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ORIGINAL RESEARCH—GENERAL OTOLARYNGOLOGY

Economic, family, and length-of-training issues that influence the selection of a clinician-scientist career path in otolaryngology

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OBJECTIVE: To understand the reasons for the decrease in clinician-scientists in otolaryngology.

STUDY DESIGN: An anonymous survey was prepared that questioned career preparation and personal demographics as well as motive for having done research in medical school. K awardees were also asked for concerns in choosing the clinician-scientist career path and the obstacles encountered.

SUBJECTS AND METHODS: A survey was conducted of the 2005 National Institute of Deafness and Other Communication Disorders otolaryngologist K-awardees and otolaryngology residents from three research-oriented U.S. medical schools.

RESULTS: Residents felt that family issues ranked as a primary concern, followed by the time factor necessary to devote to research that would detract from their family and personal life. The K-awardees' concern also appeared to be family issues; the lack of departmental support ranked second. The K-awardees expressed that protected research time, a mentor, and departmental support were important to success.

CONCLUSION: This survey found that although young otolaryngologists are interested in research, they are deterred by financial and family constraints and a perceived paucity of departmental support.

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The numbers of clinician-scientists in the field of otolaryngology–head and neck surgery are diminishing.[1] Because of the critical importance of translational medicine, the reasons for this decline and recommendations to remedy it were discussed at the Conference on Research Education and Training in Otolaryngology (CRETO) in Washington, DC, in November 2005. To prepare for this conference, the authors surveyed two groups of individuals: otolaryngologists who had joined a faculty and had successfully competed for a K Clinician-Scientist award and otolaryngology residents from three residency programs with a T 32 institutional training award. Due to the nature of this study, no Institutional Review Board approval was necessary.

A career as a successful otolaryngology researcher, just as that of a clinical otolaryngologist, requires intensive and dedicated training. The primary means to obtain the necessary education and training to achieve a career as a clinician scientist include postgraduate education to an advanced research degree (PhD), a mentored clinician-scientist award (K08 or K23), a 1 to 2-year postdoctoral research fellowship, and collaboration with an established scientist (either an MD or a PhD).

Experience has shown that the most successful careers as a funded clinician-scientist are those in which the physician has undergone advanced training culminating in a PhD.[2] Those individuals with the next most successful careers have had a strong track record of a sustained research effort in college, medical school, and residency. The least successful is the physician with a career in academic medicine who embarks on research effort with no background research training.

The otolaryngologist who contemplates a career as a clinician-scientist generally encounters numerous challenges and obstacles along this path. Before initiation of the survey, it was postulated that the more common of these obstacles were poor preparation (paucity of research opportunities in college, medical school, and/or medical residency), shortage of time and resources, absence of a research culture in the department/school, and a lack of mentors to act as role models. Equally common but less frequently acknowledged factors were thought to include concerns about economic security and possible financial loss, spousal issues (including stress, time commitment, and earnings), loss of clinical skills while preparing for and engaging in research activities, the age at which a successful career will begin, and pressure from colleagues to contribute financially and shoulder clinical responsibilities equitably.

METHODS

The first group of physicians surveyed consisted of all current (as of October 2005) otolaryngologist K-awardees of the National Institute of Deafness and Other Communica-

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tion Disorders (NIDCD) of the National Institutes of Health (NIH), all of whom were junior faculty. Sixteen surveys were sent out; 14 were completed and returned. The second group surveyed comprised otolaryngology residents from the medical schools of Washington University, Harvard University, and the University of California, San Diego. Each of these institutions holds an NIDCD-funded institutional Ruth L. Kirschstein National Research Service Award (T 32 training grant), providing research training to residents in otolaryngology. Fifty-three surveys were sent out; 22 responses were received. These programs were chosen because of their stated commitment to the selection of research-oriented residents and with the concurrence of the chairs that their residents could be queried anonymously. The acknowledged limitations of this study are that not every program in the US was surveyed and many academic otolaryngologists emerge from programs without a T 32 funding mechanism.

RESULTS

K-Awardee Survey Results

Demographics. Twelve (86%) of the 14 junior faculty respondents were male; 12 (86%) were married. Nine of the awardees were not practicing in the same department in which they had completed their residencies; five did remain in the department of their residency. Nine had left the department in which they did their fellowships; three had begun their careers in the department in which they received their fellowship training; two did not pursue fellowships.

Education. Two (14%) of 14 respondents had an advanced degree in research (PhD or equivalent). Three (21%) respondents either did extended postdoctoral study or worked in the biotechnology field for an extended period of time before residency. Twelve (86%) pursued a formal postresidency subspecialty otolaryngology fellowship; of these, otology/neurotology was the fellowship selected most, followed by pediatric otolaryngology.

K-award. On average, those surveyed were 2.8 years into the K-award. Nine (64%) of 14 were funded on their first K-award submission; after one revision, 100 percent had been funded. Eight (57%) of 14 participated in an NIH-sponsored T32 during their residency. Four (50%) had a one-year T32 appointment; four (50%) had a two-year T32 research experience. All of the K-awardees felt that the K-award will benefit their academic career. Two (14%) of the 14 went on to obtain R01 funding; two (14%) applied but were not funded; 10 (71%) had not yet applied for an R01 grant. The total number of peer-reviewed publications that resulted from these 14 K-awards was 63 (range, 0 to 21; mean, 4.5; median, 2).

Salary. In order to determine the AAMC salary scale benchmark for all K awardees surveyed, the respondents were asked their current academic rank and total salary. The assistant professor range was $160,000 to $210,000 (mean, $180,625, 40% AAMC; median, $175,500, 25% to 30% AAMC). The associate professor range was $206,000 to $354,000 (mean, $258,333, 56% AAMC; median, $215,000, 25% to 30% AAMC).

Nine (64%) respondents thought that their salary was on par with the primarily clinically focused faculty (those involved in clinical practice >75% time) of the same rank in their department; three did not think so; two did not know. Seven (50%) awardees reported that their guaranteed salary does not require their department to subsidize them beyond what the NIDCD salary contribution provides plus what they can generate clinically (ie, the awardee does not create a deficit for the department); three reported that they do create a deficit for the department; two did not know; two did not respond.

Allocated clinical time. Eleven (79%) of the 14 awardees responded that they feel pressure from peers or other faculty members to work more than the 25 percent allotted time in clinical medicine.

Perceived obstacles. On a scale from 1 (most important) to 5 (least important), the major concern (currently and/or previously) in taking the clinician-scientist career path chosen was (in order of ranked importance) as follows:

- Family (spousal)-related issues: 57 percent ranked this as 1 or 2; 36 percent ranked it as 1.
- Lack of departmental support for my career as a clinician-scientist: 46 percent ranked this as their major concern (1 or 2).
- Losing clinical skills over time with a 75 percent research commitment: 36 percent ranked this as 1 or 2.
- Potential loss of income: 36 percent ranked this as 1 or 2; 21 percent ranked it as 1 (most important).
- Length of time it would take to get career started (ie, age): none of the faculty ranked this as the primary concern; 50 percent ranked it as 2 or 3 in importance; 50 percent rated it as least important (4 or 5).

Resident Survey Results

Demographics. Sixteen (73%) of the 22 resident respondents were male; ten (45%) were married.

Research education background. Of the 22 surveys returned, 19 (83%) residents did research as medical students. Their reasons for having done so, ranked in order of importance from 1 (most important) to 5 (least important) were the following:

- Research is an important aspect of medicine for me and I wanted to contribute and learn: 55 percent ranked this as most important (1); 77 percent ranked it 1 or 2.
- Residents I met in O–HNS told me to do it, so I followed their advice: 23 percent ranked this their most important

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reason (1 or 2); 59 percent ranked it as least important (4 or 5).
- Research is a "requirement" to obtain a residency in O-HNS, so I had to do it: 9 percent gave this as their primary reason (1); 18 percent ranked it 1 or 2.
- Research enabled me to get to know a faculty member well so that I could get a good letter of recommendation: 0 percent ranked this most important (1), but 41 percent ranked it as 2; 23 percent ranked it as 3; and 23 percent felt this was the least important reason (4 or 5).
- Research gave me time to do my interviews and relax a bit: 0 percent ranked this 1 or 2; 68 percent ranked it 4 or 5.

Education and career plan. Two (9%) of the 22 residents had an advanced degree in research (PhD); 45 percent participated or were scheduled to participate in an NIH-sponsored T32 program during residency; 14 (64%) planned to pursue a clinical fellowship; eight (36%) were not sure. The subspecialty selected most often for fellowship training was otology/neurotology, followed by an equal distribution across general otolaryngology, pediatric otolaryngology, and facial plastics. Forty-one percent of the residents were planning a career in academics with a basic science research laboratory; 23 percent of them anticipated an academic career that was primarily clinical and teaching. None of the residents responded that they were considering a career of 100 percent private practice, although three (14%) listed private practice with a teaching appointment at a university as their anticipated career. None of the residents were planning on a career in an organized multispecialty medical group. Two (10%) of the residents failed to select any of the choices given; two (10%) others selected academics but had not decided between a basic science research laboratory and primarily clinical and teaching.

Perceived obstacles. The residents were asked to rank, in order of importance from 1 (most important) to 6 (least important), their primary concerns when considering a career as a clinician-scientist.

- Length of time it would take to get career started (ie, age): 50 percent rated this as their most important concern (1 or 2); 23 percent rated it as the least important (4-6).
- Family (spousal) related issues: 45 percent rated this 1 or 2; 36 percent rated it 4 or 5.
- Would rather do a clinical fellowship, and the added training for research will be too long: 32 percent rated this is their most important reason (1 or 2); 36 percent called it their least important reason (4-6).
- Do not have the training or background to be a clinician-scientist: 32 percent indicated that this was their primary concern (1 or 2); 59 percent rated it as their least concern (4-6).
- Potential loss of income was rated as the most important reason (1 or 2) for 18 percent of the residents surveyed, and the least important reason (4-6) for 50 percent.
- Do not find research interesting or rewarding: one resident (5%) listed this as a 1 or 2 in importance; 14 percent called it a 3 or 4. 79 percent ranked this as the least important concern (5 or 6).

DISCUSSION

In the analysis of the surveys returned, it must be stressed that the data represent the opinion of only a minority of the total number of residents currently being trained in otolaryngology. Recognizing this, the authors tried to select three programs with a stated commitment to producing clinician-scientists and that had a funding mechanism through a T 32 to encourage an academic career among their trainees. Clearly, many programs exist without this funding mechanism that produce the majority of academicians in this specialty. The authors recognizing these limitations, present the data only as a snapshot of current perceptions of these trainees and K awardees. The residents' comments on the impediments to establishing a career as a clinician-scientist were enlightening but not wholly unexpected. It was interesting, however, to find that only one of the 22 residents cited "I do not find research interesting or rewarding" as his/her primary deterrent to a career as a clinician-scientist, while 17 of 22 completely disagreed with this statement. With such a high rate of interest and satisfaction in this aspect of a career, why are the numbers of otolaryngology clinician-scientists continuing to decline?

Family/spousal issues ranked as a primary concern for the residents surveyed. The time factor weighed heavily into the mix for residents, as they overwhelmingly seemed to perceive research as an activity that requires additional time beyond the regular work week, and for which they will need to carve out time from their personal lives. Although financial considerations ranked low on both the junior faculty's and the residents' lists, the number of comments that expressed financial concerns showed it to be a viable issue, particularly when it is linked to family and spousal concerns that ranked quite highly in the survey.

The junior faculty felt, in retrospect, that protected research time and a mentor, as well as departmental support, were of paramount importance to success on the clinician-scientist career path. Even the guarantee of protected time, however, does not obviate frequent interruptions due to clinical demands; moreover, the setting aside of "protected research time" often means longer work hours in order to keep up with clinical responsibilities.

As stated by several individuals, the importance of having witnessed a successful role model or mentor navigate through the many perceived obstacles that face a clinician-scientist career is a tremendous value to those who face such a career decision. However, as fewer and fewer clinician-scientists populate the academic faculties in surgical subspecialties, role models will become increasingly difficult to find.

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The K-awardees' major concern appeared to be family/spousal–related issues, with the lack of departmental support ranked second. The first issue is completely justified, and no foreseeable programmatic changes in the NIH K-award can alter this. The lack of departmental support, however, is a concern that may be addressable. One of the recurring comments by the awardees was their perception that the 75 percent time requirement in research was a detriment to their careers, not only because it is viewed poorly by their peers, but also because they are not generating revenue or developing a viable clinical practice. Several responders suggested that the time commitment be decreased as one progressed along the 5-year tenure of the grant, starting at 75 percent and reducing it to 50 percent as one goes along, so that a productive clinical career can be nurtured simultaneously with a research trajectory. This has an added benefit in that the department with a clinician-scientist whose K award is terminating suddenly has a salary requirement that is substantial without a mature clinical practice to support it. This, we believe, is a crucial issue that requires dialogue from all concerned parties. Perhaps an option for a graduated percentage of K-award professional effort could be discretionary, at the request of the awardee, and with the approval of the mentor, after one or two years of enrollment in the K-award research career development program. Only a few comments were raised about a delay in career start-up and the potential for lost income or retirement benefits. If the required percentage of time in research were reduced, as has been done by a few of the NIH institutes that serve surgeon-scientists, then contributions to salary and retirement benefits would also be thereby addressed and perhaps decrease the concern that K-awardees are falling behind their peers and putting themselves at a disadvantage later in life.

The residents surveyed voiced an overwhelmingly positive sentiment toward research. They downplayed its value as an unstated requirement to obtain a residency in otolaryngology and felt it was an important component of their biomedical education and an opportunity to get to know a mentor in their chosen field. Of the perceived obstacles, the order of importance was length of time to get their careers started, family/spousal-related issues, and preference to spend the time doing a clinical fellowship. Many of the comments raised the concern that clinical departments favored individuals who generated clinical revenue compared with research productivity. Many also were sensitive to the issue that in order to compete successfully with full-time research faculty for funding, one had to devote the necessary substantial amount of time to this component of one's career, yielding the potential for two equally demanding careers. Unfortunately, this is a reality with the very keen competition that currently exists for federal research dollars and the high expectations of NIH study section reviewers, the large majority of whom are PhD-trained scientists. The NIH has made no systematic efforts to distinguish applications of MDs who propose basic science or clinical research from those of PhDs at the initial scientific and technical review, second-level (Advisory Council) review, or funding stages of the granting process. We believe that one solution to this that is sometimes used is for the MD to become partners in research with a PhD who shares a common research interest. There are numerous advantages to such a liaison for both parties involved.

Recent data by Dickler et al[2] demonstrates that MD-PhD applicants, as a group, fare better than MDs in competing for both initial R01s and subsequent R01s. In addition MD-PhD applicants had a higher percentage of first-time K awards when compared with MDs who applied. Given the data reported in this survey from the field of otolaryngology, only two (14%) of the K awardees had an advanced research degree. Furthermore, if the data from the Dickler report are applied to otolaryngology, then the surveyed group of K-awardees will certainly be at a disadvantage when they ultimately apply for their first R01.

Also gleaned from the survey is that, of those individuals who currently have K-awards, 57 percent participated in a T32 institutional training award. Of those, 50 percent did one year of research on a T32 and 50 percent did two years of T32-supported research. The NIH requirement for two years for the T32-based research training of health professionals could be called into question by this finding, since the one-year and two-year T32 trainee graduates surveyed here demonstrated equal success in subsequently obtaining a K-award. Although these are small numbers, the issue of the duration of training is relevant to those who choose an academic clinician-scientist track. Indeed, a two-year research training program during residency, appreciably prolonging clinical training, may serve as a disincentive for choosing a research career trajectory. The purported value, or necessity, of the two-year T32 experience to the nurturance of otolaryngologist clinician-scientists should be tested rather than presumed or extrapolated from dated NIH data sets that involved predominantly nonsurgical MDs.

CONCLUSION

A limited survey such as this cannot produce far-reaching conclusions or recommendations, but it can begin to focus our attention on this looming crisis in our specialty. Without clinician-scientists, our specialty will continue to exist, but the scientific questions raised and research performed will have a different look in the years to come. Recognizing this, the American Academy of Otolaryngology–Head and Neck Surgery and other subspecialty societies have in recent years tried to foster research opportunities for residents and medical students through various grant programs. The

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awareness of these programs has been uneven and should filter down to medical school deans' offices and residency program directors in a more deliberate fashion. Moreover, the authors believe that numerous obstacles are being placed in the way of programs that are interested in helping to address this problem at a local level. For instance, there is an unalterable requirement of the current Residency Review Committees (RRC) that programs maintain an orderly graduation of residents. This inflexibility often makes a sustained and meaningful research experience for a resident difficult, if not impossible, since when a resident comes back into clinical rotations there are often too many residents graduating in a given year, which is a violation of the current RRC regulations. It is doubtful that the addition of an additional resident to the clinical rosters poses a real problem in the clinical training of residents. In order to foster clinician-scientist training, there must be greater sensitivity to this critical need in surgical subspecialties, so that we don't exacerbate the shortage of clinician-scientists in otolaryngology. The talent pool for otolaryngology training programs has never been richer, and the leadership of our specialty needs to focus on how to channel these bright individuals into productive careers as clinician-scientists.

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Jeffrey P. Harris, study design, data collection and writer; **Melanie L. Ariessohn,** data collection and writer.

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