

ONLINE FIRST

Otolaryngology Education in Family Medicine and Communication Sciences Training

Samir Baig, MD; Michael J. Cunningham, MD

Objectives: To characterize the extent and format of otolaryngology instruction during family medicine and communication disorders training and to determine the comfort level of graduate trainees to assess specific hearing disorders.

Design: Online surveys were sent to program directors in the fields of family medicine, audiology, and speech pathology. Directors were asked to delineate methods of teaching otolaryngology-related material and to define how often otolaryngologists were involved in their curricula. They were also asked to rate their graduate trainees' ability to manage 3 clinical scenarios involving pediatric hearing impairment.

Participants: A total of 682 surveys were sent using e-mail addresses from the American Medical Association and the Council of Academic Programs in Communication Sciences and Disorders.

Results: Response rates were 20% for family medicine programs and 30% for each of the communication science disciplines. Virtually all respondent family medi-

cine programs have dedicated instruction in otolaryngology, typically in the form of a clinical rotation (98%). Ninety-five percent of audiology programs involve an otolaryngologist in teaching compared with 55% of speech pathology programs. Otolaryngology-related diagnostic examination skills are taught by most programs in all 3 disciplines; confirmation of skills acquisition, however, is lacking. Directors rated the competence of their trainees to manage hearing disorders at an average of 3.4 for audiology, 2.7 for speech pathology, and 2.6 for family medicine graduates on a 4-point scale.

Conclusions: Respondent directors from all 3 disciplines make a concerted effort to teach otolaryngology-related topics. A greater emphasis on those otolaryngology disorders requiring multidisciplinary care appears necessary, as does more formal instruction in and competency evaluation of diagnostic examination skills.

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Author Affiliations:

Department of Otolaryngology, Massachusetts Eye and Ear Infirmary (Dr Baig), and Department of Otolaryngology, Harvard Medical School (Dr Cunningham), Boston, Massachusetts. Dr Cunningham is now with the Department of Otolaryngology, Children's Hospital of Boston.

CHILDREN WITH DISORDERS of the ear, nose, and throat have a substantial part of their care provided by pediatric and family medicine physicians as well as audiologists and speech pathologists. Pediatricians and family practitioners are often the first physicians to evaluate otolaryngology-related complaints, and speech pathologists and audiologists play a crucial role in the habilitation of many otolaryngology-related conditions. All 4 of these disciplines have guidelines regarding the inclusion of otolaryngology-related material in their program training requirements.

For example, the American College of Graduate Medical Education (ACGME) requirements for pediatric residency train-

ing programs indicate that residents should have exposure to hearing screening, the simple removal of foreign bodies, and tympanogram and audiogram interpretation; the guidelines also allow for a pediatric otolaryngology elective.¹ For family medicine residency programs, ACGME guidelines state that residents must have adequately structured, hands-on, educational experiences in several subspecialty areas, including otorhinolaryngology.²

The American Speech Language Hearing Association (ASHA) 2011 Standards and Implementation Procedures for the Certificate of Clinical Competence in Audiology require candidates to have knowledge of "anatomy and physiology, pathophysiology and embryology, and development of the auditory and vestibular systems" as well as to be able to per-

form an otoscopic examination and to determine the need for cerumen removal.³ Similarly, the 2005 ASHA Standards and Implementation Procedures for the Certificate of Clinical Competence in Speech-Language Pathology indicate that candidates must demonstrate knowledge of communication and swallowing disorders, including their causes and “anatomical/physiological, acoustic, psychological, developmental, linguistic, and cultural correlates”; the ability to “select or develop and use appropriate materials and instrumentation for prevention and intervention” is also required.⁴

Despite such existent program requirements and the importance of such specialists in the care of children with ear, nose, and throat disorders, literature as to the depth and uniformity of otolaryngology training in these disciplines is limited.⁵ A survey of program directors was therefore undertaken to gain an understanding of the extent of formal otolaryngology instruction in their respective training programs, the participation (or not) of otolaryngologists in this instruction, and the methods used. The directors were also asked to assess their graduates’ competence to manage several clinical scenarios relative to desired educational outcomes.

METHODS

Five online surveys—pediatric, family practice, audiology, speech pathology, and combined audiology/speech pathology—were developed using www.surveymonkey.com. The surveys received institutional review board exemption. Each survey included 9 items. The pediatric and family medicine surveys were near identical, differing primarily with respect to questions designed to assess accomplishment of standards set for each discipline by the ACGME. The audiology and speech pathology surveys similarly resembled one another, differing only in respect to their respective ASHA guidelines.

The pediatric and family medicine (**Figure 1**) surveys assessed whether programs dedicated a specific amount of time toward otolaryngology teaching and the manner in which such education was achieved, specifically whether by clinical exposure, lecture by an otolaryngologist, lecture by a nonotolaryngologist, Web-based module, skills laboratory, or demonstrative video. Directors were also asked whether their program included the opportunity for an elective in otolaryngology. The training of residents in otolaryngology-related skills such as middle ear pneumatoscopy and tympanogram and audiogram interpretation and the diagnostic evaluation of congenital hearing loss was queried, as were the means by which proficiency in these skills was judged, eg, self-evaluation survey vs practical examination by an otolaryngologist or a nonotolaryngologist. These specific diagnostic skills were chosen based on ACGME program requirements for pediatric residency programs and were therefore deemed appropriate for family medicine programs as well.

Both the speech pathology and the audiology (**Figure 2**) surveys asked directors to describe the amount of clinical time that their trainees spent with an otolaryngologist and how often a trainee otherwise interacted with an otolaryngologist to determine a patient care plan. Further questions were aimed at ascertaining the ways in which otolaryngologists contributed or could contribute to their training programs, through didactic lecture, clinical rotation, skills laboratory, demonstrative video, or Web-based module. To address the ASHA certification requirement for familiarity with certain diagnostic examination techniques, speech pathology directors were asked

The Status of Otolaryngology Education in Family Medical Residency Training

1. Is there a required amount of time in your residency program devoted to teaching otolaryngology related material?
 - Yes
 - No
2. If yes, what form does this exposure take? (check all that apply)
 - Lecture/didactic by an otolaryngologist
 - Lecture/didactic by a non-otolaryngologist
 - Rotation/clinical exposure
 - Web based module
 - Demonstrative video
 - Skills lab
 - No required exposure
 - Other (please specify)
3. How much time are residents allowed for elective rotations during their residency?
 - 0
 - 1-2 months
 - 2-4 months
 - 4 months
4. Does your program include the option of an elective rotation in otolaryngology?
 - Yes
 - No
5. Please indicate the items below for which your residents receive formal training (check all that apply):
 - Middle ear disease evaluation including pneumatoscopy
 - The interpretation of tympanograms and audiograms
 - The diagnostic evaluation of congenital hearing loss
 - No formal training administered for any of the above
6. If yes to any of the above, please indicate the methods your program uses to evaluate the residents’ competent achievement of these items (check all that apply):
 - No formalized evaluation
 - Self-evaluation survey
 - Practical examination with evaluation by non-otolaryngologist
 - Practical examination with evaluation by an otolaryngologist
 - Other (please specify)

For questions 7-9, please indicate the degree to which you feel a graduating resident from your program is prepared to manage the clinical problem indicated, on a scale of 1-4, 4 being the most prepared.

7. A premature infant who fails a newborn hearing screening.
8. A two year old child with a craniofacial syndrome, conductive hearing loss and expressive language delay.
9. A seven year old child with unilateral profound sensorineural hearing loss detected initially by a school hearing screening.

Figure 1. Survey sent to family medicine residency program directors.

about trainee instruction in the performance of flexible nasopharyngoscopy and rigid laryngoscopy. Audiology directors were asked about the formal teaching of pneumatoscopy and cerumen removal. Both directors were asked about evaluative methods of competence of performance.

Finally, all directors were asked to rate the ability of a graduating trainee from their program to manage 3 specific childhood hearing disorder case scenarios: (1) a premature infant who fails a newborn hearing screening; (2) a 2-year-old child with a craniofacial syndrome, conductive hearing loss, and expressive language delay; and (3) a 7-year-old child with unilateral sensorineural hearing loss that was detected initially on a school hearing screening. A rating scale from 1 to 4, with 4 being the most proficient, was used (Figures 1 and 2). The surveys were e-mailed with a cover letter explaining intent, ensuring confidentiality, and explaining that results would be reported in a deidentified manner.

The e-mail addresses of family medicine program directors were obtained from listings from the American Medical Association Fellowship and Residency Electronic Interactive Database (FRIEDA) Web site, and those of speech pathology and audiology program directors were obtained from the Council of Academic Programs in Communication Sciences and Dis-

The Status of Otolaryngology Education in Audiology Training

- How many months of practicum are spent in a site that has frequent interaction with an otolaryngologist in conjunction with patient care?
 - No time spent with an otolaryngologist
 - 1 month or less
 - 2-3 months
 - >4 months
- How often will a trainee in your program observe or develop a plan for a patient that involves an otolaryngologist?
 - Almost never
 - Once every few months
 - Once or twice a month
 - Once a week
- Please indicate the activities in which an otolaryngologist participates in teaching your trainees (check all that apply):
 - Otolaryngologists do not participate in training
 - Lecture
 - Instruction in otolaryngology clinic
 - Instructing in skills lab
 - Other (please specify)
- Do you feel your program could be improved by more involvement with otolaryngologists? If so, please indicate the area(s) in which their contribution would be most helpful (check all that apply):
 - Do not feel that students would benefit from additional instruction
 - Lecture/didactic training
 - Rotation/clinical exposure
 - Web based module
 - Skills lab
 - Other (please specify)
- Please indicate the items below for which your trainees receive formal training (check all that apply):
 - Removal of cerumen impaction
 - Middle ear otoscopy including pneumatoscopy
 - No formal training administered for any of the above
- If yes to any of the above, please indicate the methods your program uses to evaluate the residents' competent achievement of these items (check all that apply):
 - No formalized evaluation
 - Self-evaluation survey
 - Practical examination with evaluation by non-otolaryngologist
 - Practical examination with evaluation by an otolaryngologist
 - Other (please specify)

For the clinical scenarios in questions 7-9, please indicate how prepared a graduating trainee from your program would be to coordinate audiologic care with the medical surgical care given by an otolaryngologist.

- Audiologic care for a premature infant who fails a newborn hearing screening.
- Audiologic care for a two year old child with a craniofacial syndrome, conductive hearing loss and expressive language delay.
- Audiologic care for a seven year old child with unilateral profound sensorineural hearing loss detected initially by a school hearing screening.

Figure 2. Survey sent to audiology training program directors.

orders Web site. The ASHA programs that offered dedicated degrees in audiology and speech pathology were sent surveys with questions pertaining to both disciplines, whereas programs that offered degrees in either speech pathology or audiology were sent a survey with questions pertaining only to their respective discipline. The surveys were sent by e-mail 3 times over an 8-week period. Undeliverable surveys and those that received "out of office replies" on all attempts were eliminated from analysis. The Association of Pediatric Program Directors would not approve the survey for distribution to its members.

RESULTS

Overall, survey responses were 32% for speech pathology programs, 30% for audiology programs, and 20% for family medicine programs. Although these response rates are less robust than ideally anticipated, the data ob-

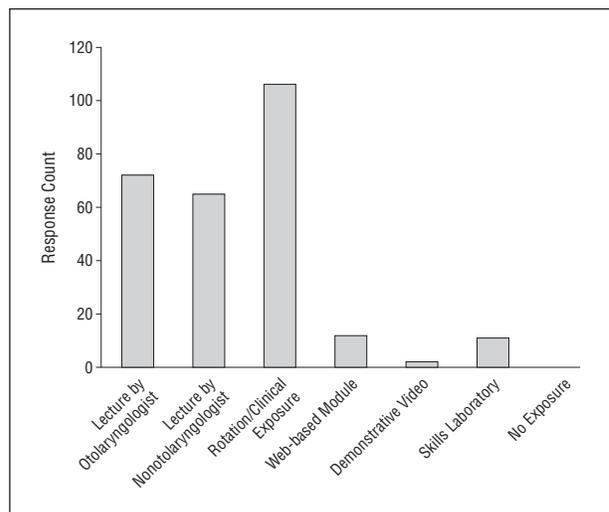


Figure 3. Educational format for teaching otolaryngology in family medicine programs (response count in absolute numbers).

tained do indicate discipline-specific trends in otolaryngology education.

Almost all family medicine programs that responded dedicate time to teaching otolaryngology-related material, typically in the form of a clinical rotation (98%), augmented by didactic teaching by an otolaryngologist (70%) or a nonotolaryngologist (60%) (**Figure 3**). Almost all respondent programs (92%) include the option of an otorhinolaryngology elective. Approximately 80% of the programs teach middle ear disease assessment and audiogram evaluation, with one-third of them including formal instruction on the diagnostic evaluation of congenital hearing loss. Fifty-six percent of the programs include some form of formalized competency evaluation for the queried diagnostic examination skills. Responding program directors gave their graduating trainees a composite average score of 2.6 as to their ability to manage the indicated hearing disorders; the best rated scenario was that of a premature infant who fails a newborn hearing screening.

Nearly all respondent audiology program directors reported that their trainees had frequent practicum interaction with an otolaryngologist (95%). Respondent speech pathology program directors reported that that was the case much less frequently (55%). This discrepancy in the comparative amounts of otolaryngology exposure is highlighted by the finding that 29% of speech pathology programs, in contrast to 10% of audiology programs, reported that their trainees "almost never" developed a management plan for a patient in concert with an otolaryngologist. When an otolaryngologist was directly involved with teaching in either discipline, it was most commonly in the form of a lecture or a clinical rotation. These were the teaching methods of choice in 26% of speech pathology programs and in 46% of audiology programs (**Figure 4**). Program directors in both disciplines overwhelmingly felt that otolaryngologists could contribute positively to their curriculum, with responses fairly evenly divided between the options of a lecture, clinical rotation, skills laboratory, or demonstrative video.

Regarding the issue of diagnostic examination techniques, most speech pathology trainees (59%) receive

some formal training in either flexible nasopharyngoscopy or rigid laryngoscopy, while 79% of audiology programs include some formal instruction in middle ear otoscopy and cerumen removal. For both speech pathology (60%) and audiology (71%), competency in the performance of such procedures was principally judged via practical evaluation by a nonotolaryngologist.

When asked to judge their trainees' proficiency at coordinating speech therapy with the care delivered by an otolaryngologist for the 3 childhood hearing disorder scenarios, speech therapist directors gave their trainees an average rating of 2.7, with the best rating given to the scenario of a 2-year-old child with a craniofacial syndrome, conductive hearing compromise, and expressive language delay. Audiology program directors gave their graduating trainees an average rating of 3.5, with the best average rating given to the scenario of a 7-year-old child with unilateral profound sensorineural hearing loss.

COMMENT

Including the response of pediatric residency program directors in this study would have been ideal; the refusal of the Association of Pediatric Program Directors to allow their members to be surveyed was disappointing. The comments of the respondent family medicine, audiology, and speech pathology program directors do, however, provide insight into the current status of otolaryngology instruction in these important related disciplines.

In the case of family medicine residency programs, ACGME training requirements appear to be met by the vast majority of the programs that responded to the survey. Family medicine trainees must receive a "structured" and "hands-on" educational experience in otolaryngology, which would ideally be imparted by the clinical rotation that 98% of the responding directors indicated that their programs require. Although there are no specifications as to what exactly is taught to trainees during such clinical rotations, most programs that responded did indicate that their residents received formal training in middle ear disease evaluation with pneumatoscopy, as well as in the interpretation of tympanograms and audiograms. Formalized evaluation by otolaryngology staff was reported by 20% of respondent family practice program directors, with 4 write-in responses indicating that otolaryngologists took part in an "end of rotation" assessment.

Overall, these findings suggest a more defined role for otolaryngologists to play in both the didactic education and the diagnostic skills training of family medicine resident trainees. We believe that such a role is applicable to primary care pediatric residency trainees as well. Both family medicine and pediatric practitioners are often the physicians who are relied on to monitor a child's speech and language developmental milestones and to initially recognize a suspected hearing disorder. Their training should reflect this responsibility. Pediatric ACGME requirements specifically outline diagnostic otolaryngology skills that graduate residents should be comfortable with; such standards should also be in place for family

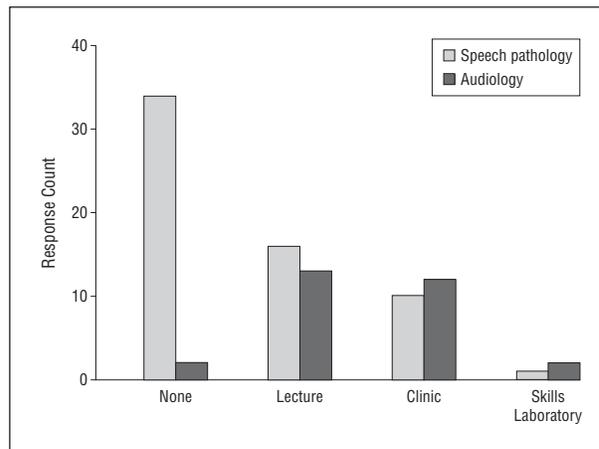


Figure 4. Educational format for teaching otolaryngology in audiology and speech pathology programs (response count in absolute numbers).

medicine training programs. To standardize training among the largest amount of trainees possible, an online curriculum might be helpful. Video-based education could prove especially useful in this respect.⁶ Formalized documentation of the obtainment of diagnostic examination skills is also necessary. Some exemplary means of such documentation already exist.⁷ Similar procedural assessments should be incorporated into curriculum design.

Speech pathology certification requirements emphasize the need for trainees to understand the anatomical and physiological basis behind communication disorders, as well as the need for familiarity with diagnostic examination techniques. The survey results suggest that speech pathology trainees have only occasional clinical contact with otolaryngologists, despite a near-unanimous consensus among responding program directors that their programs could benefit from greater otolaryngology exposure. While 59% of trainees from respondent programs do receive some training in diagnostic examination techniques, documentation of the competent obtainment of such skills is lacking. Skills laboratories would seem to be an ideal means of providing such formalization, but only 1 director indicated that his or her program included this form of training. Several write-in responders thought that the practicum interaction that did occur was sufficient and that there was simply not enough time during training to allow additional otolaryngology exposure. Their response highlights the difficulties of interdisciplinary training and emphasizes the need for practical, time-sensitive formats of instruction. An online otolaryngology curriculum lecture series could prove most feasible in this respect, allowing information to be standardized across the greatest number of speech pathology trainees.

Of the 3 disciplines surveyed, otolaryngologists are currently most actively involved with audiology training programs at both the didactic and the clinical exposure levels. Despite this, only three-fourths of respondent audiology directors indicated that their trainees received formal training in the diagnostic examination techniques outlined in their certification guidelines, and, of these, only one-third reported evaluative confirmation of such skills by an otolaryngologist. If there is an op-

portunity for otolaryngologists to involve themselves further in audiology education, it is probably in the teaching and competence assessment of diagnostic examination techniques. As is the case for speech pathology programs, a greater emphasis on skills laboratories may be appropriate, as fewer than 1% of audiology programs that responded include this type of instruction.

Program directors were asked to rate their graduating trainees' ability to manage 3 specific pediatric hearing disorders requiring multidisciplinary care. Family medicine residents scored the poorest, perhaps reflective of the fact that formalized instruction in the evaluation of congenital hearing loss was reported by only 36% of family medicine directors. Speech pathology trainees fared similarly, whereas responding audiology program directors rated their trainees comparatively much more highly. This disparity in rankings may simply be because hearing disorders are primarily thought to be the purview of otolaryngologists and audiologists. Multidisciplinary education in hearing loss and other common otolaryngology disorders, however, is particularly necessary in this era of the "medical home" model of primary care.

In conclusion, while there is a concerted effort among respondent program directors of all 3 specialties that were surveyed to meet the guidelines set out by their professional societies, the development of a discipline-specific formal otolaryngology curriculum would substantially improve training in each of these fields. Potential mechanisms include traditional offerings such as lecture series and requisite clinic rotations with both pediatric and adult otolaryngologists, ideally augmented by Web-based modules and skills laboratories. There also needs to be a dedicated commitment to competency evaluation relative to the teaching of diagnostic examination techniques. The emphasis on clinical scenarios involving hearing loss reflects the fact that this study was designed to compare the otolaryngology education experience of 3 distinct subspecialty disciplines with shared care responsibility for this childhood handicap. Alternative otolaryngology disorders may highlight differences in educational priorities between disciplines and may serve as a focus of future study.

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Correspondence: Michael J. Cunningham, MD, Children's Hospital of Boston, 300 Longwood Avenue, Lo-367, Boston, MA 02115 (michael.cunningham@childrens.harvard.edu).

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