate" well-established regional boot camps (eg, from Ann Arbor/Detroit to Chicago, or Davis to San Francisco), as the start-up costs in terms of time, energy, and finances are significant, and we have not encountered a compelling rationale with respect to access or ease that would support such a move.

Recommendations:

- Establish nine or 10 regional boot camps offered over multiple dates to provide access to the boot camp experience for every ORL resident.

    1. Expand existing boot camps to accommodate more residents

2. Develop new boot camps in the Southeast and Southwest to improve geographic regional access
3. Offer boot camps on staggered, coordinated dates so that individual programs could send their residents to a boot camp without compromising their home program operations.

- Administrative support to successfully implement this proposal, including coordinating dates, registration, and resident and faculty participation
- Develop a mechanism to provide faculty with academic credit for boot camp development and participation

Curricular Considerations

Information was obtained from 10 simulation-based boot camps to determine which individual skills and teamwork scenario simulations are currently provided, as well as the general logistics of boot camp structures.

Skills stations. Skills stations provide novice residents with opportunities to develop their own technical (procedural) and non-technical skills. Figure 2 shows which skills for individuals are the most consistently presented in the surveyed boot camps; the top six skills are highlighted. Although there was substantial overlap in the type of skill being taught, the simulation modalities and specific simulators used to accomplish these skills varied from program to program. For example, the same skill of cricothyrotomy could be practiced on a variety of simulators, including full-body adult manikins or explanted pig larynges covered in fabric or covered with silicone skin. In addition to task trainers and full-body manikins, some boot camps had access to harvested animal parts, anesthetized animals, or cadavers. Regardless of the simulation modality, the skills that were offered the most frequently align well with the skills that program directors indicated should be prioritized, based on the 2017 SUO Program Director Survey.[25]

Teamwork scenarios. Many of the surveyed programs also incorporated teamwork scenarios, which provided opportunities for residents to use their individual skills (eg, accomplish a surgical airway) in a simulated patient care scenario that also required coordinating a team response to a medical condition (eg, manage a patient with airway obstruction from angioedema). These scenarios allow residents to integrate technical and non-technical skills into more holistic and comprehensive simulated patient care experiences. Scenarios involving teams also provided an opportunity for residents to develop interpersonal, communication and professionalism skills. Figure 3 shows the teamwork skill scenarios most commonly provided.

Boot camp logistics. Most programs (eight of 10) lasted for 1 day; one additional program was interested in converting to a 1-day activity. Most of the boot camps (n = 6) were on a Saturday. Most programs used a "round robin" approach (vs. progressing from easier to more difficult activities) to allow residents to participate in each station. Residents were divided into small groups, typically consisting of four to six residents per group. Some boot camps utilized duplicate simultaneous stations to accommodate larger numbers of residents. Faculty orientation may occur the evening prior or by email. As many of the skills included in the boot camps are specialized and unique to otolaryngology, simulation centers require guidance about how to adapt existing resources or create

Individual skills	Number of Programs
Surgical airway	8
Fiberoptic Laryngoscopy/Intubation	8
Basic Airway (BMV, OP/NP Airway, Intubation)	7
"Build a Bronch"	7
Direct laryngoscopy	7
Epistaxis control	7
Complex soft tissue injury/local flaps	5
Airway foreign body removal	5
Auricular hematoma	4
Lateral canthotomy	3
Difficult conversations	3
Decision-making	3
Facial trauma (bones)	3
Peri-tonsillar abscess I&D	2
Ear foreign body removal	2
Myringotomy	2
Laryngeal suturing	2
Nasal endoscopy	2
Nasal bone fracture reduction	1

Fig. 2. The skills for individuals provided during regional novice simulation-based boot camps, in order of frequency. BMV = bag and mask ventilation; I&D = incision and drainage; OP/NP = oral and nasopharyngeal airways. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

Teamwork skills (scenarios)	Number of Programs
Angioedema	6
Neck hematoma	5
FB aspiration (pediatric)	5
Airway fire	3
Dislodged tracheotomy/false passage	3
Difficult intubation (radiation/tumor)	3
Pediatric difficult intubation	3
Tracheo-innominate fistula	2
Trauma, cannotintubate	1
Post-TORS bleed	1
Carotid blow out	1
T-tube airway distress	1
Laryngospasm	1
Pulmonary edema	1

Fig. 3. The teamwork scenarios provided during regional novice simulation-based boot camps, in order of frequency. FB = foreign body; TORS = transoral robotic surgery. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

new ones. In addition, the large number of participants as well as the large number and rapid pace of activities requires meticulous planning and coordination. Additional challenges include training sufficient faculty in simulation and debriefing skills, deciding what components should be standardized among boot camps, and providing faculty with sufficient time to participate in boot camps.

Recommendations:

- Regional boot camps as a group should decide on a standard set of four to six individual skills and one to three teamwork scenarios that should be offered by every regional boot camp, so that all residents are assured an opportunity to develop a basic set of skills.
- Individual boot camps can incorporate additional unique simulations based on local resources and to encourage ongoing innovation and improvement.

Financial Models

The Finance Sub-Committee received revenue and expense information from seven known regional boot camps for the July 2018 boot camp season to evaluate what financial costs are incurred with otolaryngology regional boot camps and how different centers manage these costs. The intention was to determine what investment would be needed to keep current boot camps running, what might be needed to expand the size and scope of a boot camp, and what would be needed to start a new program where one did not previously exist.

Categories of expenses were divided into simulation center fees; direct costs for disposables, equipment, food, travel and lodging, administration; and other. Categories of revenues included resident registration fees, educational grants, endowment, and other. A spreadsheet was emailed to each boot camp director, who then input their information on that spreadsheet. The information was compiled for all seven boot camps in narrative and tabular form and is presented in deidentified aggregate.

Revenue. Resident registration fees are the main source of revenue for all surveyed boot camps; fees ranged from $50 to $264 per resident. The residents' home departments universally paid for resident registrations. In general, registration fees covered supplies, disposables and food, but not simulation center fees or simulator rentals. One center reported that they enjoy funding from a departmental endowment to defray costs and one center obtained an industry-sponsored education grant. Funding did not always cover expenses.

Expenses. Expenses were sorted into several categories: materials, supplies, and equipment; administration; food; travel and lodging; and simulation center fees (Table I). No faculty honoraria were paid at any boot camp.

The costs of materials, supplies, and equipment varied considerably, with the greatest expense coming from three-dimensional (3D) printed materials and equipment rentals.

- Pig or sheep larynges and feet used for surgical airway, suturing and local flap exercises were usually

TABLE I.
Estimates of Costs for 2018 Otolaryngology Novice Simulation-Based Boot Camps.

Category	Range	Comments
Number of faculty	12–30	Faculty to Resident ratios of 1:1 to 1:2
Number of residents	10–50	
Materials		
Pig or sheep larynges or feet	$0 to 3192/boot camp	One site uses donated pig larynges
Disposables	$200 to 2250/boot camp	
Equipment	$0 to 11,848/boot camp	Equipment may be donated or rented
3D Models	$0 to $14,440/boot camp	Ears for pressure-equalization tube insertion
Food		
Breakfast	$250 to $550/boot camp	One site has an industry sponsor
Lunch	$704 to $1800/boot camp	One site has an industry sponsor
Snacks	$0 to $280/boot camp	
Dinner	$300 to 1300/boot camp	One site had an industry sponsor
Travel	$862.79 (one faculty, one site)	Most faculty used personal cars, some received reimbursement for gas and parking from departments
Lodging	$586.72 (one faculty, one site)	
Simulation center fees		
Simulation facilities	$0 to 40000/boot camp	2 boot camps incurred no charges for space, use of simulators, or support staff. 3 boot camps were charged for simulation center and support staff
Simulation staff	$0 to 16,000/boot camp	Based on number of stations, number of staff, number of hours to prepare and break down
Lab/room rental	$0 to 5453/day	2 boot camps incurred fees for room rentals or simulation support staff

3D = three dimensional.

acquired for less than $300 total, and sometimes donated.
- Disposable supplies cost up to $2000 per boot camp; costs varied depending on whether pre-packed kits were used or low-cost models were created.
- 3D printed models were relatively expensive, costing $350 to $800 per item.
- Equipment rentals were the most expensive when the equipment was not donated by a company or made available by a department.

Administrative services were not typically counted in boot camp budgets as an expense; hosting departments typically provided some level of administrative support and the faculty course directors reported committing significant administrative time to preparing for boot camps. In general, faculty time spent for boot camp development, creation of protocols and simulation scenarios, organization and preparation, travel, and administrative activities was not estimated. However, one site estimated the cost of 20 hours of faculty time spent; this site was supported by an educational endowment. Mailed and printed course materials, and the use of an online vendor for registration were the only other reported administrative expenses.

Food was provided by all boot camps, including breakfast, lunch, and snacks for learners and faculty; three centers provided dinner as well. Meal costs ranged from approximately $10 to $25 per person per meal; meals provided varied between boot camps. Travel and lodging expenses for both residents and faculty were largely covered by their home departments. One program covered the travel expenses for one faculty member.

Simulation center fees were not always charged as expenses, as the fee structure for simulation support varies widely from institution to institution. That said, when included, simulation center fees were often the most expensive aspect of a boot camp budget, costing up to $20,000 at one boot camp.

Overall expenses varied from less than $1000 to approximately $44,000, depending in part on the size of the boot camp (eg, number of residents participating) as well as local financial structures. Due to variability in costs and cost structures, exact per-person costs could not be consistently calculated. For example, the cost per person for some items may decrease for larger groups. Because of variable funding and expense structures, systematic funding and expense comparisons were not possible.

Recommendations:

- Otolaryngology simulation-based boot camps should stay as fiscally lean as possible
- Current and potential sources of revenue for ongoing boot camps include:
  1. Resident registration fees
  2. Unrestricted educational grants from industry sponsors
  3. Equipment loans from industry
  4. Grants to initiate and sustain boot camps from otolaryngology professional societies and organizations with educational missions

CONCLUSIONS

This survey of known simulation-based boot camps designed for novice otolaryngology residents provides an overview of their geographic distribution, curricula, and funding structures. Not surprisingly, boot camps tend to be in geographic areas with greater population density, like the Northeast. The Task Force recommends establishing nine or 10 regional boot camps distributed over the entire United States, which are offered over multiple coordinated dates. There is good alignment between the procedural and management skills that program directors feel should be included in boot camp curricula for novice residents, and the skills that are taught in most of the surveyed boot camps. In particular, there is interest in multiple surgical and non-surgical techniques to evaluate and control patients' airways. Most of the boot camps include teamwork scenarios that incorporate the recognition and management of various causes of airway obstruction and, less commonly, diverse hemorrhagic conditions and airway fires. The Task Force recommends that a consensus be developed for several individual skill and teamwork scenario objectives to be included in each boot camp, while allowing diverse simulation modalities. To our knowledge, this is the first publication to address otolaryngology boot camp financing. Boot camps have diverse expenses and range in the number of participating residents; funding is primarily supported by registration fees and voluntary faculty participation. The Task Force requests financial and administrative support from the SUO and other otolaryngology societies with educational missions to promote the establishment of new regional boot camps on a national level; a grant mechanism would allow oversight and accountability. Faculty education programs and standards for quality should be developed as boot camps mature.

BIBLIOGRAPHY

1. Tompkins JJ. Use of simulation boot camps to train junior otolaryngology residents: a resident's testimonial. *JAMA Otolaryngol Head Neck Surg* 2014;140:1–2.
2. Inaba K, Recinos G, Teixeira PGR, et al. Complications and death at the start of the new academic year: is there a July phenomenon? *J Trauma* 2010;68:19–22.
3. Young JQ, Ranji SR, Wachter RM, Lee CM, Niehaus B, Auerbach AD. "July effect": impact of the academic year-end changeover on patient outcomes: a systematic review. *Ann Intern Med* 2011;155:309–315.
4. Olasky J, Kim M, Muratore S, et al. ACS/ASE Medical Student Simulation-Based Skills Curriculum Study: implementation phase. *J Surg Educ* 2019;76:962–969.
5. Blackmore C, Austin J, Lopushinsky SR, Donnon T. Effects of postgraduate medical education "boot camps" on clinical skills, knowledge, and confidence: a meta-analysis. *J Grad Med Educ* 2014;6:643–652.
6. Association of American Medical Colleges. Simulation center use at medical schools. Available at: https://www.aamc.org/data-reports/curriculum-reports/interactive-data/simulation-center-use-medical-schools. Updated 2020. Accessed June 15, 2020.
7. Deutsch ES, Wiet GJ, Seidman M, Hussey HM, Malekzadeh S, Fried MP. Simulation activity in otolaryngology residencies. *Otolaryngol Head Neck Surg* 2015;153:193–201.
8. Schroedl C SS. Criterion 29–30: Using simulation in CME. Accreditation Council for Continuing Medical Education Web site. Available at: https://www.accme.org/resources/video-resources/accreditation-commendation/using-simulation-cme. Updated 2018. Accessed June 15, 2020.

9. Fried MP, Sadoughi B, Gibber MJ, et al. From virtual reality to the operating room: the endoscopic sinus surgery simulator experiment. *Otolaryngol Head Neck Surg* 2010;142:202–207.
10. Jabbour N, Snyderman CH. The economics of surgical simulation. *Otolaryngol Clin North Am* 2017;50:1029–1036.
11. Arriaga AF, Gawande AA, Raemer DB, et al. Pilot testing of a model for insurer-driven, large-scale multicenter simulation training for operating room teams. *Ann Surg* 2014;259:403–410.
12. Seeley MA, Kazarian E, King B, et al. Core concepts: orthopedic intern curriculum boot camp. *Orthopedics* 2016;39:62.
13. Sonnadara RR, Van Vliet A, Safir O, et al. Orthopedic boot camp: examining the effectiveness of an intensive surgical skills course. *Surgery* 2011;149:745–749.
14. Selden NR, Barbaro N, Origitano TC, Burchiel KJ. Fundamental skills for entering neurosurgery residents: report of a pacific region "boot camp" pilot course, 2009. *Neurosurgery* 2011;68:759–764.
15. Selden NR, Anderson VC, McCartney S, Origitano TC, Burchiel KJ, Barbaro NM. Society of neurological surgeons boot camp courses: knowledge retention and relevance of hands-on learning after 6 months of postgraduate year 1 training. *J Neurosurg* 2013;119:796–802.
16. Ortiz Figueroa F, Moftakhar Y, Dobbins Iv AL, et al. Trauma boot camp: a simulation-based pilot study. *Cureus* 2016;8:e463.
17. Heskin L, Mansour E, Lane B, et al. The impact of a surgical boot camp on early acquisition of technical and nontechnical skills by novice surgical trainees. *Am J Surg* 2015;210:570–577.
18. Nesbitt JC, Michaud NM, Brakebill A, Deppen SA, Williams P. Month-long cardiac surgery boot camp: a proposal to jumpstart resident training. *J Thorac Cardiovasc Surg* 2018;156:1151–1157.
19. Malekzadeh S, Malloy KM, Chu EE, Tompkins J, Battista A, Deutsch ES. ORL emergencies boot camp: using simulation to onboard residents. *Laryngoscope* 2011;121:2114–2121.
20. Malekzadeh S, Deutsch ES, Malloy KM. Simulation-based otorhinolaryngology emergencies boot camp: part 2: special skills using task trainers. *Laryngoscope* 2014;124:1566–1569.
21. Malloy KM, Malekzadeh S, Deutsch ES. Simulation-based otorhinolaryngology emergencies boot camp: part 1: curriculum design and airway skills. *Laryngoscope* 2014;124:1562–1565.
22. Deutsch ES, Malloy KM, Malekzadeh S. Simulation-based otorhinolaryngology emergencies boot camp: part 3: complex teamwork scenarios and conclusions. *Laryngoscope* 2014;124:1570–1572.
23. Chin CJ, Roth K, Rotenberg BW, Fung K. Emergencies in otolaryngology–head and neck surgery bootcamp: a novel Canadian experience. *Laryngoscope* 2014;124:2275–2280.
24. Deutsch ES, Orioles A, Kreicher K, Malloy KM, Rodgers DL. A qualitative analysis of faculty motivation to participate in otolaryngology simulation boot camps. *Laryngoscope* 2013;123:890–897.
25. Dean KM, DeMason CE, Choi SS, Malloy KM, Malekzadeh S. Otolaryngology boot camps: current landscape and future directions. *Laryngoscope* 2019;129:2707–2712.