Can Future Academic Surgeons be Identified in the Residency Ranking Process?

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OBJECTIVE: The goal of surgical residency training programs is to train competent surgeons. Academic surgical training programs also have as a mission training future academicians—surgical scientists, teachers, and leaders. However, selection of surgical residents is dependent on a relatively unscientific process. Here we sought to determine how well the residency selection process is able to identify future academicians in surgery.

DESIGN: Rank lists from an academic surgical residency program from 1992 to 1997 were examined. All ranked candidates' career paths after residency were reviewed to determine whether they stayed in academics, were university affiliated, or in private practice.

SETTING: The study was performed at New York Presbyterian Hospital—Weill Cornell Medical College, New York, NY.

PARTICIPANTS: A total of 663 applicants for general surgery residency participated in this study.

RESULTS: In total 6 rank lists were evaluated, which included 663 candidates. Overall 76% remained in a general surgery subspecialty. Of those who remained in general surgery, 49% were in private practice, 20% were university affiliated, and 31% had academic careers. Approximately 47% of candidates that were ranked in the top 20 had ≥ 20 publications, with decreasing percentages as rank number increased. There was a strong correlation between the candidates' rank position and pursuing an academic career (p $<$ 0.001, $R^2 = 0.89$).

CONCLUSIONS: Graduates of surgical residency who were ranked highly at the time of the residency match were more likely to pursue an academic career. The residency selection process can identify candidates likely to be future academicians. (J Surg Ed 73:788-792. © 2016 Association

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INTRODUCTION

The goal of surgical residency training programs is to produce competent surgeons. An additional goal held by academic surgical training programs is to train future surgeons who would pursue a career in academics. Residents who are trained at these programs receive instruction from surgeons who are seeking academic promotion, routinely perform research, and serve as leaders in their field. During training, it is often encouraged or mandated that residents in academic programs complete research fellowships, present at national meetings, and publish in peer-reviewed journals. Successful completion of these requirements may ensure the resident gets the fellowship position of their choosing, a pathway now pursued by the most of graduating residents[1]; however, the larger goal of these programs is to train academic surgeons who would serve as the next generation of surgical scientists, teachers, and leaders.

It is a daunting task to select future academic surgeons; however, the methods employed during the interview season to select surgical residents remain relatively unscientific. There have been multiple studies examining the qualities commonly looked for in applicants, such as high United States Medical Licensing Examination (USMLE) scores, membership in the Alpha Omega Alpha honors society, and research during medical school, and their correlation with eventual clinical performance of matched residents.[2,3] These studies have largely found that these criteria succeed in predicting those who would perform well on standardized tests, but have little ability to predict who

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would perform well clinically during residency. Many of these studies call for more standardized methods of choosing resident candidates.[3,4]

However, there has been little investigation into what happens after residency is completed. Currently, no studies have formally looked at whether it is possible to predict career paths after residency based on the resident application. The true measure of whether programs are succeeding in training the types of surgeons that they aim to produce depends largely on what sort of careers residents pursue after their training. Therefore, in this study we aimed to determine whether the current method of selecting residents for admission to an academic training program adequately predicts who would pursue a career in academic surgery.

MATERIALS AND METHODS

Rank lists from a single academic institution over a 5-year period (1992-1997) were reviewed. Each rank list provided the candidate's name, the order in which they were ranked by our institution, the program where they attended medical school, the program at which they matched, and what kind of residency program they matched into (general surgery, plastic surgery, internal medicine, etc.). Each individual on the list was investigated via internet and PubMed search to determine the following:

1) the current position held by the candidate;
2) whether they were still in general surgery or a subspecialty of general surgery, including general surgery or trauma, cardiothoracic surgery, transplant, surgical oncology, vascular, breast, plastic surgery, colorectal, bariatric or upper gastrointestinal surgery, endocrine surgery, or pediatric surgery; and
3) the number of publications authored by the candidate as available by PubMed search.

Based on these data, a determination was made as to whether the candidate was currently in private practice, had an academic career, or was a university-affiliated surgeon. Surgeons in private practice were defined as those who did not have an academic designation of professor, associate professor, assistant professor, or clinical instructor and did not work at a university hospital affiliated with either a medical school or a residency program. Academic surgeons were defined as those who had a designation of professor, assistant professor, or associate professor who had at least 20 publications, which is approximately 1 publication per year that would be required to maintain academic standing (although most programs require far more than that). The third category of university-affiliated surgeon included those who worked at a university hospital that was affiliated with a medical school or residency program, but did not meet the above criteria.

Each rank list was broken into groups of 20 applicants and analyzed to determine the percentage of applicants in each group that were in academic positions. Correlation between the candidate's position on the rank list and their eventual career choice was determined. p Values were calculated using Pearson chi-squared test or linear regression analysis, as appropriate. $p < 0.05$ was considered statistically significant. All statistical analyses were performed using STATA 12.0 (College Station, TX).

Resident Selection Criteria

Our academic general surgery residency program receives more than 1000 applications each year for 8 categorical residency positions. Candidates are invited for an interview based on review of their application, with an emphasis placed on performance in the USMLE examinations and on the performance of selected third-year clerkships. A total of 2 interview days are held, with approximately 100 confirmed candidates coming to the interview, 50 on each day.

On the interview day, the candidates are broken up into "teams" of approximately 8 candidates each. Each candidate on the team is interviewed by the same 4 interviewers. Each interviewer is given a packet with the candidate's complete application and a cover sheet. The cover sheet is to be filled out about each candidate and gives them a score of 0 to 5 in the categories of academics (i.e., medical school grades and USMLE board scores), publications or research, letters of recommendation, community service, the interview, and overall fit to the institution, with a space for additional comments. After the 4 interviews are complete, the interviewers meet together to discuss their impressions of the candidates, and whether they should be ranked in the top 10, top 20, top 30, etc.—or not at all. The scores in each category are summed and the rank list then generated. If during the interview process a candidate is ranked as a "Top 10," then that can move them up on the list even if their total score does not place them into the top tier. Conversely, if they are ranked poorly at the interview, this can move them down the list. This highlights the importance of the interview in the overall process.

Each team then has a representative team leader that goes to a larger meeting with the other team leaders, the Chairman of the Department, and the Program Director, who have had the opportunity to interview all candidates. The team leaders then discuss each candidate and their recommendations for ranking, and these are discussed by the group. Those selected to be team leaders must be available to interview at both interview days, and therefore at the completion of the interview season would have had the opportunity to meet 16 of the 100 total candidates. After the second interview day, the team leaders are asked to rank the candidates they have interviewed 1 to 16, and then a preliminary rank list is made using each team leaders first