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Women surgeons and the emergence of acute care surgery programs

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ABSTRACT

Background: In parallel to women entering general surgery training, acute care surgery (ACS) has been developing as a team-based approach to emergency general surgery (EGS). We sought to examine predictors of women surgeons in EGS generally, and ACS particularly.
Methods: From our national survey, we determined the proportion of women surgeons within EGS hospitals. We compared the proportion of women surgeons based on hospitals characteristics using chi-squared tests, then used regression models to measure odds of ACS relative to the proportion of women.
Results: 779 (50.4%) hospitals had zero women surgeons. These hospitals were more likely non-ACS and non-teaching with <200 beds. ACS had a higher median proportion of women surgeons (17%) compared to non-ACS (0%).
Conclusion: Our study highlights the dearth of women representation within EGS hospitals nationally and illuminates some of the underlying characteristics of ACS that may draw women: urban, academic, and staffed by more recently trained surgeons.
Summary: Using a national survey of Emergency General Surgery (EGS) hospitals, we sought to examine predictors of women surgeons in EGS generally, and acute care surgery (ACS) particularly. We found that 779 (50.4%) hospitals had zero women surgeons. Women were more likely to be among EGS surgeons at hospitals with ACS models. Our study highlights the dearth of women representation within EGS hospitals nationally and illuminates some of the underlying characteristics of ACS that may draw women: urban, academic, and staffed by a higher proportion of newly trained surgeons.
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Introduction

The past 3 decades have seen a rapid growth of women entering medical school and general surgery training, resulting in more women in surgical practice. In 2005 women entering medical school reached parity with men.[1] Despite this, only one-third of general surgery residents were women in 2008, with parity not expected until 2028.[1] During this same time, there have been growing concerns about a shortage of general surgeons[2–5] and inadequate access to care for emergency general surgery (EGS).[6–9] These concerns have been exacerbated by the growing trend towards specialization with 74% of general surgery residents from 2009 to 2013 pursuing specialty surgical practice.[10] For some, however, that specialty has been the relatively newer field of acute care surgery (ACS).

ACS was initially proposed in 2005 as an innovative model of care to facilitate timely and high-quality EGS care along with trauma and surgical critical care.[11–15] While clinical scope varies among present-day ACS models,[16–18] most share a dedicated team-based approach to providing EGS coverage rather than conventional general surgeon on call models. The widespread professional satisfaction of surgeons in these team-based practices is unknown. However, Coleman et al. found that the broad scope of practice, challenges of critical care, exciting clinical cases, the potential for

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shift work and controlled lifestyle were cited as attractive attributes by surgical residents considering ACS fellowship training.[19]

Among other specialties, such as hospital medicine, when team-based practice models with rotations among clinicians are implemented to provide round-the-clock care, the majority of physicians within the specialty were men but the proportion of women has been increasing.[20] We had previously reported that the mean proportion of women surgeons in ACS models (19.5 ± 17.4%) exceeds that of women in general surgeon on call models (13.7 ± 19.6%).[18] In the present manuscript, we examine the prevalence of women as EGS providers generally and more specifically within hospitals utilizing ACS models, investigating professional characteristics and hospital characteristics to explore why ACS might be a more appealing specialty to the women surgeons of today.

Methods

Data Source. The methodology of our national EGS survey has been previously described.[21–23] Briefly, a 68-item survey was developed to assess hospital-level factors that impact the delivery of EGS care. This questionnaire can be seen in Appendix 1. To identify hospitals to survey, the American Hospital Association (AHA) Annual Survey of Hospitals database was queried to identify acute care general hospitals. These results were further narrowed to only hospitals capable of providing EGS care based on the following inclusion criteria: providing care to adult patients (≥18 years old), presence of a 24-hour emergency department (ED), and facilities including at least one operating room (OR).[24] Next, we undertook a grassroots methodology through internet searches and contacting hospitals directly in order to confirm which hospitals had general surgery coverage. A hybrid mail/electronic survey was sent in two rounds to potential respondents at 2,811 acute care hospitals that met the above criteria. Round 1 targeted the most senior surgeon present who would have knowledge of both emergency surgery coverage and workforce composition at the hospital in question. Round 2, directed at the 60% of hospitals lacking a response at the conclusion of Round 1, targeted surgical peers with similar knowledge or the chief medical officers at hospitals with a single surgeon who did not respond to the initial survey. Each round was conducted over 6 weeks in 2015 using the same questionnaire.[22,23]

To explore the emerging role and scope of ACS practice models within EGS delivery,[16] the survey included a question regarding the hospital's overall approach to EGS care: "My hospital's overall approach to emergency general surgery is…" For which respondents could choose between, "A dedicated clinical team whose scope encompasses emergency general surgery (+/-trauma, +/− elective general surgery, +/− burns)," "A traditional approach with an ad hoc "general surgeon on call" schedule," or, "Other (please specify)." Hospitals that responded that they had a dedicated clinical team for EGS were classified as ACS hospitals, regardless of whether this included trauma surgery, elective general surgery, or burns. Hospitals that responded that their hospital's approach to emergency surgery was not a dedicated clinical team, whether they responded: "general surgeon on call" or "other," were classified as non-ACS.

The survey also included a number of questions specific to a hospital's various structures and processes surrounding EGS care. The total number of EGS surgeons was solicited as were the number within the following categories: women surgeons, surgeons over age 65, and newly trained surgeons (<3 years in practice). Respondents were also asked about multiple other professional characteristics of surgeons providing EGS care and how many surgeons possessed each characteristic (e.g., surgeon training and certifications, practice employment model, and other professional duties).

Statistical Analysis. The proportion of women surgeons providing EGS care was determined using the total number of surgeons providing EGS care as the denominator. After reviewing the distribution and summary statistics, the proportions of women EGS surgeons were separated into 5 groups for analysis (0%, 1–15%, 16–25%, 26–40%, >40%). These categories were based on the distribution of the variable; 0% was the median, 15% was the mean, and there were natural breaking points in the data at 25% and 40%. Differences in proportion of women EGS surgeons based on specific practice characteristics (employment model, non-clinical roles, additional degrees, subspecialty training) and hospital characteristics (ownership, location, inpatient bed capacity, teaching status, medical school affiliation, and trauma center designation) were compared using χ^2 tests of association and non-parametric tests of association for non-normally distributed continuous variables.

Unadjusted and adjusted binary logistic regression models were then constructed to measure odds of ACS model for EGS delivery relative to the proportion of women. Adjusted models included hospital ownership, location, inpatient bed capacity, teaching status, medical school affiliation, and trauma center designation as reported to the AHA Annual Survey.[24] To determine analytic appropriateness of models, sample size and standard model fit statistics were used. Tolerance statistics were used to assess collinearity. Hospitals that did not respond to the question regarding the total number of surgeons or the total number of women surgeons were excluded from analyses.

In addition, the geographic distribution of the proportion of women surgeons in the US by hospital zip code was mapped using Maptitude Software (Caliper Corp, Newton MA).

This study was approved by the University of Massachusetts Medical School Institutional Review Board and deemed exempt by the Ohio State University Institutional Review Board.

Results

In total, 1,690 (60.1%) hospitals responded to the survey, of which 1,546 met inclusion criteria. Across all represented hospitals, 779 (50.4%) had zero women surgeons providing EGS coverage; zero was both the median and the mode. Less than 10% of hospitals had >40% women surgeons providing EGS care. The geographic distribution of hospitals with varying proportions of women surgeons can be seen on the map in Fig. 1. Fig. 2a shows the overall proportion of women surgeons providing EGS care.

Table 1 shows the proportion of women surgeons providing EGS care by hospital characteristics as reported to the AHA. Hospitals with zero women surgeons were associated with non-ACS models, rural location, lack of trauma center certification, fewer than 200 beds, governmental or investor-owned status, and non-teaching status. Despite this association, 26.2% of hospitals with zero women surgeons have a medical school affiliation and 38.1% have major or minor teaching status. Table 2 shows the association between the proportion of women surgeons and the proportion of other surgeons providing EGS care based on various professional characteristics.

Overall, higher proportions of women surgeons were associated with hospitals in which a greater proportion of EGS surgeons were engaged in research or community outreach, part of an academic practice, board certified in critical care, or trained in either trauma or surgical critical care. Hospitals with zero women surgeons were unlikely to have surgeons with an academic employment model or who engage in research. Instead, their surgeons were most likely to be involved with administration and have a Master of Healthcare Administration (MHA). Hospitals with 0% women WGS surgeons

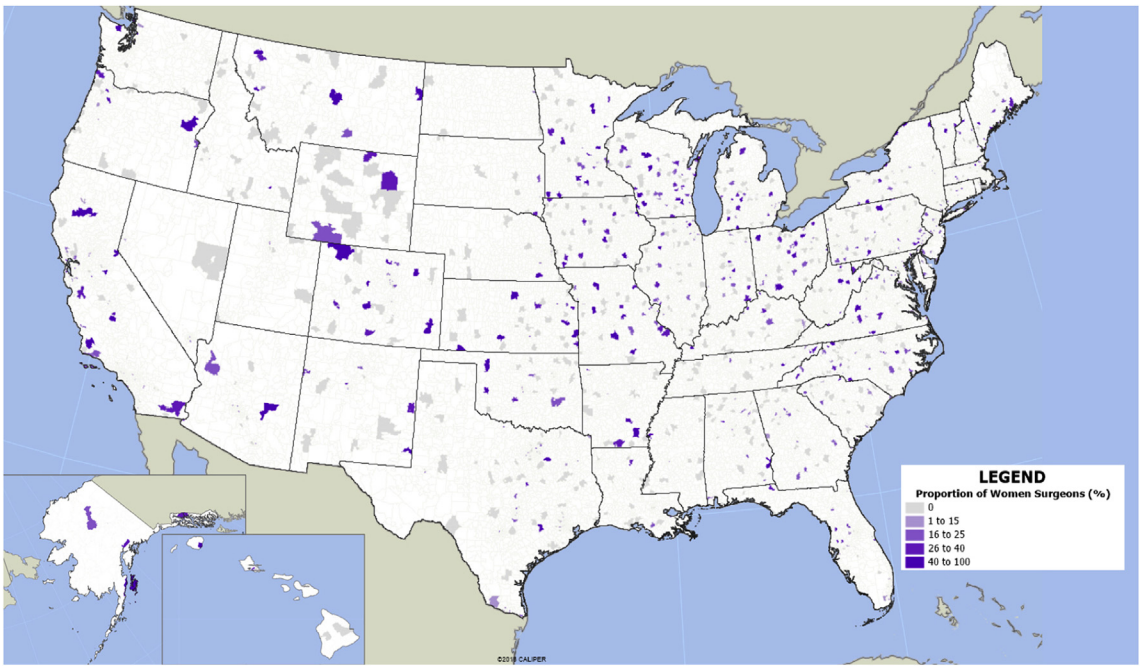
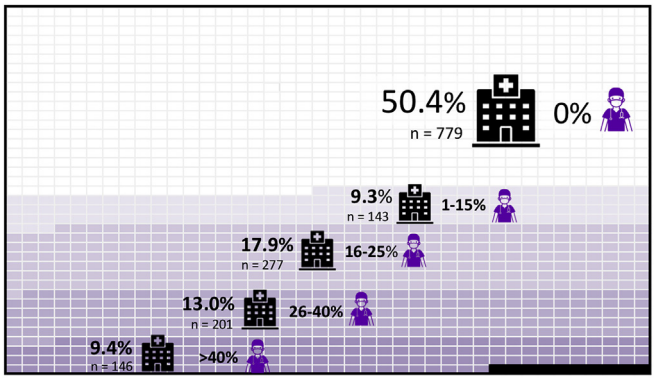


Fig. 1. Geographic Distribution of Proportion of Women Surgeons Providing Emergency General Surgery Care at 1,546 Hospitals in the US in 2015. Map of the United States with zip code level geographic distribution of hospitals with varying proportions of women surgeons providing emergency general surgery care. Maptitude Software was used to create visualization.



A

Fig. 2a. The Proportion of Women Surgeons Providing Emergency General Surgery Care at 1,546 Hospitals in the US in 2015. Each rectangle in this figure represents one hospital providing emergency general surgery (EGS) care, 1546 in total. The hospitals have then been divided based on proportion of women surgeons: 0%, 1–15%, 16–25%, 26–40%, and >40%. Within each category in the figure, the number and percentage of hospitals is highlighted. Of note, 779 hospitals (50.4%) have zero women surgeons providing EGS care.

were also unlikely to have surgeons who recently finished training. In contrast, hospitals with >40% women surgeons were more likely to have recently trained surgeons and surgeons engaged in research and community outreach. Surgeons at these hospitals were also more likely to have a Master of Business Administration (MBA), critical care certification, or additional training in critical care or trauma surgery. Hospitals with either 0% or >40% women surgeons both had a median of 3 surgeons providing EGS coverage.

Among the 1546 eligible hospitals, 1405 reported their type of EGS model of care: ACS or non-ACS. 260 (18.5%) reported an ACS model. ACS hospitals had a higher median proportion of women surgeons (17 vs 0, $p < 0.001$) in comparison to non-ACS hospitals. The proportion of women surgeons providing EGS care at hospitals using an ACS model of care is shown in Fig. 2b. Table 3 shows the association between the proportion of women surgeons and self-declared ACS model for EGS care. When modeling the odds of ACS vs non-ACS models for EGS delivery relative to the proportion of women, we found that compared to hospitals with zero women surgeons providing EGS care, hospitals with 1–15% and >40% women EGS surgeons were no more likely to have an ACS model. However, hospitals with 16–25% women EGS surgeons [aOR 1.6 (95% CI 1.0,2.6)] and 26–40% women surgeons [aOR 1.9 (95% CI 1.2,3.0)] women EGS surgeons were more likely to have an ACS model for EGS care (Table 4).

Discussion

In our national survey of EGS practice patterns, we were able to reveal hospital and professional characteristics related to women surgeon involvement in EGS care delivery nationally. While half of the hospitals do not have a single woman surgeon providing EGS care, hospitals with ACS models have a higher engagement of women, though this association between more women surgeons and ACS models fades as the proportion of women exceeds 40%. However, the relative over-representation of women providing EGS care within ACS models may be due to the inherent desirability of such care model paradigms or a number of factors that align with generational trends.

A team-based approach to providing EGS coverage may be more appealing to women surgeons. For residents considering ACS fellowship, 70% identified the potential for shift work and a controllable lifestyle as drivers towards ACS.[19] In hospitals that transitioned from a traditional general surgeon on call model to dedicated teams with more shift work, surgeons' satisfaction increased.[25] In particular, academic surgeons appreciated having more dedicated time for research during non-clinical weeks.[25] Gendered attitudes regarding surgical shift work have been noted in that men were more likely to disapprove of such a model ten

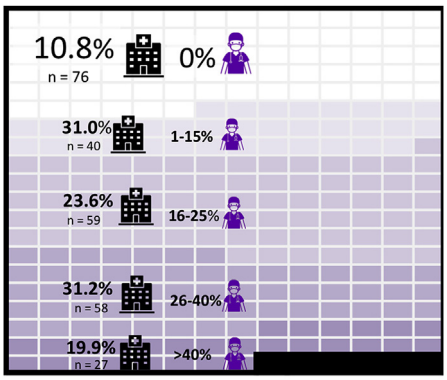
Table 1
Proportion of women surgeons providing emergency general surgery care at 1,546 US hospitals in 2015 by hospital characteristics.[a].

	0	1–15%	16–25%	26–40%	>40%	P value
Hospitals n (%)	779 (50.4)	143 (9.3)	277 (17.9)	201 (13.0)	146 (9.4)	<0.001
Ownership (n = 1536)						
Non-Governmental	525 (67.7)	117 (82.4)	192 (70.1)	147 (73.9)	109 (75.2)	<0.001
Governmental	161 (20.7)	13 (9.2)	45 (16.4)	30 (15.1)	26 (17.9)	
Investor-owned	90 (11.6)	12 (8.5)	37 (13.5)	22 (11.1)	10 (6.9)	
Location (n = 1536)						
Urban	609 (78.5)	141 (99.3)	269 (98.2)	181 (91.0)	110 (75.9)	<0.001
Rural	167 (21.5)	1 (0.7)	5 (1.8)	18 (9.0)	35 (21.4)	
Inpatient Bed Capacity (n = 1536)						
≥500 Beds	36 (4.6)	33 (23.2)	40 (14.6)	45 (22.6)	15 (10.3)	<0.001
400-499	23 (3.0)	23 (16.2)	19 (6.9)	12 (6.0)	4 (2.8)	
300–399 beds	60 (7.7)	20 (14.1)	33 (12.0)	21 (10.6)	6 (4.1)	
200–299 beds	90 (11.6)	39 (27.5)	52 (19.0)	22 (11.1)	14 (9.7)	
<200 beds	567 (73.1)	27 (19.0)	130 (47.4)	99 (49.7)	106 (73.1)	
Teaching Status (n = 1546)						
Major	32 (4.1)	31 (21.7)	35 (12.6)	47 (23.4)	13 (8.9)	<0.001
Minor	265 (34.0)	83 (58.0)	134 (48.4)	76 (37.8)	37 (25.3)	
Non-teaching	482 (61.9)	29 (20.3)	108 (39.0)	78 (38.8)	96 (65.8)	
Medical School Affiliation (n = 1536)						
Yes	203 (26.2)	91 (64.1)	132 (48.2)	98 (49.2)	40 (27.6)	<0.001
No	573 (73.8)	51 (35.9)	142 (51.8)	101 (50.8)	105 (72.4)	
Trauma Certification (n = 1461)						
Yes	332 (45.2)	84 (60.4)	136 (52.3)	115 (59.6)	75 (56.0)	<0.001
No	403 (54.8)	55 (39.6)	124 (47.7)	78 (40.4)	59 (44.0)	

[a] Totals do not equal 1,546 due to missing values in American Hospital Association Data.

Table 2
Proportion of emergency general surgeons with listed professional characteristics by proportion of women surgeons providing emergency general surgery care at hospitals (N = 1546) in the US in 2015.

	0	1–15%	16–25%	26–40%	>40%	P value
Median # surgeons [IQR]	3.0 [2.0,5.0]	8.0 [7,11]	6.0 [4,8]	5.0 [3,8]	3.0 [2,5]	<0.001
Median % >65 years old [IQR]	0 [0,14]	0 [0,13.5]	0[0,17]	0 [0,14]	0 [0,10.5]	0.094
Median % of Recently Trained [IQR]	0 [0,12]	13 [0,20]	13 [0,25]	13 [0,33]	11 [0,33]	<0.001
Median Percentage of Surgeons by Employment Model as Follows [IQR]						
Hospital Employed	100 [50,100]	56.5 [18,100]	75 [40,100]	100 [60,100]	100 [67,100]	<.001
Academic	0 [0,30]	62 [9,100]	83 [0,100]	100 [33,100]	80 [0,100]	<.001
Private	83 [40,100]	87 [50,100]	75 [33,100]	67 [66,100]	100 [50,100]	0.083
Other	0 [0,100]	19 [0,43]]	25 [0,50]	67 [0,100]	86 [8,100]	0.12
Median Percentage of Surgeons in Non-Clinical Roles [IQR]						
Surgical Education	36 [25,80]	22 [13,31]	25 [17,50]	33 [14,50]	32 [17,50]	<.001
Any Research	25 [10,50]	29 [14,43]	34 [19.5,75]	43 [27,83]	50 [30,100]	<.01
Community Outreach	41 [25,81.5]	14 [10,43]	25 [17,50]	31 [21,43]	50 [29,92]	<.01
Administration	50 [25,75]	14 [13,29]	25 [20,40]	33 [20,43]	33 [25,50]	<.001
Other	33 [14,50]	14 [5,42]	23 [15,57]	33 [11,33]	63 [20,86]	0.57
Median Percentage of Surgeons Holding Additional Degrees [IQR]						
MPH	25 [17,50]	11.5 [7,14]	8 [7,17]	11 [30,17]	11.5 [8,14]	<.01
MBA	25 [17,33]	7 [6,13]	11 [8,13]	17 [13,17]	41.5 [17,50]	<.01
MHA	50 [20,50]	3 [0,6]	6 [6,6]	7 [7,33]	4 [0,8.5]	0.25
MSEd	5 [0,10]	5 [0,10]	19.5 [10,31.5]	17 [10,17]	0 [0,11]	0.13
MS	25 [14,33]	13 [8.5,14]	17 [17,25]	29 [10.5,33]	8.5 [8,50]	0.18
PhD	29 [20,14.5]	12 [7.5,15.5]	12 [8,18.5]	14 [10,17]	13 [10,33]	<.05
Other	33 [20,50]	13 [8,13]	18.5 [17,20]	33 [17,33]	9 [4,30]	<.05
Median Percentage of Surgeons Board Certified or Eligible [IQR]						
Surgery Board Certification	100 [100,100]	100 [100,100]	100 [100,100]	100 [100,100]	100 [100,100]	0.79
Critical Care Board Certification	25 [11,50]	22 [13,64]	40 [23,83]	46 [27,93]	60 [30,88]	<.001
Other	25 [0,50]	13.5 [13,14]	15 [5,25]	17 [13,33]	50 [33,50]	0.019
Median Percentage of Surgeons with Additional Specialty Training [IQR]						
Acute Care Surgery	20 [0,60]	15.5 [8,38]	25 [13,67]	14 [9,22]	20 [10,33]	0.356
Burn Surgery	13 [0,40]	0 [0,11]	17 [10,22]	20 [7,28]	14 [10,29]	0.386
Surgical Critical Care	33 [14,50]	21 [13,43]	33 [20,67]	50 [29,82]	50 [25,86]	<.001
Trauma Surgery	29 [14,50]	24 [11,47]	41 [25,67]	44 [31,79]	50 [25,100]	<.01
Breast Surgery	25 [0,50]	13 [7,14]	17 [9,25]	17 [13,33]	17 [8,50]	0.126
Colorectal Surgery	20 [13,33]	13 [9,18]	17 [13,21]	17 [11,29]	25 [17,50]	<.001
Endocrine Surgery	14 [0,50]	13 [8,18]	13 [8,25]	8.5 [0,14]	15 [11,20]	0.717
Hepatobiliary Surgery	17 [7,43]	9 [7,14]	13.5 [10,20]	17 [8,27.5]	25 [20,50]	0.077
Minimally Invasive Surgery	25 [17,44]	19.5 [13,30]	25 [17,33]	21 [14,33]	25 [14,42]	0.083
Thoracic Surgery	17 [10,33]	14 [0,14]	20 [12,25]	12 [3.5,27]	25 [25,50]	0.164
Surgical Oncology	20 [12,33]	13 [8,14]	17 [11,20]	15.5 [10,22]	22 [13,33]	0.017
Vascular Surgery	25 [20,33]	19 [13,29]	20 [13,25]	15.5 [8,33]	25 [25,33]	<.01
Other	33 [20,40]	14 [13,20]	25 [17,33]	20 [14,33]	18.5 [11,25]	0.059



B

Fig. 2b. The Proportion of Women Surgeons Providing Emergency General Surgery Care via an Acute Care Surgery Model in 260 Hospitals in the US in 2015. Each rectangle in this figure represents one hospital providing emergency general surgery (EGS) care using an acute care surgery (ACS) model, 260 in total. The hospitals have then been divided based on proportion of women surgeons: 0%, 1–15%, 16–25%, 26–40%, and >40%. Within each category in the figure, the number and percentage of hospitals is highlighted. Of note, 10.8% or 76 hospitals using an ACS model have zero women surgeons providing EGS care.

Table 3
Proportion of women surgeons providing emergency general surgery care at 1,405 US hospitals in 2015 by self-declared approach to EGS care delivery.

	0	1–15%	16–25%	26–40%	>40%	P value
Acute Care Surgery Model						
Yes	76 (10.8)	40 (31.0)	59 (23.6)	58 (31.2)	27 (19.9)	<0.001
No	628 (89.2)	89 (69.0)	191 (76.4)	128 (68.8)	109 (80.1)	

Table 4
Unadjusted and Adjusted[a] Odds Ratios of Acute Care Surgery Hospitals (N = 260) vs. Non-Acute Care Surgery Hospitals (N = 1,145) in the US by Proportion of Women Surgeons Providing Emergency General Surgery Care.

	Odds Ratio	95% CI	Adjusted Odds Ratio	95% CI
Percentage of Women Surgeons				
0%	Reference	Reference	Reference	Reference
1–15%	3.7	2.4–5.8	1.5	0.9-2.6
16–25%	2.6	1.8-3.7	1.6	1.0–2.6
26–40%	3.7	2.5–5.5	1.9	1.2–3.0
>40%	2.0	1.3–3.3	1.4	0.8-2.6

[a] Adjusted for hospital ownership, location, inpatient bed capacity, teaching status, medical school affiliation, and trauma center designation as reported to the American Hospital Association Annual Survey.

years ago.[26] These findings lend credence to why some women may find the prospect appealing. The possibility of more shift work may be particularly attractive to women surgeons since many are responsible for more domestic responsibilities than their male surgeon counterparts.[27] A more stable and predictable schedule might have benefits for balancing professional and personal responsibilities. Conversely, EGS coverage is a round-the-clock proposition, with 20–48% of EGS operations performed at night.[28–30] This burden of after-hours responsibilities, many including in-house coverage, may not be appealing.[20] Additionally, a collaborative, team-based model has been advocated as one solution to making surgery more inclusive for women.[31] This is supported by the finding that women surgeons have been found to prefer communal colleagues, regardless of gender.[32] Thus, in addition to the appeal of a more predictable lifestyle, women surgeons may be drawn to the overall communal culture that an ACS model fosters. This may include opportunities for research or community outreach, which we found were more pronounced among settings with increased proportions of women surgeons.

On the other hand, the alignment of women in hospitals using ACS models for EGS care might reflect generational trends more than gendered trends. Millennials, regardless of gender, have been found to prioritize lifestyle concerns and be more interested in part-time work.[33] Surgery residents, in general, reference lifestyle when talking about the appeal of ACS.[18,19] Additionally, younger surgeons as a group may prefer practices that are larger, urban, and within teaching hospitals—factors found to be tied to the prevalence of women surgeons in our study, but also to ACS practices more generally in prior studies.[17,34] For example, ACS practices and practices with a higher proportion of women are more common in urban areas.[17,34] At the same time, there is a growing concern about surgeon shortages,[2–5] especially in rural areas.[34,35] Considering these factors, it is possible that the trends we observe in women within ACS hospitals are partially driven by generational changes. Nevertheless, women surgeons are more likely to have a spouse who works full-time compared to men surgeons.[27] Hence, the choice of urban location might, in fact, be more gender-based as dual-professional households may find it easier to find work in urban areas with many industries.

While our results illuminate factors that may draw women surgeons to work within ACS models to provide EGS care, the survey responses also reveal gender disparities among EGS providers overall. Even at hospitals with ACS models, many reported zero women surgeons. A sizeable number of EGS hospitals without a single woman surgeon are teaching hospitals, some even associated with medical schools. A systematic review evaluating what factors impact students deciding whether or not to become surgeons, emphasized the importance women medical students place on same-gender role models within surgery.[36] This suggests that the lack of female representation within many EGS practices may reduce the specialty's ability to recruit talented women who could expand the overall EGS workforce. Given the ongoing workforce shortage concerns mentioned previously, these lost opportunities to recruit more women students into the field of surgery should be addressed.

Our findings must be understood in the context of study limitations. As with any self-reported survey, there is the potential for a lack of generalizability, recall bias or social desirability bias. Additionally, while the 60% response rate is impressive for the study type and for surgeon respondents, there is the possibility that the 40% of EGS practices that did not complete the survey would have changed the results. Additionally, the survey did not ask questions regarding race, ethnicity or sexual orientation of surgeons, preventing any intersectional analysis on how race, gender, and sexuality might impact EGS workforce characteristics. As the survey was developed to study EGS delivery primarily, there are components of being an inclusive workplace for women that were not studied, e.g. onsite childcare, maternity/paternity leave, etc. Given the parallel growth in women surgeons completing training and recent development of ACS models of care for EGS delivery, the increased prevalence of women in ACS models may merely be an ecologic trend. Certainly, in our study, we found that practices without women were more likely to have no newly trained surgeons while practices with >40% women had a median of 11% newly trained surgeons. An underlying relationship is also suggested by similar hospital characteristics found to have high proportions of women and previously demonstrated characteristics of ACS hospitals. For example, both ACS hospitals and hospitals with more women, generally, cluster in larger, urban teaching centers.[17,37]

Conclusion

The national EGS workforce overview provided by our study highlights the continued dearth of women surgeons providing EGS care, even as seen as role-models through the eyes of medical students. Our study also illuminates some of the underlying characteristics of the ACS subspecialty that may draw women surgeons: urban, academic, and staffed by a higher proportion of newly trained surgeons. Evaluating how the profession can be inclusive and effectively support the current pool of talented women surgeons as well as those coming from training to enter careers that include EGS care delivery merits additional investigation.

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Financial conflicts of interest

Dr. Santry is a paid consultant by the Johnson & Johnson Company for service on a fragility fracture advisory board. The content herein is unrelated to the topic of the advisory board and is in no way supported by the Johnson & Johnson Company.

Appendix 1. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amjsurg.2019.07.008.

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