Better Than Buffett?

A Report on the Success of the American Head and Neck Society Research Grant Program

Michael E. Kupferman, MD; Daniel J. Moskovic, MA; Randal S. Weber, MD; Jay Boyle, MD

It has been well established that a crisis exists in the biomedical research enterprise of clinical surgery departments: the extinction of the surgeon-scientist. A number of factors, including dwindling research funding, decreasing reimbursement from insurance providers, shrinking salaries for researchers, waning interest in academia among graduating residents, and financial pressures on departments for greater clinical productivity, have contributed to this phenomenon in recent years.1 More importantly, the growing number of basic scientists who are competing with clinicians for investigator-initiated funding from the National Institutes of Health (NIH), along with the competitive advantage of clinicians from internal medicine specialties for these funds, has led to fewer awards to surgeons for research funds.2 The downturn in the United States economy in 2008 has made these issues more pronounced, threatening the viability of many academic medical centers and the research enterprise in many surgical departments.

Despite attracting a very talented pool of medical students, the field of otolaryngology–head and neck surgery has not been spared from the trends that have been experienced by surgeons in general. Specifically, NIH funding of otolaryngology research had declined relative to the overall NIH fund allocation.3 As of the mid-1990s, otolaryngology-based publications cite funding sources approximately 30% of the time, implying that more than 70% of research within the field was unfunded. Although these figures are consistent with other surgical subspecialties, it is clear that an overwhelming fraction of otolaryngology research is unfunded. Furthermore, the trends of the preceding years indicate that NIH funding has diminished over time.

In response, various suggestions on how public and private institutions can facilitate the development of surgical scientists from the outset of their training have been proposed and studied.4-8 These initiatives have led to the development of institutional and national programs that are designed to cultivate and support research interest. The American Head and Neck Society (AHNS) has been one such purveyor of research promotion and professional development.

One of the primary missions of the Research and Education Foundation of the American Head and Neck Society is “to assure that adequate financial support will always be available to enable the Society to achieve its objectives to fund and otherwise encourage basic science and clinical research in head and neck oncology.” Similar to other otolaryngology societies, the AHNS offers a number of research grants to residents, fellows, and academic faculty members through its Research Grant Program (RGP). More than $500 000 has been awarded over the past 10 years through these funding mechanisms.9 Yet, despite these and other funding programs, retention of residents and faculty in head and neck oncology research remains stagnant, and proper use and distribution of these funds must be critically evaluated.6

In this climate of economic crisis and shifting medical resource prioritization, it...
is imperative that the AHNS and other otolaryngology societies ensure responsible stewardship of their research funds.11,12 Although regarded as successful on the basis that AHNS-RGP–sponsored research has been published in peer-reviewed journals, the degree to which this program or any similar granting agency has achieved its stated missions has not been explored.13 The objective of this study was to evaluate the success of the AHNS-RGP in supporting the development of young head and neck surgeon-scientists.

### METHODS

An e-mail survey was sent to all past recipients of any AHNS grant awarded from 1998 to 2007. Data were analyzed anonymously, and success was determined by overall publication record, continued scientific activity, and the receipt of additional grant support (Table 1). Descriptive statistics were used to summarize the characteristics of the cohort. The survey was sent to 27 recipients, 18 of whom responded. Nonresponders included some individuals who transitioned to international practices or were in the midst of an academic transition and could not be reached. One responder received 2 AHNS grants. All percentages are expressed as a function of the number of responders (n=18).

The total AHNS-RGP award values were tallied, and the annualized investment (AI) was defined as the amount of AHNS funds distributed per award year and was calculated according to the following formula: $AI = \frac{\text{Total AHNS Funds Distributed}}{\text{Total Award Years}}$. Subsequent research funding that was awarded as a direct result of the initial AHNS-RGP funds was defined as a secondary investment (SI). The SI was normalized for grant duration and was defined as a secondary annualized investment (SAI) and was calculated as follows: $SAI = \frac{SI}{\text{Total Award Years}}$. The relative return (RR) on the AHNS-RGP was calculated as follows: $RR = \frac{SAI}{AI}$.

Data on the Standard & Poor’s 500 Index, Dow Jones Industrial Average, Spot Gold, Vanguard Total Stock Market Index, US Treasury Bonds, and Berkshire-Hathaway, Inc, were obtained from Bloomberg L.P. (http://www.Bloomberg.com) and from Yahoo! Finance (http://www.finance.yahoo.com). Statistical analysis was performed with SPSS statistical software (SPSS Inc, Chicago, Illinois).

### RESULTS

To accurately assess the success of the AHNS-RGP, we focused on 3 key milestones in the career of the grant recipients: (1) publication in peer-reviewed journals, (2) continued engagement in research activities, and (3) success in securing grants from other funding sources (Table 1). The following tabulation presents an overview of 18 AHNS-RGP awardee achievements, including other grants awarded over the AHNS-RGP study period, professional direction, and research productivity as assessed by subsequent grant awards and publications:

### PEER-REVIEWED PUBLICATIONS

Of those recipients who responded to the survey, 12 (67%) reported having their AHNS-funded work accepted for publication in a peer-reviewed journal, and 4 had 2 or more publications. A precise number of publications was not evaluable from the survey. The landscape of journals ranged from the major otolaryngology journals (eg, the Archives and Laryngoscope) to high-impact cancer biology publications (Cancer Research and Clinical Cancer Research).

An analysis of the publication record for each grant mechanism was performed to assess the ability of recipients to achieve expected benchmarks. The highest-yielding mechanisms were the Surgeon-Scientist Award (3 of 3) and the AHNS-ACS (American College of Surgeons) Award (2 of 2), which had 100% publication rates.

### CONTINUED RESEARCH ACTIVITIES

Engagement in laboratory or translational research was reported by 14 respondents (78%), with 10 recipients (56%) serving as principal investigators of their research programs. The remaining 4 reported active collaborations with other investigators. Seventeen of the responders (94%) continue to pursue clinical research.

To quantify the commitment to continued laboratory and translational research, the percentage of professional time devoted to research was determined. The
majority of active investigators (>50%) had a 25% to 75% research effort commitment, with 4 surgeons spending half of their time in scientific endeavors (Figure 1). Because of the small number of responders, no correlation was noted between the type of grant received and the reported research effort.

NEW FUNDING

To assess the economic value of the AHNS-RGP funds, the RR of the AHNS-RGP investment was studied by comparing AHNS “investment” with the achievement of an SAI in the form of subsequent grant support. Of the responding awardees, 11 (61%) received subsequent grants from other sources, funding that resulted directly from their initial AHNS-supported research. A total of 28 new grants were funded as a result of the initial AHNS-RGP awards, with 8 NIH-sponsored grants. Half of all grant awardees (9 of 18) received 2 or more new grants (Table 2).

During the study period, the AHNS-RGP awarded $494,000 for a total of 28 grant-years, with an AI of $17,643 (Table 3). Of the 28 grants that were awarded to the 18 responders, 19 had available financial data on which our analysis is based. The value of these 19 awards that directly resulted from AHNS-funded research totaled $7,998,000, which was distributed over 57 grant-years, for an SAI of $140,316 (Figure 2). Grant recipients successfully leveraged their funds to secure $122,673 in additional funding per grant-year. Therefore, the ANHS and its awardees enjoyed an RR of 639% of funding per grant-year (P < .001).

Figure 3 compares the returns of the AHNS-RGP with various equity, commodity, and fixed-income investments from July 1, 1998, to June 30, 2008. To compare these benchmark financial returns with AHNS-RGP awards, we measured the returns of a portfolio containing only 1 of the aforementioned assets, in which investment amounts equivalent to AHNS-RGP awards were made on the first trading day of July of the same year. The value of the portfolio for each asset was examined on June 30, 2008, and a simple return on investment was calculated. The AHNS-RGP awards resulted in secondary grants that were more than 3.5-fold greater in value than an investment in the best-performing asset class of the same period.

In this study, we showed that the AHNS-RGP has been successful in its goal of fostering research and career de-

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Table 2. Secondary Grants Received by American Head and Neck Society Research Grant Program (AHNS-RGP) Awardees

<table>
<thead>
<tr>
<th>Grant Title</th>
<th>No. of Awards</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01/R21</td>
<td>2</td>
</tr>
<tr>
<td>K08</td>
<td>3</td>
</tr>
<tr>
<td>SPORE</td>
<td>3</td>
</tr>
<tr>
<td>Veterans Affairs Merit</td>
<td>1</td>
</tr>
<tr>
<td>American Cancer Society</td>
<td>1</td>
</tr>
<tr>
<td>American Society of Clinical Oncology</td>
<td>1</td>
</tr>
<tr>
<td>Institutional awards</td>
<td>6</td>
</tr>
<tr>
<td>Otolaryngology—Head and Neck Surgery Foundations</td>
<td>3</td>
</tr>
<tr>
<td>Government awards (non-NIH, state, military)</td>
<td>2</td>
</tr>
<tr>
<td>Private/pharmaceutical awards</td>
<td>3</td>
</tr>
<tr>
<td>Flight Attendant Medical Research Institute</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
</tr>
</tbody>
</table>

Abbreviation: NIH, National Institute of Health.

*Based on AHNS-RGP–funded research.

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Table 3. Overview of Initial and Secondary Grant Awards

<table>
<thead>
<tr>
<th>Award Type</th>
<th>Total</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHNS-RGP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of awards</td>
<td>18</td>
<td>NA</td>
</tr>
<tr>
<td>Grant-years</td>
<td>28</td>
<td>NA</td>
</tr>
<tr>
<td>Total value, $</td>
<td>494,000</td>
<td>NA</td>
</tr>
<tr>
<td>Secondary funds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. of awards</td>
<td>19</td>
<td>6</td>
</tr>
<tr>
<td>Grant-years</td>
<td>57</td>
<td>119</td>
</tr>
<tr>
<td>Total value, $</td>
<td>7,998,000</td>
<td>639</td>
</tr>
</tbody>
</table>

Abbreviations: AHNS-RGP, American Head and Neck Society Research Grant Program; NA, not applicable.

*Comparison of AHNS-RGP awards with subsequent grants awarded on the merit of the AHNS-sponsored research.

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Figure 1. Distribution of research effort as a fraction of clinical and academic involvement at the time during which survey responses were recorded.

Figure 2. Comparison of initial American Head and Neck Society Research Grant Program (AHNS-RGP) awards to secondary grant awards for which financial data were available.

Figure 3 compares the returns of the AHNS-RGP with various equity, commodity, and fixed-income investments from July 1, 1998, to June 30, 2008. To compare these benchmark financial returns with AHNS-RGP awards, we measured the returns of a portfolio containing only 1 of the aforementioned assets, in which investment amounts equivalent to AHNS-RGP awards were made on the first trading day of July of the same year. The value of the portfolio for each asset was examined on June 30, 2008, and a simple return on investment was calculated. The AHNS-RGP awards resulted in secondary grants that were more than 3.5-fold greater in value than an investment in the best-performing asset class of the same period.

In this study, we showed that the AHNS-RGP has been successful in its goal of fostering research and career de-
development in head and neck oncology, based on 3 critical metrics. First, the publication record of the funding program approaches 100% for certain mechanisms, and important advances in understanding the biology of head and neck cancer have been gleaned from studies supported by these resources. Second, the low attrition rate from laboratory-based research and the high level of active engagement at the primary investigator level confirm the role that these grants play in career development. Third, the significant secondary infusion of funding from various sources suggests that AHNS-RGP funds are appropriately allocated to individuals who are pursuing relevant basic science research that is of interest to the medical community.

Also, we showed that the value of research time for AHNS-RGP awardees increases dramatically after receipt of their initial reward. Investigators who were awarded $17,643 per grant-year achieved a secondary investment of $140,316 from other funding agencies. The RR on the value of 1 grant-year was 639%, which implies that researchers were receiving more than 6 times their initial AHNS-RGP funding for each grant-year of research. The value creation of the AHNS-RGP can be compared with a portfolio that is composed of a single asset with investments that parallel AHNS-RGP distributions over the same period. The value of such a portfolio composed only of gold would have increased by 177%, while Standard & Poor’s 500 Index achieved only a 19% return. Investment in Warren Buffett’s Berkshire Hathaway would have increased by only 69% over the same period. Although investment in fixed assets and equities cannot be directly compared with grant allocation, the significant RR achieved for AHNS-RGP awardees indicates that a rigorous selection process is achieving the goal of facilitating the professional development of the surgeon-scientist. Recipients of the awards are active in publishing, pursue careers in basic and translational science research, and predicate subsequent funding opportunities on their AHNS-RGP awards.

These results compare with those of a study conducted at the University of Minnesota Academic Health Center, Minneapolis, where 2 internal grant programs were initiated with the intention of financing preliminary research to support secondary grant funding. Over the 6-year period for which their grant programs were analyzed, investigators returned 560% and 237% in the SAI for the Seed and Faculty Research Development grant programs, respectively. Similar to our study, the University of Minnesota’s study of grant mechanisms that identify emerging researchers and investigational opportunities has demonstrated efficacy in cultivating subsequent grant opportunities.

Various studies have evaluated the determinants of career trajectories for graduating senior residents. In particular, most otolaryngology residents expressed interest in continued research but chose to pursue careers in clinical medicine, often citing financial and family factors as the primary determinants of their decisions. Similarly, otolaryngology department chairpersons place a high value on research but find that training programs are limited in the amount of time that residents can commit to a meaningful research experience. Our findings suggest that identifying selected research-oriented surgeons early in their careers and providing them with the necessary funding and protected time can lead to academic, financial, and scientific successes.

Although recent studies suggest that medical students are in favor of pursuing research-oriented careers, other data suggest that current trends of young faculty members and current residents do not reflect this trend. In response, many institutions and professional organizations have developed focused grant opportunities and research mentorship programs to foster the development of future physician-scientists. Other suggestions to encourage participation of surgeons in research include (1) easing the required research time commitment in the K08/K23 programs, (2) providing matching salary funds through professional organizations to offset the need for clinical productivity, (3) facilitating research during both early- and late-stage clinical training, and (4) continued development of combined MD/PhD programs.

The disproportionately slow rise of funds for surgical research, compared with the total research community, can be assessed using NIH funding data as a proxy for research interest. Overall, the rate of NIH applications from surgeon-scientists grew 67.3% from 1982 to 2004, compared with a 124.1% rise in total (including nonclinician) applications in the same period. Awards to surgeon-scientists grew 41.4%, compared with a 71.2% increase in total awards. These findings suggest that funding agencies and those committing to a surgical career undervalue the role of the surgeon-scientist.

The limitations of our study include the inability to determine the relative role of the AHNS-RGP, as compared with other grants that the investigator might have used, in developing the platform for secondary funding. The use of grant-years as a basis of comparison does not account for the fraction of time that the investigator dedicated to research supported by a specific grant, as compared with time spent working on other clinical or...
basic science activities. Also, 9 of the 27 awardees (33%/3% of the grant recipients) were nonresponders to the survey. Finally, awards are granted annually, and recent awardees may not have been able to complete the necessary processes to achieve publication or subsequent grant funding.

In conclusion, we attempted to determine the success of a single grant program targeting trainees and young professors of a surgical subspecialty by assessing the SAI, research retention, and contribution to scientific literature. Our assessment is that the AHNS-RGP has been successful in identifying individuals whose interests and goals are in alignment with the goals of the AHNS. We also compared the RR on the AHNS-RGP grants by comparing the SAI with common benchmarks of financial return over the same period and identified acceptable “profits.” Retrospective analyses of similar research grant programs will allow funding agencies to critically assess whether they have been successful in their stated research objectives and may provide the necessary metrics to determine the ability of other research programs to cultivate productive surgeon-scientists.

Submitted for Publication: August 26, 2009; accepted August 26, 2009.

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Author Contributions: Dr Kupferman had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analyses. Study concept and design: Kupferman, Moskovic, and Boyle. Acquisition of data: Kupferman. Analysis and interpretation of data: Kupferman, Moskovic, and Weber. Drafting of the manuscript: Kupferman, Moskovic, and Boyle. Critical revision of the manuscript for important intellectual content: Kupferman, Moskovic, and Weber. Statistical analysis: Kupferman and Moskovic. Obtained funding: Kupferman. Administrative, technical, and material support: Kupferman and Moskovic. Study supervision: Kupferman, Weber, and Boyle.

Financial Disclosure: None reported.

REFERENCES

Financial Disclosure: None reported.

Previous Presentation: This study was presented in part at the American Society of Pediatric Otolaryngology Annual Meeting; May 25, 2009; Seattle, Washington.

Additional Contributions: We acknowledge Carol Stocks, Agency for Healthcare Quality and Research, for the review of the manuscript and the integrity of the sampling.

REFERENCES


Correction

Error in Text. On page 1084, in the first sentence of the second paragraph of the “New Funding” section in the Original Article titled “Better than Buffett? A Report on the Success of the American Head and Neck Society Research Grant Program” by Kupferman et al, published in the November issue of the Archives (2009;135[11]:1082-1086), 28 grant-years should be 26 grant-years and $17 643 should be $19 000. The correct sentence should read as follows: “During the study period, the AHNS-RGP awarded $494 000 for a total of 26 grant-years, with an AI of $19 000 (Table 3).”