Engagement, Workplace Satisfaction, and Retention of Surgical Specialists in Academic Medicine in the United States

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BACKGROUND: Academic medical centers strive for clinical excellence with operational efficiency and financial solvency, which requires institutions to retain productive and skillful surgical specialists. Faculty workplace perceptions, overall satisfaction, and intent to leave are relationships that have not been examined previously among US surgeons in academic medicine. We hypothesize that critical factors related to workplace satisfaction and engagement could be identified as important for enhancing institutional retention of academic surgeons.

STUDY DESIGN: The 2011–2012 Association of American Medical Colleges Faculty Forward Engagement Survey evaluated demographic variables, physician workplace satisfaction, and overall engagement among faculty subgroups, including comparison of surgical and nonsurgical clinicians. Multiple regression analysis (β = standard regression coefficient) was performed to identify critical factors most closely related to surgeon satisfaction and intent to leave their institutions.

RESULTS: A total of 1,356 of 1,949 (70%) surgeons from 14 medical schools responded across different faculty subgroups, and comparisons were made with 1,105 nonsurgical clinicians. Multiple regression indicated that the strongest predictors of surgeons' overall satisfaction with their department included department governance ($\beta = 0.36$; $p < 0.001$), collegiality and collaboration ($\beta = 0.23$; $p < 0.001$), and relationship with supervisor ($\beta = 0.17$; $p < 0.001$). Although compensation and benefits were important ($\beta = 0.08$; $p < 0.001$), these did not rank as the most important factors. Promotion equality (odds ratio = 0.62; $p < 0.05$), collegiality and collaboration (odds ratio = 0 .51; $p < 0.05$), and nature of their work (odds ratio = 0.52; $p < 0.05$) were most closely related to intent to leave the medical school within 1 to 2 years.

CONCLUSIONS: In the largest survey focusing on workplace factors affecting surgical faculty satisfaction and intent to leave, we conclude that institutional understanding of, and improvement in, specific work environment factors can enhance recruitment and retention of academic surgeons. (J Am Coll Surg 2014;219:31–44. © 2014 by the American College of Surgeons)

Clinical excellence, enhanced productivity, pioneering research, superior education and training, operational efficiency, and financial solvency represent the lead missions coveted by modern academic surgical centers. These missions are increasingly difficult to achieve simultaneously in the current economic climate, where the rate of health care change is unprecedented.[1-4] Together, these pressures have transformed surgical academic institutions into consumer products that are scrutinized for quality by regulatory and financial organizations; by discerning patients searching for excellent, reputable care; and by department managers wishing to grow and expand. In this context, departmental branding by institutional leaders has become even more important, as centers compete for market share in patients, research dollars, philanthropic commitments, health care revenue, trainees, and top faculty recruits.[1,5-7] The relationships between attracting surgical talent,

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retaining core surgeons, faculty perception of workplace desirability, and achievement of departmental and institutional missions, are intimately linked.[8-13]

Organizational mission success, dependent on the effectiveness of the whole workforce, is enhanced by raising the performance of individual faculty. The workforce is a valuable and strategic resource that drives organizational performance if the faculty is engaged and the mission and incentives are aligned.[1,8,13-15] Engaged faculty are emotionally committed to one or more areas in patient care, teaching, research, and administration, experience workplace satisfaction, and identify with the organization's values and goals.[13-15] Sustained faculty engagement and workplace satisfaction improve organizational performance, defined by quality of patient care, hospital mortality rates, customer service quality, productivity, and various measures of financial performance.[8,16-21] A lack of engagement can lead to faculty turnover to competitor centers, interruption of institutional missions, re-recruitment efforts, increased financial costs, and loss of revenue.[22,23] The effects of developing and retaining a valuable and talented workforce have been well studied in other sectors, but these processes have not been rigorously analyzed with respect to academic surgery. We hypothesize that factors critical to faculty engagement and workplace satisfaction can be identified and analyzed for their importance with respect to retention of academic surgical faculty.

METHODS

Data for this study were obtained from faculty at 14 Liaison Committee on Medical Education (LCME)–accredited US medical schools that self-selected to participate in the Association of American Medical Colleges' (AAMC) Faculty Forward Engagement Survey in 2011–2012. The AAMC offers the Faculty Forward Engagement Survey as a tool to assist schools in measuring the engagement and retention intentions of their faculty. It is an optional service by the AAMC that is open to all schools that wish to participate. During 2011, fourteen schools chose to have the AAMC administer this survey to their faculty. Study approval was obtained from the committee on the use of human subjects at the American Institutes of Research. Full-time and part-time faculty at participating institutions were invited to participate in a voluntary, web-based survey to assess faculty satisfaction, intent to leave, and the workplace factors that might be related to overall engagement and retention. Summary scores incorporate survey dimensions and these encompass multiple survey questions (Table 1 and Appendix [available at: http://www.journalacs.org]). For example, the summary scores for "focus on medical school mission" and "workplace culture" are derived from the dimension "focus on medical school mission," which encompasses questions Q12 to Q14 (Table 1 and Appendix [available at: http://www.journalacs.org]). The survey instrument was developed and tested in 2008–2009 by experts in survey research, organizational science, and academic medicine. The instrument was refined in 2010 based on psychometric analyses that supported expansion of survey content and the development of summary scores for each survey dimension (Table 1). These changes contribute to the content and construct validity of the final instrument to measure faculty perceptions of the workplace.

A total of 15,570 full-time and part-time faculty from 14 institutions were invited to participate. Nine thousand six hundred faculty responded to the survey, for a response rate of 61.7%. Participating institutions approximated the overall faculty representation of LCME-accredited schools in terms of distribution of faculty invited by department type (basic vs clinical). (Faculty count source: AAMC Medical School Profile System. Full-time faculty counts reflect information from the AAMC Faculty Roster as verified and updated by medical schools for purposes of LCME reporting available at: https://services.aamc.org/mspsreports/index.cfm.) Faculty from 13 institutions received an initial email invitation and several reminders to participate between October and December 2011. Faculty from the 14th institution received the same email invitations and reminders on a slightly later timeline, between January and February 2012, per institution request. The Faculty Forward Engagement Survey was sent to 1,949 full-time and part-time surgical faculty. This study defines surgeons as faculty who were identified as members of the following departments/subspecialties: general surgery, neurosurgery, ophthalmology, orthopaedic surgery, otolaryngology, or surgical subspecialties, such as plastic surgery, trauma surgery, transplantation surgery, vascular surgery, and urology. For this analysis, we focused on surgical faculty respondents who identified as having a full-time appointment at their medical school.

Nonresponse bias indicated that the distribution of respondents differed slightly from the expected distribution of respondents, with fewer part-time (chi-square = 155.26; $p < 0.05$) and slightly more basic science faculty (chi-square = 9.67; $p < 0.05$) responding than expected (AAMC 2012 Faculty Forward Engagement Survey, unpublished). Linear regressions were conducted to assess which survey dimensions were driving factors in predicting overall satisfaction with one's department and medical school. Intent to leave one's medical institution was modeled using multivariate logistic regression. As a result

Table 1. Association of American Medical Colleges Faculty Forward Engagement Survey Dimension Descriptions and Reliability Coefficients

Dimension name	Dimension description	Summary score/Cronbach's α
Nature of work	Number of hours worked; time spent on mission areas; control over schedule; autonomy	My job ($\alpha = .760$)
Focus on medical school mission	Value the medical school and department places on various mission areas; whether the workplace culture cultivates excellence, collegiality, and other ideals	Focus on medical school mission ($\alpha = .903$) Workplace culture ($\alpha = .826$)
Medical school governance	Opportunities for faculty participation in governance; communication from the dean's office; medical school's explanation of finances to faculty	Medical school governance ($\alpha = .933$)
Department governance	Opportunities for faculty participation in decision making; communication from the department chair; department's explanation of finances to faculty	Department governance ($\alpha = .936$)
Collegiality and collaboration	Opportunities to collaborate with other faculty; personal "fit" (ie, sense of belonging); interactions with colleagues; intellectual vitality within the department and medical school; appreciation by colleagues	Collegiality and collaboration ($\alpha = .910$)
Relationship with supervisor	Supervisor's support of individual goals; good communication; perceptions of equity	Relationship with supervisor ($\alpha = .939$)
Mentoring and feedback	Quality of mentoring and feedback on career performance	NA
Opportunities for career and professional growth	Opportunities for professional development; pace of advancement; application of promotion criteria; whether promotion criteria are clear and reasonable within various mission areas; equal opportunities regardless of sex, race, and sexual orientation	Growth opportunities ($\alpha = .910$) Promotion equality ($\alpha = .864$)
Compensation and benefits	Evaluation of overall compensation; health and retirement benefits	Compensation and benefits ($\alpha = .817$)
Faculty recruitment and retention	Success in hiring and retaining high quality faculty	Faculty recruitment and retention ($\alpha = .869$)
Clinical practice	Ability to provide high-quality care; how well the clinical practice functions overall	Clinical practice ($\alpha = .913$)
Global satisfaction	Overall satisfaction with department and medical school as places to work, including two open-ended questions to solicit suggestions for improvement	NA
Part-time faculty views	New experimental section based on focus group research to assess decisions for part-time status and support from institution	NA
Demographic information	Demographic information about sex, race, age, etc	NA
Appointment information	Time of appointment; type of appointment; administrative roles	NA

Summary scores were created representing conceptually related items with compatible scales within the survey dimensions.
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of the regression analyses, we present odds ratios to assess the impact of variables on the likelihood of retention risks. Using this technique, we estimate which factors could have the ability to increase or decrease one's odds of intent to leave. We used *t*-tests and chi-square analyses to investigate responses across the survey's various dimensions to identify if differences existed by sex and rank. Analyses were conducted using IBM SPSS Statistics software, version 19 and SAS software, version 9.3 (SAS Institute). We defined statistical significance as $p < 0.05$ for 2-sided tests with CIs at 95%.

RESULTS

The surgeon response rate (n = 1,356 [70%]) was slightly higher than the overall survey response rate; most had a full-time appointment at their medical school (n = 1,308). Part-time surgical faculty represented a smaller group and were excluded from this analysis (n = 48). Table 2 displays the group demographics: most respondents were male (79% [1,038 of 1308]), self-identified as of a majority race group (white or Asian, 93% [1,216 of 1,308]) and had a senior rank (59% [723 of 1,223]).

Surgeons' satisfaction with their medical school as a place to work was similar to that of all full-time faculty respondents (63% vs 65%, respectively). Analyses conducted indicate that surgeons' satisfaction with their medical school is significantly driven by perceptions of the workplace culture ($\beta = 0.20$; $p < 0.001$), focus on medical school mission ($\beta = 0.19$; $p < 0.001$), satisfaction with clinical practice environment ($\beta = 0.18$; $p < 0.001$), and medical school governance ($\beta = 0.18$; $p < 0.001$) (Table 3). Similarly, 74% of surgeons were satisfied with their department as a place to work, compared with 73% of all full-time faculty. Analyses show that department governance ($\beta = 0.36$; $p < 0.001$), collegiality and collaboration ($\beta = 0.23$; $p < 0.001$), relationship with supervisor ($\beta = 0.17$; $p < 0.001$), and faculty recruitment and retention ($\beta = 0.14$; $p < 0.001$) significantly impact surgeons' satisfaction with their department (Table 4). General surgeons reported lower satisfaction (66%) with their department than other subspecialty surgeons (Fig. 1).

We also compared surgeon satisfaction with primary care faculty (defined as family medicine, general internal medicine, or general pediatrics) (n = 1,105; 945 of whom were full time). Primary care faculty report significantly higher satisfaction with their medical school (70%; $p = 0.008$) and departments (77%; $p = 0.02$) as places to work compared with surgical faculty.

Surgeons reported working more hours per week (68 vs 60 hours), more time in direct patient care (51% vs 40%) and in research and scholarship (21% vs 18%), and less time on teaching and education (16% vs 22%). The groups spent similar time on administration and institutional service.

Most surgeons (82%) agreed that their day-to-day activities give them a sense of accomplishment and most (80%) agreed that additional professional advancement at their medical school is important to them. Overall, surgeons reported high satisfaction with their personal (79%) and professional interactions with colleagues (81%) and that the faculty in their departments usually get along well together (78%). However, surgical faculty reported low satisfaction with a number of questions about communication in their medical schools and their clinical practice locations. Less than half of faculty agreed that there is sufficient communication from the dean's office to the faculty about the medical school (42%), that senior leadership does a good job explaining medical school finances (27%), and that the dean's priorities for the medical school are clear (47%). Similarly, less than half were satisfied with their opportunities for input in management or administrative decisions at their practice location (43%), communication between physicians and senior administrators (42%), and communication to physicians about their practice locations' financial status (35%). The reported dissatisfaction with communication in medical school and clinical site locations is seen across all faculty as an opportunity for improvement (AAMC 2011-12 Faculty Forward Engagement Survey Cohort Report, unpublished).

In response to the query item about intent to leave their medical school in the next 1 to 2 years, most intend to stay (86% [833 of 970]), although a higher proportion (14% [137 of 970]) of surgeons reported intent, compared with 12.5% of all faculty surveyed. Respondents were less likely to report intent to leave if they were satisfied with the nature of their work ("my job"; odds ratio [OR] = 0.52; $p = 0.017$), their perceptions of collegiality and collaboration (OR = 0.51; $p = 0.034$), and their overall sense of equality in promotion opportunities (OR = 0.62; $p = 0.049$) (Table 5).

Table 2. Demographics of Full-Time Surgical Faculty Responders Compared with Full-Time Primary Care Clinical Faculty Responders from the Association of American Medical Colleges Faculty Forward Engagement Survey 2011–2012

	Surgical faculty (n = 1,308)		Primary care faculty (n = 945)	
Demographics	**n**	**%**	**n**	**%**
Age				
Younger than 28 y	3	0.2	0	0
28-45 y	533	41.0	349	37.0
46-65 y	534	41.0	402	43.0
>65 y	51	4.0	18	2.0
Other/no response	187	14.0	176	19.0
Sex				
Male	1,038	79.0	525	56.0
Female	270	21.0	420	44.0
Ethnicity				
Majority	1,216	93.0	846	90.0
Minority	92	7.0	99	10.0
Tenured/on tenure track	563	43.0	237	25.0
Not on tenure track	537	41.0	510	54.0
Other/no response	208	16.0	198	21.0
Rank				
Senior (full or associate professor)	723	55.0	502	53.0
Junior (assistant professor/instructor)	500	38.0	367	39.0
Other/no response	85	7.0	76	8.0
Administrative title	594	45.0	445	47.0
Nonadministrative title	678	52.0	468	50.0
Other	36	3.0	32	3.0

Table 3. Drivers of Overall Surgical Faculty Satisfaction with Medical School Using the Faculty Forward Engagement Survey Dimensions

	Standardized β	*t*	Significance	Correlation
Workplace culture	0.20	5.04	<0.001	0.65
Focus on medical school mission	0.19	4.89	<0.001	0.64
Clinical practice	0.18	5.42	<0.001	0.59
Medical school governance	0.18	5.25	<0.001	0.59
Collegiality and collaboration	0.12	3.35	0.001	0.55
My job	−0.12	−3.40	0.001	0.42
Compensation and benefits	0.09	3.03	0.003	0.46
Faculty recruitment and retention	0.08	2.41	0.016	0.53
Promotion equality	0.04	1.27	0.204	0.43
Growth opportunities	−0.01	−0.37	0.708	0.47
Relationship with supervisor	0.00	0.11	0.912	0.40

Model summary: $r = .76$, $r^2 = .58$, adjusted $r^2 = .57$, SE of estimate = 15.51.
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No significant differences were detected in overall satisfaction with department between men and women (75 % vs 68%). However, a number of significant differences were found when looking at item level results within each dimension (Table 6). Male faculty work significantly more hours than women (65 vs 57 hours; $p \leq 0.001$), report spending significantly less time doing research (21% vs 34%; $p \leq 0.001$), and spend more time in patient care activities compared with their female colleagues (54% vs 49%; $p = 0.025$). Significantly fewer women believed that their day-to-day activities gave them a sense of accomplishment (84% vs 76%; $p = 0.008$). Fewer women believed they were appreciated by their supervisors (70% vs 62%; $p = 0.028$) and colleagues (75% vs 61%; $p \leq 0.001$); fewer women were satisfied with the quality of their personal (80% vs 71%; $p = 0.005$) and professional interactions (83% vs 74%; $p = 0.009$) with their colleagues, and fewer agreed that their departmental colleagues were respectful of their efforts to balance work and home responsibilities (71% vs 62%; $p = 0.001$). Women also reported less agreement in being satisfied with how well they fit or their sense of belonging at their medical school (66% vs 57%; $p \leq 0.047$) and that the faculty in their department got along well together (80% vs 70%; $p = 0.004$). Although significantly more women agree that advancement at their medical school is important to them (80.5% vs 88.5%; $p = 0.013$), women are less satisfied with the pace of their advancement. Fewer women believed that their workplace cultivates diversity (77% vs 69%; $p \leq 0.001$) and that

Table 4. Drivers of Overall Surgical Faculty Satisfaction with Department Using the Faculty Forward Engagement Survey Dimensions

	Standardized β	*t*	Significance	Correlation
Department governance	0.36	12.16	<0.001	0.75
Collegiality and collaboration	0.23	7.86	<0.001	0.71
Relationship with supervisor	0.17	6.17	<0.001	0.69
Faculty recruitment and retention	0.14	5.20	<0.001	0.62
Medical school governance	−0.12	−4.61	<0.001	0.42
My job	0.08	3.27	0.001	0.55
Compensation and benefits	0.08	3.43	0.001	0.47
Focus on medical school mission	0.06	2.11	0.035	0.54
Promotion equality	−0.05	−1.96	0.050	0.46
Clinical practice	0.05	1.90	0.058	0.52
Workplace culture	0.05	1.55	0.121	0.58
Growth opportunities	−0.03	−1.28	0.199	0.13

Model summary: $r = .85$; $r^2 = .73$; adjusted $r^2 = .72$; SE of estimate = 14.19.
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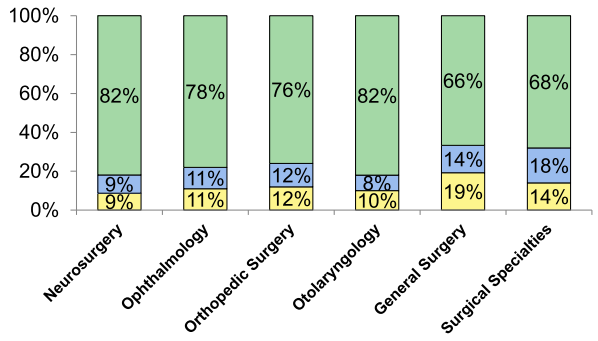

Figure 1. Full-time surgical faculty satisfaction with their department as a place to work. Green, very satisfied or satisfied; blue, neither satisfied or dissatisfied; yellow, very dissatisfied or dissatisfied. (Reprinted from: Association of American Medical Colleges Faculty Forward Engagement Survey, 2012. ©2011–2012 Association of American Medical Colleges, with permission. Figure cannot be used without permission from the Association of American Medical Colleges.)

their medical school offers equal opportunities to all faculty regardless of sex (88% vs 66%; $p \leq 0.001$), race (87% vs 72%; $p \leq 0.001$), or sexual orientation (86% vs 73%; $p \leq 0.001$). Fewer women reported satisfaction with their department's ability to retain female (73% vs 64%; $p \leq 0.001$) and minority (68% vs 59%; $p = 0.15$) faculty (Table 6).

We also detected significant differences between senior (full and associate professors) and junior faculty (Table 7). Compared with junior faculty, more senior faculty reported satisfaction with their medical school as a place to work (65% vs 59%; $p = 0.004$). However, more than half of senior surgeons (51%) disagreed that senior leadership does a good job of explaining medical school finances, compared with 39% of junior faculty ($p \leq 0.001$) (please note that items in Table 7 show the mirrored data with respect to the Likert scale; responders showing a positive association, agreement as opposed to disagreement, with the survey item). Slightly more than one fourth of senior faculty disagreed that the pace of decision making in the dean's office is reasonable (26% vs 17%; $p = 0.003$). Similarly, 26% of senior faculty disagreed that they could express their options without fear of retribution compared with 18% of junior faculty ($p = 0.006$). Additionally, less senior faculty compared with junior faculty agreed that their department chair's priorities are clear (61% vs 68%, respectively; $p \leq 0.005$) and reasonable (65% vs 71%, respectively; $p = 0.04$), that the department chair sets a good example reflecting the medical school's values (70% vs 76%, respectively; $p = 0.005$), and that their supervisor sets a good example in reflecting the medical school's values (63% vs 74%, respectively; $p \leq 0.001$). Significantly more junior than senior faculty believed that their supervisor actively encourages their career development (71% vs 60%, respectively; $p \leq 0.001$). Although significantly more junior faculty agreed that additional professional development at their medical school was important to them (90% vs 76%, respectively; $p \leq 0.001$). Fewer junior faculty were satisfied with the pace of their advancement compared with senior faculty (52% vs 64%, respectively; $p \leq 0.001$). Fewer junior faculty also thought it was clear what they needed to do to be promoted compared with senior faculty in terms of teaching/education (53% vs 65%, respectively; $p \leq 0.001$) and research/scholarship responsibilities (57% vs 69%, respectively; $p \leq 0.001$).

Table 5. Multivariate Odds Ratios for Predicting Surgical Faculty Intent to Leave Medical School

Dimension	Odds ratio	95% CI	p Value
My job*	0.52	0.31–0.89	0.017
Focus on medical school mission	0.65	0.37–1.13	0.128
Workplace culture	0.76	0.41–1.39	0.369
Department governance	0.69	0.43–1.10	0.116
Medical school governance	0.69	0.38–1.27	0.232
Relationship with Supervisor	0.94	0.64–1.38	0.761
Growth opportunities	1.42	0.74–2.71	0.228
Promotion equality*	0.62	0.38–1.00	0.049
Collegiality and collaboration*	0.51	0.28–0.95	0.034
Compensation and benefits	0.99	0.60–1.62	0.956
Clinical practice	0.72	0.45–1.15	0.170

*Significant results.

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DISCUSSION

Successful academic surgical leadership requires careful resource management to attain the core institutional goals in patient care, education, research, and administration. In this highly competitive climate and challenged economic environment, these missions need to be achieved with efficiency and financial accountability. Understanding the institution's surgical workforce and optimizing ways to enhance performance are keys to successful resource management. In this context, the surgical faculty represent a significant resource whose talent requires strategic management.[8] An integral component to successfully cultivating and sustaining a surgical workforce involves understanding the factors that lead to surgeon satisfaction and discontent, which has gained increasing interest in the recent literature.[9-13,24]

Table 6. Comparison of Men vs Women Surgical Faculty, Survey Items with Significantly Different Responses by Sex

	Male (n = 1,038)	Female (n = 270)	Significance p value
Hours worked	65 ± 15*	57 ± 14*	<0.001
Time devoted to:			
Teaching/education	17 ± 13*	16 ± 11*	0.23
Research/scholarship	21 ± 26*	34 ± 32*	<0.001
Patient care/client services	54 ± 25*	49 ± 29*	0.025
Administration/institutional service	14 ± 15*	13 ± 13*	0.49
My day-to-day activities give me a sense of accomplishment	84%	76%	0.008
I feel that the workplace culture at this medical school cultivates diversity	77%	68%	<0.001
There are sufficient opportunities for faculty participation in the governance of this department	59%	49%	0.009
I feel appreciated by my supervisor	70%	62%	0.28
Further advancement at this medical school is important to me	81%	89%	0.13
I am satisfied with the pace of my professional advancement at this medical school	61%	52%	0.044
My medical school offers equal opportunities to all faculty members			
Regardless of sex	88%	66%	<0.001
Regardless of race/ethnicity	87%	72%	<0.001
Regardless of sexual orientation	86%	73%	<0.001
I am satisfied with the quality of the personal interaction I have with departmental colleagues	80%	71%	0.005
I am satisfied with the quality of the professional interaction I have with departmental colleagues	83%	74%	0.009
I am satisfied with my sense of belonging in my medical school	66%	57%	0.47
My colleagues are respectful of my efforts to balance work and home responsibilities	71%	62%	0.001
The faculty in my department usually get along well together	80%	70%	0.004
I feel appreciated by my departmental colleagues	75%	61%	<0.001
My department is successful in retaining			
Female faculty members	73%	64%	<0.001
Racial/ethnic faculty members	68%	59%	0.015

*Values are mean ± SD.
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This study represents the largest comprehensive analysis of academic surgeons in the United States examining surgeon perceptions and factors related to engagement, workplace satisfaction, and intention to leave. The respondents in this survey are representative of the current demographic of surgeons in academic medicine in the United States. In our study, 79% of surgeons were male, 93% self-identified as part of a majority race group, and 59% had senior rank. Recently, several reputable studies noted that 11% to 20% of surgical respondents in national surveys were women.[10,11,24] Based on official American College of Surgeons' data about the demographics of US members, 8% of the membership are women,[24] with a recent national census showing that 21.3% of the surgical workforce in the United States is composed of women.[25] Sixty-three percent of all American College of Surgeons members are 50 years or older,[24] with census data indicating that 45% of the active surgical workforce are 55 years or older.[25] In one of the most extensive studies analyzing minorities in surgery, African Americans and Latino Americans were shown to constitute 5.4% and 4.8% of all US surgeons, but only 2.9% and 3.6% of academic surgeons, respectively.[26] In our analysis, the surveyed dimensions, including workplace culture, focus on medical school mission, clinical practice, and medical school governance, were highly associated with predicting satisfaction with the medical school. With regard to satisfaction with department, collegiality and collaboration, department and medical school governance, relationship with supervisor, faculty recruitment and retention practices, and factors related to the nature of work, were most predictive. Finally, the survey dimensions that have the highest association with intent to leave include nature of work/my job, collegiality and collaboration, and promotion equality. Several of these dimensions consistently predict overall satisfaction and intention to leave across models. Medical school and department governance are critical determinants of faculty satisfaction

Table 7. Comparison of Junior vs Senior Surgical Faculty, Survey Items with Significantly Different Responses by Rank

	Junior (n = 500)	Senior (n = 723)	p Value
Hours worked	63 ± 14*	65 ± 16*	0.036
Percent of time spent on patient care services	58 ± 24*	50 ± 25*	<0.001
Percent of time spent on patient care services	10 ± 10*	17 ± 17*	<0.001
The department chair's priorities for the department are clear	68%	61%	0.005
The chair's priorities for the department are reasonable	71%	65%	0.04
There are sufficient opportunities for faculty participation in the governance of this department	58%	56%	<0.001
The department chair sets a good example to reflect our medical's school values	76%	70%	0.005
There is sufficient communication from the dean's office to the faculty about the medical school	39%	42%	0.001
Senior leadership does a good job explaining medical school finances to the faculty	27%	25%	<0.001
The pace of decision making in the dean's office is reasonable	40%	38%	0.003
Faculty can express their opinions about the medical school without fear of retribution	50%	45%	0.006
My supervisor sets a good example to reflect this medical school's values	74%	63%	<0.001
My supervisor actively encourages my career development	71%	60%	<0.001
My supervisor listens to what I have to say	74%	68%	0.060
Further professional advancement at this medical school is important to me	90%	76%	<0.001
I am satisfied with the pace of my professional advancement at this medical school	52%	64%	<0.001
To be promoted, what I must do is clear to me in			
Teaching/education	53%	65%	<0.001
Research/scholarship	57%	69%	<0.001
Administration/Institutional service	46%	54%	0.022
My departmental colleagues are respectful of my efforts to balance work and home responsibilities	73%	65%	<0.001
My medical school is successful in retaining high quality faculty members	44%	36%	0.007
All things considered, how satisfied are you with your department as a place to work	72%	74%	0.004
All things considered, how satisfied are you with your medical school as a place to work	59%	65%	0.004

*Values are mean ± SD.

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within academic surgical centers and these findings confirm previous research conducted across general academic faculty disciplines in health care.[1,20,27] Governance characterized by organization, consistency in decision making, transparency with timely open communication, opportunities for faculty input and participation in the allocation of resources, contributes to faculty perceptions of their institutional worth and overall equity.[1,28,29] Leadership that successfully addresses these aspects of governance is less likely to propagate discontent.[20,28]

Focus of mission within the medical school and department also significantly predicts surgical faculty satisfaction. The individual survey items that comprised this dimension include a clear understanding of the mission, accomplishment of the medical school's aims, relationship between daily activities and the mission, and dedication toward excellent scholarship and teaching, and suggest the important role that education retains among the various types of work that surgeons perform. Certainly, there is often a disconnect between the perceived mission and execution of this commitment to education during the student clerkship.[30] The medical student's perception that they are an inconvenience when on service was confirmed by almost a third of surgical faculty in a single institution survey.[31] Many students also depended on surgical residents as their primary source of education.[31] The pace and demands of surgical patient care, the lack of intraoperative student participation, the absence of incentives for time spent by faculty on medical student surgical education contributes to the devaluation of the medical school mission and contradict the importance of the perceived academic role of the surgical faculty.[1]

Surgeon recruitment, retention, and promotion practices were consistent predictors of faculty satisfaction across models in this analysis. Faculty perception of the presence of successful strategies and a favorable work environment for retaining top surgical talent can raise institutional pride, enhance collegiality, reduce work-related stress, reduce attrition, and decrease direct

institutional costs.[1,22,23,29,32] Turnover remains a real threat, as surgical specialists continue to be in short supply, operating margins continue to be narrow, competitor organizations maintain aggressive recruitment strategies, and the resources allocated for retaining those highly selected surgeons are meager and insufficient, resulting in a potential revolving door.[29,33] In a recent study at a single academic surgical center, the mean surgeon attrition rate was calculated to be 26% during a 15-year period.[29] Subgroup analysis of the most recent cohort of faculty revealed that minority associate- and full-professor faculty contributed to an increasing attrition rate.[29] In our study, 11% of responders recorded a serious intent to leave the institution within the next 1 to 2 years, and 19% of faculty were uncertain of their intent to stay. Satiani and colleagues found a higher attrition rate among women surgeons during the most recent study period compared with historical groups,[29] and our results also suggested that a relatively higher percentage of women stated an intent to leave. Various studies have demonstrated that attrition is more frequent in first-time assistant professors during the first 3 to 5 years of appointment,[22,29] but, as shown by Satiani and colleagues, senior faculty are also at risk for attrition. The factors that contribute to retention are often organization specific and can be determined by the maturity of the practice, changes in surgical leadership, geography, institution factors, and burnout. There are direct costs to the institution when faculty leave, with mean hiring periods lasting 5 to 8 months.[22,23] Cumulative expenses derived from loss of clinical income, recruitment costs, and new hiring costs were recently analyzed by Schloss and colleagues and more than half a million dollars is associated with replacing a surgeon, which is more than 5 times that needed to replace a general internist.[22] The reasons for attrition of women and minority faculty were analyzed in a different study, which showed that career/professional advancement and departmental leadership issues ranked among the top reasons for leaving the institution.[34]

The current analysis shows that the survey items incorporated into the "nature of work" and the summary scores analyzed under "my job," were the strongest predictors of intention to leave the medical school. Surgeon autonomy, day-to-day satisfaction, role and function, and extent of discretionary effort are aspects associated with burnout (Appendix; available at: http://www.journalacs.org). Surgeon burnout has been shown to contribute significantly to job satisfaction and affects intent to leave, with rates of burnout documented to be as high as 40% in a recent analysis.[24,35] Factors independently associated with burnout include younger age, having children, hours worked/week, number of nights on call/week, area of specialization (ie, trauma, urology, otolaryngology, vascular surgery, or general surgery), and having compensation determined entirely on billing.[24] Having >50% professional effort dedicated to non−patient care tasks (eg, administration, education, and research) was associated with a lower risk of burnout.[24] In a follow-up study, the highest ranking variable rated by surgeons that promoted personal wellness and protected against burnout was finding personal meaning in their work.[35] In this context, the role of the surgical leadership and medical school administration in defining, maintaining, and achieving aligned professional and institutional goals can have a direct effect in improving surgeon workplace satisfaction and retention.

Some limitations to our study exist. First, 14 schools in the study self-selected to participate. Potentially, this self-selection can include programs that have a higher baseline of engagement by virtue of their participation. Although representative parity to all LCME-accredited schools was reasonably achieved with respect to geographical variation, size of the faculty, private vs public ownership, and distribution of faculty by type, undetected differences between institutions might exist. Variability in institutional leadership, faculty salaries, and focus of institutional missions can limit the generalizability of our findings.[1] Second, the selected global satisfaction measures used to define and assess overall faculty satisfaction have not been shown to predict individual or institutional success, although such a link is assumed to exist.[1] Additional analysis and study are required to validate these global satisfaction measures and establish these empiric relationships.[1] Finally, the variability in neutral or nonresponses ("I don't know" or "NA") affects sample size and can limit accurate assessment of surgeon groups.

We would also highlight that the purpose of this study was not to analyze sex-based differences in engagement and workplace satisfaction, as such an analysis would merit its own thorough discourse. However, interesting survey responses that indicate a difference in perception by male vs female faculty have been reported in our results. It is difficult to acquire published data that document patterns of sex discrimination with regard to promotion, recruitment, retention, or other aspects, such as governance or academic opportunities in surgery, which can of course interest the readership. However, these instances are likely under-reported for a variety of reasons, including the potential of litigation and the ability to prove cause. Sufficient data of this type for rigorous analysis likely do not exist. Certainly, it is neither the purpose nor intent of this study. Rather, we believe our findings that demonstrate that significant sex-based differences exist in the faculty's perception of the surgical

workplace culture are, by themselves, worthy of consideration by department leaders. These perceptions correlate with other published data to potentially help explain why there is a higher attrition rate among women,[29] a higher burnout rate among women,[10,35] why women are more likely to leave the surgery workforce to pursue certification in other nonsurgical specialties,[36] and why women are grossly under-represented at the level of chairpersons in general surgery[37] and in surgical subspecialties.[38] A clearer delineation of such relationships would require additional analysis and study.

These findings permit the development of strategic, actionable plans by surgical leaders, deans, and department managers that address the work environment with a specific focus on enhancing these key survey dimensions. The ultimate goal is achieving departmental and institutional aims. Specific strategies to improve transparency in governance, faculty participation, sex- and minority-based mentorship, avoidance of burnout, and retention of valued and experienced faculty is beyond the scope and purpose of this article. A review of current literature suggests strategic, coordinated approaches can optimize faculty engagement and satisfaction and they can include rigorous selection at the recruitment step to determine best of fit based on work culture, adequate "on boarding activities" to assist in the orientation of new faculty, targeted mentoring particularly for at-risk groups, with the availability of anonymous personal counseling to prevent burnout.[29,30,39-41] Communication between the leadership and the faculty to support adequate transparency in governance[42] as well as expectations of productivity[43] is important. The establishment of realistic aims and timely feedback can be achieved through formal clinical performance feedback programs, with performance-based compensation tailored for physician-scientist vs clinician-educator tract faculty and optimized incentive plans that are even potentially geared to specifically compensate nonclinical activities.[44-49]

Certainly, the concept of improving the work environment to suit the workforce runs counter to the traditional ethos of surgical training in which residents were acknowledged for adapting themselves to a stressful, unyielding work environment, for perseverance, and for resilience.[2,50,51] As trainees ascend to become faculty in academic centers, they can continue to experience a culture that is nonrelational, hierarchical, unwelcoming of differences, and nontransparent.[52] The perceived preferred route to professional advancement is through competition and self-promotion rather than collaboration, resulting in faculty feeling alienated or undervalued.[52] Current best practices applied from business models suggest that traditional "command-and-control" leadership is outdated and these negative approaches to faculty management adversely impact workforce performance.[2,51,53,54] Strong leadership with acquired expertise in modern managerial skills and applied business management is required to steer a diverse surgical department.[51,53,54] In a field that contributes >40% to a hospital's overall revenue, is externally evaluated and benchmarked, reliance on intuitive management is no longer sufficient.[2] Autonomous leadership might be lost to nonclinicians or yielded to other surgical chairs and managers who possess these required skills.[2,54] Ultimately, if the current workplace has an unappealing environment, the dissatisfied faculty can seek the desired departmental and medical school characteristics at a potential competitor institution.

CONCLUSIONS

Surgical faculty engagement remains a challenging aspect to manage in current academic medicine. Although many factors can be determined by characteristics intrinsic to the individual surgeon, a component of surgeon engagement and workplace satisfaction is ultimately determined by the factors described in this analysis, which are necessarily shaped by administration, chairs, and deans. Surgical leadership that seeks to understand and sustain a workforce can enhance workplace satisfaction, maintain faculty engagement, and improve surgeon retention.

Author Contributions

Study conception and design: Wai, Dandar, Radosevich, Brubaker, Kuo

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Analysis and interpretation of data: Wai, Dandar, Radosevich, Brubaker, Kuo

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Discussion

INVITED DISCUSSANT: DR JONATHAN D'CUNHA (Pittsburgh, PA): It has been stated that academic surgery is not possible in its true sense anymore. Competition among centers both locally and nationally for clinical excellence combined with the financial pressures in a rapidly changing health care marketplace has put extreme pressures on academic faculty for clinical productivity at many major academic institutions. These pressures, along with the need to teach, and pressures in the research arena for publishing and funding, have pushed academic surgery into a new era. All of these pressures translate downstream to faculty, trainees, and medical student perceptions of our specialty and subspecialties. Your work is timely and important because we need more detailed information about faculty turnover as this is the only way a department or institution can make proactive change to keep itself on track. The academic surgical departmental cycle of losing talented individuals through turnover kills the departmental and institutional mission.

As described in their presentation, the authors attempted to identify the critical factors related to workplace satisfaction and engagement that may be linked to institutional retention of academic surgeons. The authors used a survey instrument that has been refined by psychometric analysis and has content and construct validity—both important cornerstones to drawing conclusions from a survey. The study defines surgeons from a number of departments and subspecialties, with a 61% overall response rate and a 70% surgical response rate. This is the largest study of its kind to date and the authors found that promotion equality, collegiality, and perception of individual job factors were most closely related to intent to leave the medical school in 1 to 2 years. The strongest predictors of overall satisfaction included departmental governance, collegiality, and relationship with supervisor. They further compared their results within the surgical specialties to primary care, internal medicine, and pediatrics. Notably, general surgeons reported lower satisfaction rates when compared with others in this study. The results, however, cannot be considered to represent the opinions of all minorities and/or women in view of the small percentages of these within the respondents (7% and 21% respectively).

My questions are:

1. How were the 14 schools selected? Did they all have stable leadership structure at the time of the survey? I think this might be important to understand as we think about limitations of the work and bias.
2. How did you arrive at subspecialty selection within general surgery, and were there any differences in comparing the subspecialties that were relevant? For example, were any significant differences seen between neurosurgery and trauma surgery? This might support the importance of departmental organization and flow of information from the medical school to the departments.
3. Did you look at the data instead of by academic rank, but by years of experience? This would potentially allow one to subanalyze the data in an even more refined way because a junior faculty member who is 1 year out from training is certainly different from one who is 3 years out from training.
4. What are the next steps for your work? Will you dive deeper and survey faculty members who have left their institution? Will you further dissect the methods for communication within medical schools and academic departments to advise chairmen on processes to be put in place to retain surgical faculty?

DR PHILIP WAI: The first question related to how these 14 medical schools were selected. I think originally, the Association of American Medical Colleges (AAMC) sent out requests and invitations. And, ultimately, the medical schools responded by self-selection. Although there was geographic distribution that was even across the United States, certainly there is a difference among those 14 medical schools that may not be reflected in the information that we recovered, including some of the ones that you had mentioned, whether the leadership was new or old. We also did