

Contemporary Analysis of Otolaryngic Allergy

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Objectives: Investigate the current trends in otolaryngic allergy (OA).

Study Design: Cross-sectional survey.

Methods: Survey of active AAOA membership.

Results: Response rate was 27.3%. Regional response distribution rates were proportional to the AAOA membership distribution within the United States ($R^2 = 0.95$; $P < 0.001$), with no significant regional response bias demonstrated ($P = 0.428$).

Self-reported duration to OA competency was 5.8 years. Physicians reporting OA competency were more likely to be board-certified ($P < 0.001$) and have AAOA fellowship status ($P < 0.001$). The AAOA was reported to be the most valuable educational resource toward achieving OA competency, with residency training being least valuable ($P < 0.001$).

91.5% of respondents' practices offered OA services. Subcutaneous injections predominated at twice the utilization of sublingual immunotherapy. Allergy immunotherapy tablets were rarely utilized. Home allergy shots were offered by 45.2% of respondents. In-office immunotherapy vial compounding was preferred (95.8%) to third-party vendors. 94% of AAOA respondents identified patient compliance to be an issue within OA.

Non-inhalant allergy service integration included food allergy (63.5%), asthma (44.9%), allergic fungal sinusitis (43.8%), penicillin allergy (18%), stinging insect allergy (12.6%), and aspirin desensitization (3.9%).

Conclusion: Reported duration to OA competency after residency was surprisingly long. Further investigation of current and future educational/clinical training is warranted given clinical integration reported for OA. Otolaryngology is in the unique position to develop a comprehensive sino-allergy evidence-based strategy integrating the extensive diagnostic and medical treatment arms alongside the surgical expertise of the specialty within a clinical sino-allergy home concept.

Key Words: Otolaryngic allergy, competency, upstream downstream medical education, allergy shot compliance, allergy testing, allergy retesting, allergy immunotherapy, AIT, SCIT, home immunotherapy, population compliance, sino-allergy home, physician survey.

Level of Evidence: 5

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INTRODUCTION

Otolaryngic allergy (OA), defined as allergic disease affecting the ear, nose, and throat, was formalized as a concept in 1941 with the formation of the American Society of Ophthalmologic and Otolaryngologic Allergy.¹ Otolaryngic allergy is inclusive of sino-allergic and immunologic disease within the unified airway of the head and neck and is well

established as a core scope of practice within the specialty of otolaryngology. Data from recent national and regional otolaryngology surveys have consistently reported OA practice integration rates of between 78% to 84%, and historic and contemporary billing/utilization data and institutional surveys have shown OA-related billing codes to be the most utilized within otolaryngology.²⁻⁵ However, with few exceptions, most published survey studies reporting on OA trends have relied on general membership populations responding within broad scope surveys, which can carry significant response bias for detailed OA analysis, especially when response rates are 10% or less.

The goal of this study is to assess the current status of OA within the specialty of otolaryngology with a focus on pathways to competency, degree of clinical integration, testing and treatment protocol trends, as well as identifying areas in need of future investigation within the most identifiable OA segment of our specialty. In an effort to control for group response bias, we elected to survey the members of the American Academy of Otolaryngic Allergy (AAOA), whose active membership base represents 13% of all active practicing board-certified otolaryngologists in the United States today (Jami Lucas, BA, executive director of the AAOA, email communication January 2018)⁶. This subset of our specialty represents the highest potential

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for concentrated interest in OA through their allergy-specific societal affiliation.

MATERIALS AND METHODS

A literature review was performed to develop a comprehensive cross-sectional 25-question survey, which was reviewed and approved by the AAOA for distribution to its 1,632 active members in accordance to the terms of the 2018 AAOA licensing agreement granting access to the membership database. Survey distribution, collection, and analysis were performed using the Web-based Survey Monkey platform. All responses were confidential, with no tracking of the identity of the respondent. The content of the survey evaluated professional demographic data, OA competency measures, clinical integration, allergy immunotherapy (AIT) protocol development and utilization trends, as well as patient access to care and patient compliance. To maximize relevancy and accuracy of the response data, conditional branching (skip logic) was integrated into the survey design. Survey data was collected from March 15 to April 14, 2018.

Analysis

Stata 15 (StataCorp, College Station, TX) was used for all analyses. Linear regression was used to examine the association between regional response rates and regional AAOA membership distribution. Chi-squared tests were used for all other comparisons, except when there were fewer than five expected values in a cell; in this case, Fischer exact tests were used.

RESULTS

A 27.3% survey response rate with an 85% individual survey completion rate was achieved. Full results are reported in Supporting Table SI. Regional response distribution rates were proportional to the AAOA membership distribution within the United States ($R^2 = 0.95$; $P < 0.001$), with no significant regional response bias demonstrated ($P = 0.428$). Of the respondents, 91.5% were board-certified by the American Board of Otolaryngology–Head and Neck Surgery (ABOto); 52.3% were AAOA Fellows (FAAOA); and 10.1% were on a fellowship track. Private practitioners represented the majority of AAOA membership responses (67.4%), with academic, hospital-employed, and otolaryngology resident members being nearly equally distributed (11.9%, 11.7%, and 9.2%, respectively).

Assessing the perceived long-range value of OA to the future of otolaryngology, 81.6% reported that it was very valuable, and 14.6% reported that it was moderately valuable. No respondents indicated that there was no long-range value.

OA testing and AIT treatment integration into clinical practice were reported by 93.3% of respondents. AAOA membership category was not found to be a statistically significant determinant of OA service integration ($P = 0.11$); however, self-reporting of OA clinical competency was significant ($P < 0.001$), as was ABOto board certification ($P < 0.001$). FAAOA respondents were more likely than others to be actively involved in the detailed clinical management of allergy testing and immunotherapy protocols ($P < 0.001$).

The average duration to self reported achievement of OA competency was 5.8 years, with a standard deviation of 3.75 years, after completing residency. The physicians

who reported achievement of OA competency were more likely to be board-certified ($P < 0.001$) and had achieved FAAOA status ($P < 0.001$). The concept of OA competency was not defined within the survey but by the respondent.

Respondents were asked to rate their perceived value of OA educational resources contributing to their achievement of OA competency on a scale of 1 to 10. The weighted averages are reported in Figure 1. AAOA educational resources received the highest value weighted average (8.9), followed by ABOto board certification (6.7), Academy of Otolaryngology–Head and Neck Surgery (AAO–HNS) educational resources (6.5), and residency training (5.6). These relationships were statistically significant ($P < 0.001$). The concept of value was not defined within the survey but by the respondent.

Within clinical practice, OA services were offered in 91.5% of respondents' practices; of those, 95.8% independently prepared immunotherapy vials in their practice rather than outsourcing to third-party vendors.

General allergists (GA) were employed in 6.7% of respondents' practices providing OA services. Of those reporting GA employment, 45.5% were FAAOA and 9.1% were on a fellowship track. The majority of these physicians (83.3%) reported having achieved competency in otolaryngic allergy and were ABOto board-certified, with 75% reported being actively involved in allergy protocols and vial preparation design within their clinical practice. Breaking down by practice type, of those reporting GA employment, 50% were in private practice; 33% were in academic practice; and 16.7% were hospital-employed physicians.

The preferred skin-testing method reported was the modified quantitative testing technique, with serum allergy testing being the least utilized. The preferred intradermal skin testing technique used was with a multi-intradermal prick testing device (67.3%) rather than application of single intradermal prick technique (26.9%). No statistically significant testing trends were noted among the reported AAOA membership categories or by ABOto certification status (Fig. 2).

Within AIT treatment options offered, subcutaneous injections (SCIT) predominated at the twice the utilization of sublingual immunotherapy. Allergy immunotherapy tablets were rarely utilized (Fig. 3).

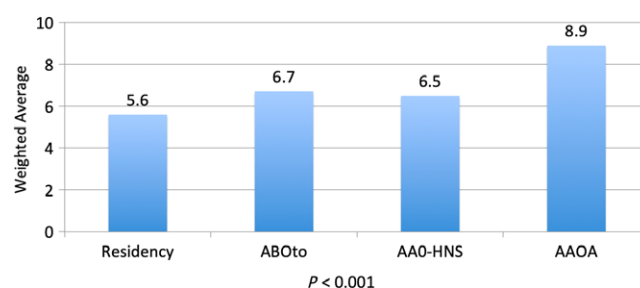


Fig. 1. Perceived educational value contributing to achievement of OA Competency Value scale of 1 to 10. The weighted average of each value is shown. AAO–HNS = Academy of Otolaryngology–Head and Neck Surgery; AAOA = American Academy of Otolaryngic Allergy; ABOto = American Board of Otolaryngology–Head and Neck Surgery; OA = otolaryngic allergy. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

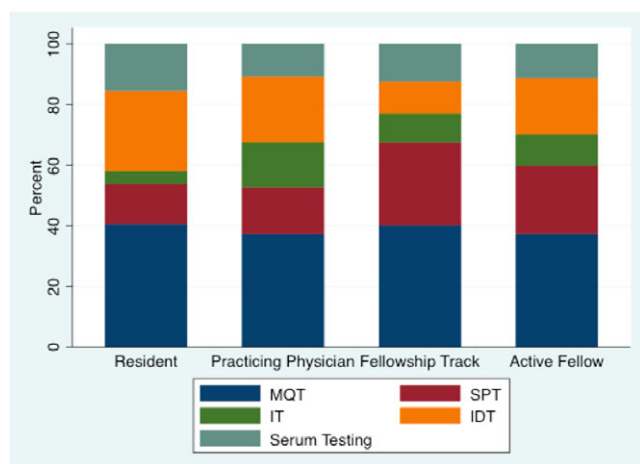


Fig. 2. Allergy testing: Reported utilization of methods. Percentage utilization of each testing method by respondent sub-category. IDT = intradermal dilutional testing; IT = intradermal testing; MQT = modified quantitative testing; SPT = skin prick testing.

In-office compounding of immunotherapy vials was reported by 95.8% of physicians, with only 4.2% utilizing offsite third-party sourcing of vial preparation. There were no significant differences in allergy vial compounding based on AAOA membership status ($P = 0.27$).

Following initiation of AIT, the use of outpatient or home SCIT (HSCIT) protocols was evaluated. HSCIT, for which patients were given the vial mixes for SCIT administration outside of a clinic setting, was not offered as a treatment option by 54.8% of respondents. Of the 45.2% of respondents who offered HSCIT protocols, 36.1% allowed HSCIT only after maintenance was reached, whereas 9.1% allowed HSCIT during buildup to maintenance. Physicians who reported they had achieved OA clinical competence were more likely to allow HSCIT ($P = 0.01$), as were physicians who used in-office vial preparation ($P = 0.045$).

Once on AIT, retesting intervals were surveyed, with 65.2% of physicians indicating that they retested patients only when recurrent symptoms became present and 8% reported no retesting strategies and instead utilized a defined predetermined AIT treatment cycle. Of the 26.4% of physicians who reported retesting on a set interval, only 1.4% utilized annual retesting, and recommendations for testing every 2 to 3 years or 4 to 5 years were nearly equally

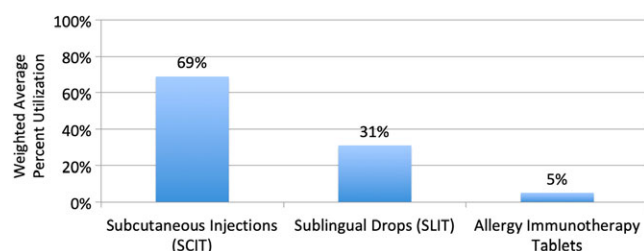


Fig. 3. Allergy immunotherapy treatment option utilization. Percentage that each allergy treatment option is utilized within the respondent's office. SCIT = subcutaneous injections; SLIT = sublingual immunotherapy. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

split (11.2% and 12.2%, respectively). FAAOA respondents were more likely to retest based on patient symptoms than other criteria when compared to other non-fellow members ($P = 0.05$). ABOto status and reported competency in OA were not found to be a statistical determinant within reported retesting strategies ($P = 0.06$ and $P = 0.224$, respectively).

Patient compliance while on AIT was reported to be an issue by 94% of physicians. The definition of patient AIT compliance was determined by the respondent. The most commonly reported variables related to non-compliance were the patient's work/life schedule (79.2%), followed by the large out-of-pocket expense (55.3%) and AIT insurance coverage issues (38.2%).

Diversity of allergy testing/management beyond inhalant seasonal and perennial environmental allergens was surveyed, with 81.2% of respondents indicating a clinical expansion beyond traditional sino-allergy OA management. Food allergy (63.5%), asthma (44.9%), allergic fungal sinusitis (AFS) (43.8%), penicillin allergy (18%), stinging insect allergy (12.6%), and aspirin desensitization (3.9%) clinical integration rates were reported. ABOto certification demonstrated no statistical impact on the diversity of allergy services offered; however, FAAOA respondents were more likely to manage AFS ($P = 0.009$) and asthma ($P < 0.001$).

Finally, perceived sources of competition in the provision of OA care found allergy/immunology physicians to be the most commonly reported (94.4%), followed by other otolaryngologists (46.1%), primary care physicians (17.1%), and pulmonologists (8%).

DISCUSSION

OA Competency

Incorporation of OA within otolaryngology education has grown significantly since in 1948 when the first allergy course was offered by Dr French Hansel, a physician regarded by many as the father of OA.¹ With the establishment of formal allergy credentialing and training requirements in the 1960s, ABOto became the first member of the American Board of Medical Specialties to list allergy as a scope-of-knowledge requirement for its board certification.¹ Currently, allergy/rhinology makes up 21% of the general otolaryngology section of the current Maintenance of Certification exam.⁷ In 1976, the American Medical Association Board of Trustees, through its "Report W", formally recognized allergy as an integral scope of practice within the residency training and clinical practice of otolaryngology.¹

By 1985, minimal OA residency training guidelines had been proposed, and in 1990 a home study course was developed to enhance OA residency education.^{8,9} In 2004, the Otolaryngology Residency Review Committee received approval from the Accreditation Council for Graduate Medical Education (ACGME) to expand OA training defined within the Program Requirements for Residency Education in Otolaryngology.¹⁰ Currently, OA training requirements are an integral part of the ACGME Outcomes Project within the otolaryngology scope-of-knowledge residency accreditation process.¹¹⁻¹³ This outcomes-based assessment

is designed to ensure that residents can demonstrate competency to provide defined OA care as well as measure the program's effectiveness on impacting the resident's achievement of competency as defined within the OA scope-of-knowledge curriculum (Fig. 4).¹³ Through this process, residents are now evaluated semiannually on specific OA milestones documented within five levels of achievement. Only the first four levels represent targets for achievement before completion of residency, whereas the fifth level represents advanced training above baseline residency milestone targets.

Within otolaryngology, no formal subspecialty certification for OA exists beyond ABOto board certification.¹⁴ Downstream postgraduate continuing medical education (CME) is available through the AAOA and AAO-HNS educational platforms.^{1,15–17} Candidacy as a Fellow within the AAOA is achieved through written and oral examinations following additional OA training, after completion of an accredited otolaryngology residency training program and achievement of ABOto board certification.^{1,17,18}

These extensive educational milestones and efforts are reflected in the 91.5% OA clinical integration rate reported within this survey. Of note, the average duration to self-reported OA competency of 5.8 years following residency is surprising. However, the large standard deviation of 3.7 years may be indicative of a more historically weighted duration to competency due to the currently reported OA integration in otolaryngology today. Given the statistical relationship with ABO to board

certification, AAOA fellowship status, involvement in detailed management of allergy testing and immunotherapy protocols, utilization of outpatient immunotherapy protocols, and clinical integration beyond traditional inhalant allergy services to include asthma and allergic fungal sinusitis immunotherapy management, self-reported OA competency within this AAOA membership survey proved to be consistent with the most comprehensively engaged respondent's status.

Because of the high degree of overlapping comorbidity within sino-allergy disease, a goal of our specialty's leadership should always be to shorten the pathway to OA competency and expand clinical expertise through both the upstream (residency training curriculum) and downstream (postgraduate training and CME educational platforms).^{19,20} Evaluating the upstream impact of the 2003 resident work-hour restrictions needs further investigation. Recent resident surveys do consistently report a need, or desire, for more OA training during residency (Fig. 5).⁵ In 2015, 12.4% of all U.S. otolaryngology residents were registered members of the AAOA (Jami Lucas, BA, executive director of the AAOA, BA, email communication March, 2018) (Fig. 6).²¹

Published residency training surveys also demonstrate a consistent divergence between program director- and resident-reported OA competency/experience.^{22,23} This dichotomy between the measured achievement of single metrics (core competency) and the collective application of these combined metrics in establishing clinical best

Inhalant Allergy — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
• Demonstrates familiarity with basic nasal anatomy and normal respiratory mucosa histology • Demonstrates familiarity with normal functions of nasal mucosa and nasal cavities • Demonstrates limited knowledge of allergy work-up	• Demonstrates basic understanding of derangements in nasal anatomy and mucosal inflammation • Knows pathophysiology of allergic rhinitis (AR) • Describes comorbidities in AR • Demonstrates familiarity with clinical presentations of allergic disease • Prescribes basic medical treatment for AR	• Demonstrates knowledge of histopathology of allergic rhinitis and anatomic factors affecting the nasal airway • Knows pathophysiology of non-allergic rhinitis • Describes the natural history and components of severity in allergic disease • Demonstrates knowledge of testing methods in allergic disease • Prescribes advanced medical treatment for allergic disease	• Demonstrates thorough understanding of anatomic impact of allergic inflammation on the nasal airway • Distinguishes presentations of allergic and non-allergic rhinitis patients; demonstrates knowledge of cellular and molecular features of inhalant allergy • Describes systems for AR subtype and severity (e.g., seasonal vs. perennial, intermittent vs. persistent, etc.) and incorporates knowledge of severity and natural history into patient management • Combines clinical features and test results to correctly diagnose allergic disease • Demonstrates a working knowledge of immunotherapy for allergic disease	• Demonstrates advanced understanding of allergy diagnostic testing • Is facile with multiple methods of immunotherapy

Fig. 4. Accreditation Council for Graduate Medical Education-accredited otolaryngology residency program milestones. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

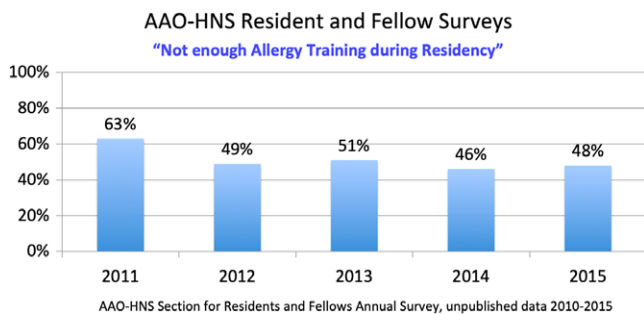


Fig. 5. Resident survey response on need for more allergy training AAO-HNS section for Residents and Fellows-in-Training Annual Survey. AAO-HNS = Academy of Otolaryngology-Head and Neck Surgery. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

practice (functional competency) is well recognized.^{13,24–28} The elimination of this dichotomy is a primary goal for the ACGME Outcomes Project Milestone strategy incorporated by the ABoto since 2013. Active residency program curriculum review and modifications are being undertaken and should incorporate resident feedback, as well as current published workforce OA integration and utilization data, when addressing priority for change to ensure that the future workforce is prepared to meet the anticipated required skill sets.^{2,3,5,21,29}

Patient Compliance, Duration of Treatment, and Retesting Strategies

The ideal reported duration of AIT for single antigen therapy has been described as between 3 to 5 years to achieve sustained long-term AIT-independent immunologic desensitization.^{19,30–38} Detailed published data on ideal duration for multiple antigen therapy is lacking and needs further study. The literature identifies the key determinant for duration of AIT to be patient compliance, not physician decision making.^{33,36,38–45} Ninety-four percent of the AAOA respondents identified patient compliance to be an issue within OA within this survey. The window of patient noncompliance is highest in the first stage of AIT disease modification, when achieved symptom control is

AIT-dependent.^{33,36,43,46} During this window of maximum noncompliance, AIT cessation is not because of lack of symptom control; it is because of the absence of symptoms. This is a widely reported phenomenon in chronic disease management.⁴⁷ The decrease in symptom-driven motivation necessary to overcome the financial/lifestyle burden associated with the continuation of AIT results in an increase in behavioral noncompliance. Unfortunately, the symptom driven motivation for continuation of AIT reaches its lowest point during the AIT-dependent phase, estimated to occur within the first 3 years of single-antigen AIT. This cessation of therapy results in suboptimal therapeutic achievement of the AIT-independent phase due to incomplete treatment. This low symptom/high AIT inconvenience ratio results in noncompliant rates approaching 75% after 3 years of AIT.^{31,32,47}

In our survey, symptom relapse-driven testing (SRDT) strategies were recommended as the primary retesting strategy by a majority of AAOA respondents. However, It is not clear how SRDT enhances compliance in the early AIT-dependent symptom controlled phase. SRDT likely offers minimal patient compliance bridging effect during the low-symptom/high-noncompliance AIT-dependent window. Thus, SRDT would likely have minimal impact on achievement of the late second-phase AIT-independent symptom control phase, the successful final endpoint of any AIT protocol.

A strategy of scheduled interval retesting (SIR) that is recommended by 26.4% of AAOA respondents may provide important data quantifying the degree of AIT-independent symptom control achievement. SIR, in conjunction with clinical history, can offer a potential precision medicine model of evidence-based late-phase AIT goal attainment. This clinical feedback can potentially enhance adherence to AIT, increasing patient compliance to fully complete the intended AIT protocol, thus achieving maximum clinical benefit. Annual testing, being reported by only 1% of respondents, is not supported by the current literature and would need further investigation and peer-reviewed data to justify the expense/benefit.

Home SCIT (HSCIT)

The most frequently referenced consensus statement against the application of HSCIT protocols was published in 1981 by the American Academy of Allergy and Immunology, currently the American Academy of Allergy Asthma and Immunology (AAAAI).⁴⁸ The position statement supported delivery of AIT only in an office setting with available resuscitative equipment and trained staff. A modified 1993 position statement opened the door for the risk-benefit analysis for HSCIT delivery options in only exceptional circumstances.⁴⁹ The Joint Task Force on Practice Parameters, encompassing the AAAAI and the American College of Allergy, Asthma and Immunology, issued follow-up statements in 2007 and 2010 maintaining the option for HSCIT on an individual and exceptional basis if lack of access to office-based AIT prevented SCIT delivery and if the benefits of HSCIT significantly outweigh the risks.^{50,51} The recommendations emphasized that HSCIT should only be administered by a trained adult and not patient self-administered. The 2015 AAOA Clinical Care Statement recognized the safe

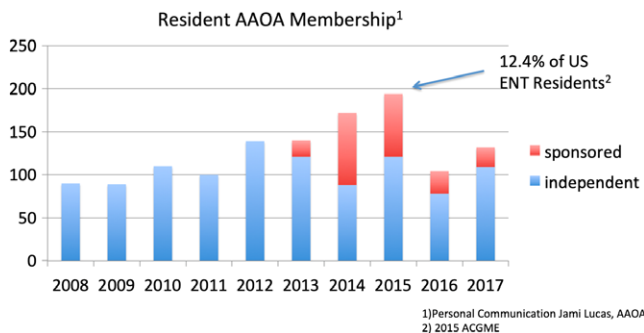


Fig. 6. AAOA residency membership trends. Red: residency-sponsored member; blue: independent resident member (self-pay). AAOA = American Academy of Otolaryngic Allergy; ACGME = Accreditation Council for Graduate Medical Education; ENT = ear, nose, throat. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

viability of HSCIT with proper patient education and training when injections are also given in the presence of a responsible adult with immediate availability of an epinephrine autoinjector.⁵² Several published studies and peer-reviewed clinical case reports demonstrate the safety of HSCIT within the AAAAI, otolaryngology, and family practice literature.^{42,43,53–58} However, little detail has been reported defining the dosing or efficacy of specific HSCIT protocols compared to those utilized for in-office patient populations.

In our survey, 45.2% of respondents offered HSCIT protocols. This represents one of the largest HSCIT clinical integration rates ever reported in the literature and establishes the statistical link to OA competency within this survey population, highlighting the complexity within this outpatient immunotherapy model. The majority (35.1%) of AAOA respondents offering HSCIT did so only after maintenance dose had been reached, indicating that buildup was done in an office setting. Only 9.1% of the respondents allowed for HSCIT during the buildup to maintenance phase, indicating a minority practice within the survey population. HSCIT pre-maintenance buildup is reported in the literature; yet again, little protocol or dosing specifics are reported.^{19,54,55} This survey indicates the increased adoption of HSCIT reported within the AAOA membership population is likely due to the inherent cost savings and expanded access to care that HSCIT protocols realize. Further research and delineation of specific guidelines are necessary to stratify the population pools suitable for outpatient quality and the safety protocols regarding buildup and maintenance strategies for this OA application.

Future Value-Based Healthcare: Sino-Allergy Medical Home

In an era of increasing consumer- and employer-driven healthcare, value of care is all-important. The management and demonstration of a cost-benefit relationship between duration of therapy, patient compliance, patient experience, and outcomes are critical to demonstrate and are more commonly found in a medical patient home setting. The medical patient home concept has been found to have a positive correlation in improved patient compliance within allergy immunotherapy.^{40,41,59,60} The patient-centered strategies that can maximize population compliance within an active OA setting to more predictably reach treatment endpoints need to be developed and integrated within clinical best practice standards. Population compliance can be significantly enhanced through the future integration of precision health concepts within the spectrum of sino-allergy disease, a center-of-excellence model that combines disease prediction and prevention, classification, treatment, and monitoring in an integrated clinical best practice of measurable outcomes.^{61–63}

CONCLUSION

Our survey indicates that OA is a very dynamic, active process in otolaryngology clinical practice. It is a highly protocol-driven process with significant potential for enhanced integration with sino-allergy disease management

within evolving value-based healthcare models. The reported 91.5% OA service line integration is the highest reported in the literature, which is not surprising given the AAOA member population surveyed.

The keys to future growth and success of OA will rely on continued expansion of efficient upstream and downstream educational platforms to achieve and maintain OA competency. Future studies will need to focus on the development of interactive patient-driven strategies to enhance AIT compliance and better define the duration to achieve AIT-independent symptom control with multi-antigen AIT. Future evidence-based protocols developed within a precision health strategy will better identify and streamline best practices to improve outcomes, contain costs, and increase OA immunotherapy availability to patients.

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LARY_28002_Supporting Table SI

Contemporary Analysis of Otolaryngic Allergy Survey Q1. Which best represents your Current Practice Status?

	Responses	
Resident in training	9.2%	41
Private Practice Otolaryngologist	67.4%	300
Hospital/Health System Employed Otolaryngologist	11.7%	52
Academic Otolaryngologist	11.9%	53
Answered	445	

Q2. What Region of the US do currently live in?

	Responses	
New England (CT, MA, ME, NH, RI, VT)	5.3%	21
Mid Atlantic (NJ, NY, PA)	12.1%	48
South Atlantic (DE, FL, GA, MD, NC, SC, VA, WV)	22.4%	89
South Central (AL, AR, KY, LA, MS, OK, TN, TX)	23.2%	92
North Central (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI)	20.7%	82
Mountain (AZ, CO, ID, MT, NM, NV, UT, WY)	8.1%	32
Pacific (CA, OR, WA, AK, HI)	7.6%	30
I practice outside of the US	0.8%	3
Answered	397	

Q3. Are you Board Certified by the American Board of Otolaryngology?

	Responses	
Yes		364
No	8.5%	34
Answered	398	

Q4. Rank the value of your Otolaryngology Board Certification for your competency to manage allergy patients with testing and immunotherapy.

	Responses	
1 (Not Valuable)	5.3%	19
2	5.3%	19
3	7.0%	25

4		7.3%	26
5		5.0%	18
6		13.2%	47
7		12.6%	45
8		15.4%	55
9		5.6%	20
10	(Extremely Valuable)	23.3%	83

		Weighted
		Average
		6.65
		Answered
		357

Q5. Rank the Value of your Residency Training for your competency to manage allergy patients with testing and immunotherapy.

		Responses	
star		7.7%	30
2		10.8%	42
3		12.3%	48
4		7.5%	29
5		9.0%	35
6		14.1%	55
7		7.7%	30
8		9.3%	36
9		7.2%	28
10	(Extremely Valuable)	14.4%	56

Weighted
Average
5.63
Answered
389

Q6. How would you rank the Long-Range Value of Otolaryngic Allergy within the future of our specialty as a whole?

		Responses	
Not Valuable		0.0%	0
Neutral Opinion		1.5%	6
Slightly Valuable		2.3%	9
Moderately Valuable		14.6%	57
Very Valuable		81.6%	319
		Answered	391

Q7. Are you a member of the American Academy of Otolaryngic Allergy (AAOA)?

		Responses	
Yes		97.2%	381
No		2.8%	11
		Answered	392

Q8. As a Member of AAOA, which best describes your Active Status?

	Responses	
Resident in-training Member	3.2%	12
Practicing Physician Member	34.4%	129
Practicing Physician Member on Fellowship Track	10.1%	38
Active Certified Fellow (FAAOA)	52.3%	196
	Answered	375

Q9. Rank the Value of the AAOA for your competency to actively manage allergy patients with testing and immunotherapy.

	Responses	
1 (Not Valuable)	0.3%	1
2	0.3%	1
3	0.8%	3
4	0.3%	1
5	2.1%	8
6	4.0%	15
7	8.3%	31
8	15.8%	59
9	13.4%	50
10 (Extremely Valuable)	54.8%	205
	Weighted	
	Average	8.92
	Answered	374

Q10. Rank the value of the American Academy of Otolaryngology (AAO-HNS) for your competency to actively manage allergy patients with testing and immunotherapy.

	Responses	
1 (Not Valuable)	5.2%	20
2	4.1%	16
3	5.4%	21
4	8.5%	33
5	12.1%	47
6	16.2%	63
7	10.8%	42
8	9.3%	36
9	8.8%	34
10 (Extremely Valuable)	19.6%	76
	Weighted	
	Average	6.46
	Answered	388

Q11. What AAOA Meetings and Educational Resources have you participated in the Past? (multiple selections allowed)

	Responses	
AAOA Annual Meeting	74.0%	287
AAOA Basic Course	93.0%	361
AAOA Advanced Course	82.7%	321
Interactive Allergy & Rhinology Course and Resident Forum	26.6%	103
AAOA on-line CME courses	22.2%	86
None	0.5%	2
None, but I do plan on engaging AAOA resources in the future	2.1%	8
Answered		388

Q12. Do you feel you have Achieved Clinical Competency in Otolaryngic Allergy?

	Responses	
Yes	88.2%	343
No	11.8%	46
Answered		389

Q13. How many years AFTER your ENT Residency did it take for you to become competent in allergy testing and immunotherapy?

	Responses	
Answer (years)	0.0%	0
1	18.2%	61
2	18.8%	63
3	13.4%	45
4	7.4%	25
5	14.0%	47
6	2.4%	8
7	2.1%	7
8	2.7%	9
9	0.0%	0
10	8.9%	30
>10	11.9%	40
Not a goal of mine	0.3%	1
Weighted		
Average		5.8 years
Answered		336

Q14. Does your practice/department Offer Allergy Immunotherapy Treatment Options for patients?

	Responses
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Yes	93.3%	361
No	6.7%	26
Answered		387

Q15. Does your practice/department Employ General Allergists (non-otolaryngologists) as a part of your allergy services structure?

	Responses	
Yes	6.7%	24
No	93.3%	335
Answered		359

Q16. Rank the Percentage of allergy Immunotherapy Treatment Options offered by your practice/department. (combined total should equal 100%)

	Total	Weighted Average
Subcutaneous injections (SCIT)	358	6.9
Sublingual allergy Drops (SLIT)	339	3.1
Allergy Immunotherapy Tablets	307	0.5
Answered		360

Q17. How are Allergy Vials Prepared?

	Responses	
In-house	95.8%	346
Off-site 3rd party	4.2%	15
Answered		361

Q18. Are you Actively Involved in the Clinical Management of allergy testing and immunotherapy protocols and vial preparation for your patients?

	Responses	
Yes	87.8%	317
No	12.2%	44
Answered		361

Q19. Rank the Frequency of Utilization of the Following Methods of Allergy Testing your practice/department utilizes? (Combined total should equal 100%)

	Total	Weighted Average
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180	1.9
191	3.0

Modified Quantitative Testing (MQT)	263	6.0
Skin Prick Testing (SPT)	201	3.3
Serum Allergy Testing (RAST, ImmunoCAP, ect)	272	1.8
Answered	310	
Skipped	135	

Q20. What is the Preferred Intradermal Skin Testing Method for your practice/department?

	Responses	
Application of Single Intradermal Pricks	26.9%	83
Multi-Intradermal Prick Testing Device	67.3%	208
No Intradermal Skin Testing is utilized in our practice/department	4.5%	14
I am not sure	1.3%	4
Answered	309	

Q21. What other Forms of Allergy Related Testing/Management does your practice/department provide? (multiple selections allowed)

	Responses	
Food Allergy	63.5%	226
Asthma	44.9%	160
Stinging Insect Allergy	12.6%	45
Allergic Fungal Sinusitis Allergy	43.8%	156
Penicillin Allergy	18.0%	64
Aspirin Desensitization	3.9%	14
None	18.0%	64
Answered	356	

Q22. Do you allow for Outpatient Home Allergy Shots?

	Responses	
Home Allergy shots allowed During Buildup to Maintenance	9.1%	32
Home Allergy shots only allowed After Maintenance Reached	36.1%	127
We DO NOT allow for outpatient allergy shots	54.8%	193
Answered	352	

Q23. Once allergy shots are started, when do you Retest your patients to assess response to the immunotherapy protocol?

	Responses	
Never, Use a Fixed Duration Treatment Cycle	8.0%	28
Based ONLY on Patient Symptoms	65.6%	229
Annually	1.4%	5
Every 2-3 years	11.2%	39
4-5 years	12.3%	43

6-7 years	1.4%	5
8-9 years	0.0%	0
Every 10 years	0.0%	0
Answered		349

Q24. What are the Most Common Reasons for allergy patient immunotherapy Non-Compliance? (multiple selections allowed)

	Responses	
Patient Compliance is NOT an Issue	6.0%	21
Large Out-Of Pocket Expenses	55.3%	194
Allergy Treatment an Insurance Non-Covered Service	38.2%	134
Hours of Operation of the Allergy Clinic	18.8%	66
Convenience and Ease of Access of Allergy Clinic Location	33.9%	119
Patient's Work/Life Schedule	79.2%	278
Patient Changed to Another Allergy Clinic	3.7%	13
Answered		351

Q25. Source of Allergy Competition in your area (multiple selections allowed)

	Responses	
Allergy/Immunologists	94.4%	354
Pulmonologist	8.0%	30
Primary Care	17.1%	64
Other Otolaryngologists	46.1%	173
Answered		375

