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Academic or community practice? What is driving decision-making and career choices

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Abstract

Background—Identifying factors that impact progression of surgery trainees into academic versus non-academic practices may permit tailoring residency experiences to promote academic careers in institutions charged with the training of future surgeon scientists. The aim of this study was to identify factors associated with progression of surgery trainees into academic versus non-academic practice.

Methods—A survey was distributed to 135 surgeons graduating from the University of Virginia residency program from 1964–2016, a single academic institution. Questions addressed practice type, research productivity, work/life balance, mentorship, and overall sentiment toward research and academic surgery. A 5-point Likert scale measured career satisfaction and influence of factors in practice setting choice.

Results—Of the 135 surveys that were electronically distributed, 69 participants responded (response rate: 51%). Of the 54 with known current practice types, 34 (63%) were academic and 20 (37%) non-academic. Academic surgeons reported more publications by the conclusion of surgery training (56% vs 25% with >10 publications, $P = .02$). More academic surgeons reported > \$100,000 in student debt at graduation (44% vs 25%, $P < .05$). Factors encouraging an academic career were similar for both types of surgeons, including involvement in education of trainees and access to mentorship. Both groups were discouraged from an academic practice by requirements of grant-writing and funding responsibilities. Surgeons in academic practice were more likely to recommend surgery as a career to a current medical student (100% vs 70%, $P = .001$).

Conclusion—This knowledge may help to tailor training experiences to promote academic careers. By supporting funding mechanisms and grant-writing programs, while encouraging mentorship and productive research experiences, current surgical trainees may be more enthusiastic about a career in academic practice.

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Introduction

The field of surgery has advanced and flourished because of the contributions from surgeons in all practice types—private, community, academic, and others. All of these types of surgeons support unique aspects of clinical and surgical care as well as diverse and varied patient populations. The field of general surgery and the training of future surgeons has undergone substantial change as the administration and delivery of health care remains in a dynamic state. Residency programs more interested in and charged with training the next generation of surgeon scientists have not been immune to these changes and face specific challenges in continuing to produce clinicians with career goals invested in the realms of both clinical practice and research. Surgeon scientists have contributed greatly to advances in surgery and medicine throughout history, a tradition that continues to improve patient care and discovery in the present,^{1,2} but there seem to be increasing impediments to the pursuit of research productivity and academic careers for surgeons.³ These barriers usher in the thought of possible drastic decreases in the prevalence of surgeon-scientists in the future.

A survey of practicing surgeons in 2015 found the most commonly cited barriers to academic investigation included pressure to be clinically active, excessive administrative responsibilities, and a desire for work/life balance. Sixty-eight percent of academic surgeons surveyed felt it was not feasible to be successful as both a surgeon and a basic scientist in the current environment.⁴ With the increasing reliance of hospitals on procedure-generated income,⁵ surgeons are impacted disproportionately by increasing clinical demands in comparison to non-surgical colleagues.⁶ It is not surprising then that non-surgical clinicians are more likely to apply for and receive National Institutes of Health (NIH) and other outside funding.⁷ Furthermore, seeking extramural funding has become even more competitive. There has been an appreciable decrease in NIH research funding⁸ and an estimated 19% decrease in NIH funding allotted to surgical research from 2003–2013.⁹

To counter these barriers, a renewed focus on cultivating surgeon scientists and growing their academic careers has moved to the forefront of many aspects of surgical education, surgical residencies, and postgraduate fellowships. The Blue Ribbon Committee Report on Surgical Education carried out by the American Surgical Association in 2004 called for protected time for research at the trainee and young faculty levels.¹⁰ With this renewed focus, the fundamental question remains of how to prepare residency candidates for successful academic careers.

The aim of this study was to determine the factors that play a role in the progression of surgery trainees into academic versus non-academic practice settings among graduates of the University of Virginia General Surgery Residency from 1964–2016. This knowledge may be used by the leaders in surgical education to tailor training experiences to promote the pursuit of a career in academic surgery.

Methods

Survey design

An electronic survey of 34 questions was developed using the online survey software provided by SurveyMonkey (SurveyMonkey Inc.; San Mateo, CA). The survey assessed aspects of surgery training and career decision-making as well as satisfaction with career choices. Demographic, surgery training, and detailed practice data were gathered. The 5-point Likert scale was used to investigate the influence of select factors on career choice, perception of academic surgery, and the research climate. Prior to distribution, a small pilot group of academic and non-academic surgeons unaffiliated with the University of Virginia completed the survey to assess for clarity, ease of completion, and the anticipated time required for completion. While clarifications were made based on this review, no changes to survey content were made prior to the distribution to target participants. The survey was then conducted between July and October 2017.

Study population

The study population was comprised of graduates from the academic general surgery training program at the University of Virginia from 1964–2016. Graduates were contacted via e-mail and alumni social media networks for voluntary participation in the study. The overall response rate was 51%. Responses from graduates who were still actively engaged in surgery training (ie, completing a fellowship) as well as those who indicated they are fully retired were excluded from analysis. Responses received were analyzed by practice type, *academic* (to include those who indicated an academic practice or mixed practice) and *non-academic* (to include those who indicated a private practice, community practice, or other, such as a Veterans Administration practice).

Statistical analysis

Normally distributed continuous data was analyzed using Student's *t* test, and Wilcoxon rank sum test was used for non-normally distributed continuous data. A Chi-square test was used for categorical data. Statistical significance was defined by a *P* value of <.05. Likert scale data were analyzed as mean values. Analytical tests were performed with SAS 9.4 software (SAS Institute Inc., Cary, NC). This study was approved by the Institutional Review Board for Social and Behavioral Sciences at the University of Virginia (#2017-0207).

Results

Respondents

Of the 135 surveys distributed electronically, 69 participants responded—a response rate of 51% (69/135). Six respondents were ineligible due to incomplete responses, and 9 were excluded based on previously mentioned study criteria, creating an effective response rate of 43% (54/126). Eligible respondents included 63% as having selected academic (affiliated with a university hospital or health system) or mixed (private/community practice with an academic affiliation) as their practice type and 37% who considered their practice type to be

private (solo or group-owned practice), community (affiliated with a non-university hospital or health system), or other (Veterans Administration, etc).

Overall characteristics

The general characteristics of study participants reflected age, sex, race/ethnicity, and practice type diversity that is consistent with the known program graduate population over time and are depicted in Table 1. Eighty-one percent of respondents had completed a fellowship, representing 11 different specialties, and 26% had obtained an additional academic/research degree, such as an MPH, PhD, or MS. The rate of completion of an advanced degree was not different between academic practice and non-academic practice (34% vs; 13%; $P = .18$). Thirty-seven percent of all respondents reported \$100,000 in student debt at the time of medical school graduation, including 44% of those in academic practice and 25% of those in non-academic practice ($P = .05$).

Academic and research experience

To assess depth of research background, respondents were asked about research experience prior to and during surgery residency (Table 2). The majority of respondents did not have full-time research experience prior to matriculation into our general surgery residency. This included 62% of academic surgeons and 80% of non-academic surgeons ($P = .38$). Eighty-six percent of those in academic practice participated in dedicated research time during training compared to 60% of those in non-academic practice ($P = .07$). Non-academic surgeons reported fewer publications at the completion of surgery training than academic surgeons, with only 60% of those in non-academic practice publishing >3 peer-reviewed journal articles as compared to 94% of those in academic practice ($P = .02$).

Career satisfaction and happiness

Questions pertaining to the happiness of respondents with both their occupation and personal life were included in the survey (Table 3). Academic and non-academic surgeons had similar marriage rates and numbers of children. Eighty-eight percent of those in academic practice reported feeling *professionally* satisfied with their job, and 82% reported being happy with their career choice. Non-academic surgeons expressed similar sentiments at 85% for both satisfaction and happiness with their jobs. Both academic and non-academic surgeons reported being satisfied with their personal lives (82% vs 90%). Despite similarly reported satisfaction between the 2 groups, academic surgeons were more likely to recommend surgery as a career than non-academic surgeons, 100% vs 70% ($P = .001$).

Career influences

A 5-point Likert scale measured responses on career satisfaction and influence of factors in their choice of a practice setting (Table 4). Factors cited as encouraging the pursuit of an academic career were similar for both types of surgeons, including involvement in education of trainees and access to professional mentorship. Both groups, however, reported that the need for grant-writing and funding requirements were deterrent to academia. The availability of funding was a discouraging factor for only those in non-academic settings (1.9 vs 3.3, $P < .001$).

Lifestyle factors were also considered using the Likert scale. The desired amount of family/leisure time did not impact the respondents' desire to pursue research in their careers but did discourage non-academic surgeons from pursuing an academic position. The perception of how happy surgeons in academia are tended to influence academic surgeons to pursue academia but not their counterparts in community practice (3.4 vs 2.4, $P < .001$).

Respondents were asked to rate on a scale from 1 (strongly discouraged) to 5 (strongly encouraged) how important the listed factors were when deciding whether or not to perform research during their career and in the decision to pursue (or not to pursue) an academic surgery position. Means of Likert scale responses are displayed in Table 4 with standard deviation (SD).

Discussion

Surgeons in academic practice in this study were more likely to be fellowship trained, but rates of advanced degrees were not different between those pursuing academic and non-academic practice. As residency programs prioritize funding and resource allocation, this may suggest the trend toward encouraging advanced degrees may not result in greater matriculation into academic positions.¹¹

Academic surgeons had more publications at the conclusion of training, suggesting mechanisms to assist surgery residents and fellows with research productivity while in training may be fruitful in advancing graduates into academic careers. Others have reported novel research arrangements to encourage trainee publication, such as transitioning dedicated research time to fellowship, dividing research time over the duration of residency, or implementing a research-targeted mentorship and education program for junior residents prior to entering dedicated research years.^{12,13} Additionally, greater levels of academic alumni may be encouraged by a rigorous mentoring program, which the alumni in this study reported as a key aspect of career decision-making. Our data suggest mentorship relationships would not only be beneficial for the trainee but may also improve career satisfaction for the faculty mentors, as has been shown in other fields.¹⁴ Successful archetypes exist for training adjuncts that may benefit from widespread application, such as structured research curriculums for resident trainees^{15,16} and peer coaching throughout surgical development, beginning as early as the intern year.¹⁷

Interestingly, we found that academic surgeons had more student debt than their non-academic practice counterparts at the conclusion of medical school, weakening claims that large amounts of student debt drive trainees toward private and community practice.¹⁸ In a separate aspect of financial matters, when asked about the influence of future income potential in the decision to pursue research or academic careers, both academic and non-academic respondents reported impact on income potential to be discouraging with regard to research and academic careers.

We were happy to learn that the surgeons surveyed report overall high levels of professional and personal happiness. They are satisfied with their chosen career and would generally recommend a surgical career to a medical student. This was particularly true for those in

academic medicine. Though there are similar rates of reported professional and personal happiness in this survey, the greater likelihood of academic surgeons to recommend surgery as a career may be related to known differences in burnout and factors that contribute to career satisfaction among academic versus non-academic surgeons as reported by Balch and colleagues that may not have been captured adequately within the scope of this study.¹⁹ Results of this nature are positive and report greater rates of happiness and satisfaction for the group surveyed than recent reported physician burnout studies.^{20,21,22} This finding lends support for actions that further decrease job-related stresses involving administrative burdens and lack of research funding to continue to promote a positive work environment that attracts the future generation of surgeons. This study also supports the notion that the stresses and demands of a surgical career, as well as the individuals who choose to pursue it, are very different from those in non-surgical aspects of medicine, suggesting that professional burnout and stress-reduction programs should be tailored to field/specialty.²³

Expansion of the study to multiple institutions would aid in the generalizability of these findings, because we recognize the limitations of our conclusions from a single institution study with a small sample size and, in turn, the possible introduction of error and bias. While the results may be reflective of the experience of a graduate from an academically driven program, they do not encompass that of a non-academic affiliated program. This potential area of divergence warrants further exploration as influential factors in decision-making may differ. Pursuit of a multi-institutional survey would also allow for the investigation of the diversity of institutional, geographic, and practice types in responses and could greatly aid in forming more concrete, actionable ideas to aid in the training of future academic surgeons. Increasing the sample size may also allow for analysis of trends over time, such as decade of graduation, etc, that were difficult to determine in this study. While convenient for completion, the multiple-choice structure of the survey hampered an in-qualitative analysis that could be more revealing in the assessment of influential factors in the decision-making process of surgeons to pursue research endeavors and academic careers. Results from a free text comment section at the end of the survey suggest that surgeons are invested in the training of potential colleagues and future work, such as focus groups, and additional surveys in this area would be welcomed.

The landscape of surgery training and career paths for surgeons is evolving rapidly. Deciphering how best to train a surgeon scientist to promote continued research contribution and success in a modern academic career are challenges that must be met to continue to engender advances in the care of surgical patients.

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Table 1

Demographic Characteristics of Survey Respondents.

	Practice Type			<i>p</i> value
	Overall	Academic	Non-Academic	
Gender	n = 54 (%)	n = 34 (%)	n = 20 (%)	0.11
Male	39 (72)	22 (65)	17 (85)	
Female	15 (28)	12 (35)	3 (15)	
Ethnicity				0.63
White	45 (83)	28 (82)	17 (85)	
Asian	5 (9)	4 (12)	1 (5)	
African American	4 (8)	2 (6)	2 (10)	
Hispanic/Latino	0	0	0	
American Indian	0	0	0	
Age	Years (SD)	Years (SD)	Years (SD)	
Mean age at medical school graduation	26.5 (2.31)	26.9 (2.57)	26.4 (2.01)	0.27
Mean age at completion of surgical training	34.5 (2.81)	35.1 (2.85)	34.5 (2.74)	0.26
Additional Training Information	n = 54 (%)	n = 34 (%)	n = 20 (%)	
Completed Fellowship				0.001
Yes	46 (85)	33 (97)	13 (65)	
No	8 (15)	1 (3)	7 (35)	
Additional Degree (PhD, MBA, MPH, etc)				0.18
Yes	15 (28)	12 (34)	3 (13)	
No	39 (72)	22 (66)	17 (87)	
Years in Practice				0.61
0–5 years	15 (27)	11 (32)	4 (20)	
6–10 years	10 (19)	7 (21)	3 (15)	
11–20 years	10 (19)	5 (15)	5 (25)	
>20 years	19 (35)	11 (32)	8 (40)	
Student Debt at Medical School Graduation				0.05
No debt	20 (37)	8 (23)	12 (60)	
\$1–\$49,999	8 (15)	7 (21)	1 (5)	
\$50,000–\$100,000	6 (11)	4 (12)	2 (10)	
>\$100,000	20 (37)	15 (44)	5 (25)	

Table 2

Academic and Research Experience of Survey Respondents.

	Practice Type		
	Academic	Non-Academic	<i>p</i> Value
Research			
Full Time Research Prior to Residency	n = 34 (%)	n = 20 (%)	0.38
0 years	21 (62)	16 (80)	
1 year	8 (23)	2 (10)	
2 years	3 (9)	2 (10)	
> 2 years	2 (6)	0	
Full Time Research During Residency	n = 34 (%)	n = 20 (%)	0.07
0 years	5 (15)	8 (40)	
1 year	8 (24)	6 (30)	
2 years	18 (53)	6 (30)	
> 2 years	3 (9)	0	
Current Hours per Week Spent on Research	n = 34 (%)	n = 20 (%)	0.03
0 hours/week	11 (32)	15 (75)	
1–5 hours/week	14 (41)	4 (20)	
6–10 hours/week	5 (15)	0	
11–20 hours/ week	2 (6)	0	
> 20 hours/week	2 (6)	1 (5)	
Publications			
Publications Prior to Residency	n = 34 (%)	n = 20 (%)	0.44
0–2 publications	29 (85)	17 (85)	
3–5 publications	3 (9)	3 (15)	
>5 publications	2 (6)	0	
Publications at End of Training	n = 34 (%)	n = 20 (%)	0.02
0–3 publications	2 (6)	8 (40)	
4–10 publications	13 (38)	7 (35)	
11–18 publications	11 (32)	4 (20)	
19–30 publications	4 (12)	0	
> 30 publications	4 (12)	1 (5)	
Publications Since Completion of Training	n = 34 (%)	n = 20 (%)	0.04
< 5 publications	12 (35)	15 (75)	
5–10 publications	6 (16)	2 (10)	
11–25 publications	4 (12)	2 (10)	
26–50 publications	4 (12)	0	
> 50 publications	8 (25)	1 (5)	

Table 3

Career Satisfaction and Happiness of Survey Respondents.

	Practice Type		
	Academic	Non-Academic	<i>p</i> Value
Personal Life			
Partner or Significant Other	n = 34 (%)	n = 20 (%)	0.78
Yes	20 (59)	11 (55)	
No	14 (41)	9 (45)	
Number of Children	n = 34 (%)	n = 20 (%)	0.55
No children	4 (12)	1 (5)	
1 child	7 (20)	3 (15)	
2 children	10 (30)	4 (20)	
3 children	7 (20)	8 (40)	
> 3 children	18 (6)	4 (20)	
Happiness/Satisfaction			
Professional Satisfaction with Career	n = 34 (%)	n = 20 (%)	0.97
Very Satisfied	22 (65)	12 (60)	
Satisfied	8 (23)	5 (25)	
Neutral	3 (9)	2 (10)	
Dissatisfied	1 (3)	1 (5)	
Very Dissatisfied	0	0	
Happiness with Career	n = 34 (%)	n = 20 (%)	0.53
Very Happy	16 (47)	10 (50)	
Happy	12 (35)	7 (35)	
Neutral	5 (15)	1 (5)	
Unhappy	1 (3)	2 (10)	
Very Unhappy	0	0	
Happiness with Personal Life	n = 34 (%)	n = 20 (%)	0.17
Very Happy	15 (44)	13 (65)	
Happy	13 (38)	5 (25)	
Neutral	6 (18)	1 (5)	
Unhappy	0	0	
Very Unhappy	0	1 (5)	
Recommend Surgery as a Career	n = 34 (%)	n = 20 (%)	0.001
Yes	34 (100)	14 (70)	
No	0	6 (30)	

Table 4

Influence of Qualitative Factors on the Pursuit of Research and Academic Surgical Careers.

	Practice Type		
	Academic n=34	Non-Academic n=20	p Value
Access to Professional Mentorship			
Research	4.3 (0.76)	3.2 (0.95)	<.0001
Academic Surgery	4.2 (0.88)	3.1 (0.21)	
Amount of Administrative Tasks			
Research	2.7 (0.89)	2.2 (0.67)	0.03
Academic Surgery	2.8 (0.79)	2.4 (0.67)	
Availability of Research Funding			
Research	2.9 (1.2)	2.1 (0.85)	0.006
Academic Surgery	3.3 (0.91)	1.9 (0.82)	
Amount of Dedicated Time for Research			
Research	2.9 (1.3)	2.1 (1.1)	0.03
Academic Surgery	3.4 (0.86)	2.2 (0.86)	
Involvement in Education of Trainees			
Research	4.0 (0.85)	3.3 (0.79)	0.003
Academic Surgery	4.3 (0.85)	3.3 (1.13)	
Need for Grant Writing /Funding Applications			
Research	2.6 (1.1)	1.7 (0.86)	0.004
Academic Surgery	2.6 (0.89)	1.7 (0.63)	
Desired Amount of Family/Leisure Time			
Research	2.7 (0.92)	2.4 (1.04)	0.28
Academic Surgery	2.9 (0.69)	2.1 (0.99)	
Perception of Others' Happiness			
Research	3.3 (0.73)	2.9 (0.82)	0.11
Academic Surgery	3.4 (0.94)	2.4 (1.04)	
Impact on Income Potential			
Research	2.7 (0.59)	2.2 (0.89)	0.05
Academic Surgery	2.6 (0.65)	2.4 (0.75)