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The General Surgery Job Market: Analysis of Current Demand for General Surgeons and Their Specialized Skills

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Abstract

BACKGROUND—The majority of general surgery residents pursue fellowships. However the relative demand for general surgical skills versus more specialization is not understood. Our objective was to describe the current job market for general surgeons and compare the skills required by the market to those of graduating trainees.

STUDY DESIGN—Positions for board eligible/certified general surgeons in Oregon and Wisconsin from 2011 to 2012 were identified by review of job postings and telephone calls to hospitals, private practice groups, and physician recruiters. Data was gathered on each job to determine if fellowship training or specialized skills were required, preferred, or not requested. Information on resident pursuit of fellowship training was obtained from all residency programs within the represented states.

RESULTS—Of 71 general surgery positions available, 34% of positions required fellowship training. Rural positions made up 46% of available jobs. Thirty five percent of positions were in non-academic metropolitan settings and 17% were in academic metropolitan settings. Fellowship training was required or preferred for 18%, 28%, and 92% of rural, non-academic, and academic metropolitan positions respectively. From 2008 to 2012, 67% of general surgery residents pursued fellowship training.

CONCLUSIONS—Most general surgery residents pursue fellowship despite the fact that the majority of available jobs do not require fellowship training. The motivation for fellowship training is unclear but residency programs should tailor training to the skills needed by the market with the goal of improving access to general surgical services.

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INTRODUCTION

There is a current shortage of general surgeons nationwide.¹⁻³ A growing elderly population and ongoing trends toward increased healthcare utilization have contributed to a higher demand for surgical services, without a corresponding increase in supply of surgeons.^{1, 4} The number of general surgeons per 100,000 people in the United States declined by 26% from the 1980s to 2005.⁵ Cumulative growth in demand for general surgery is projected to exceed 25% by 2025. The Association of American Medical Colleges has projected a shortage of 41,000 general surgeons by 2025.⁶ General surgeons make up 33% of the total projected physician shortage, the second highest after primary care physicians who make up 37% of the total shortage. In an effort to remedy this, the Affordable Care Act of 2010 mandated that 75% of new residency positions be in either primary care or general surgery.⁷ The Act also outlined an incentive program for surgical services in geographic areas with health professional shortages, particularly in rural areas, to promote a more proportionate distribution of general surgeons across the country.

Despite the demand for general surgeons, the percentage of general surgery trainees going directly into practice is decreasing while the percentage of trainees pursuing subspecialty training is increasing.⁸ This trend is projected to lead to a further shortfall of general surgical services if specialists entering the workforce narrow their scope of practice.⁹ A recent study reported that graduating residents who lacked confidence in their skills to operate independently were more likely to pursue subspecialty training.¹⁰ This suggests that some graduating residents are motivated to obtain subspecialty training to gain more experience rather than narrow their clinical scope of practice. Given the projected shortage of general surgeons,^{6,9} this will be a crucial distinction when reforming surgical education.

General surgery trainees interested in career planning would benefit from understanding the demand for general and/or specialty skills in a job market heavily influenced by a constant stream of new graduates. However, little is currently known about the demand for subspecialty versus general surgical skills in the current job market. The goal of this study is to describe the current job market for general surgeons in the United States, using Oregon and Wisconsin as surrogates. Furthermore we sought to compare the skills required by the job market to those of graduating trainees with the goal of gaining insight that might assist in workforce planning and surgical education reform.

METHODS

Design

This was a cross-sectional study of all recently filled or available positions for recently graduated, board eligible or board certified general surgeons in Oregon and Wisconsin from November 2011 to June 2012.

Data Collection

Demand for General Surgeons—Available or recently filled positions for general surgeons were identified by the following: 1) review of job postings listed on the health careers website of the American College of Surgeons <http://www.healthcareers.com/ACS>,

2) review of job postings listed on the websites for hospitals and health systems in the state, 3) telephone interviews with hospital and surgical private practice group representatives in the state, 4) telephone interviews with physician recruiters listed on job postings.

Positions initially identified from job postings were confirmed by telephone interview to obtain further details about the position and avoid over-counting positions with multiple postings. Jobs that were open within one year of the study period were included. Positions for division chiefs, directors, or department chairs were not included in the analysis, in order to focus on the positions available for graduating residents and fellows.

The research team was unable to contact employer representatives for 1 position in Oregon and 12 positions in Wisconsin to fully verify details of the job requirements. Therefore, for these positions, all required or preferred skills (i.e. fellowship training and specialty practice) were determined from the job posting.

Supply of General Surgeons—Information on fellowship training of graduates from general surgery residency programs in each state was obtained from residency program websites and program director/administrator communications.

Analysis

Demand for General Surgeons—The number of available general surgery positions was calculated for each state. Data were gathered on each general surgery position to determine whether the surgical practice sought a general surgeon with fellowship training, a general surgeon with no additional training, or a non-fellowship-trained surgeon with particular interest and skills for a specialized practice. General surgery positions requiring fellowship training included: breast oncology, surgical oncology, endocrine surgery, minimally invasive surgery, colorectal surgery, vascular surgery, cardiothoracic surgery, and trauma/critical care with or without burn training. Specialized skills for non-fellowship-trained surgeons included obstetrics and gynecology, endoscopy, colonoscopy, advanced laparoscopy as well as endocrine or breast surgery. Although there are fellowships available in some of these disciplines, there was not a request associated with these positions for additional training beyond what was acquired during general surgery residency.

The numbers of positions requiring fellowship training were calculated and compared to the numbers of positions for general surgeons with no additional training versus the numbers of positions for general surgeons with the above mentioned specialized skills and interests. For those employers that did not require fellowship training but preferred specialized skills, for many, the lack of specialized skills was not an absolute barrier to employment.

Positions were classified as serving rural/non-metropolitan areas or metropolitan areas based on the job posting location description, local population size, and USDA Economic Research Service rural-urban continuum code¹¹ for the location of the hospital. Positions were also classified as academic or non-academic based on medical school affiliation.

A stratified analysis was then performed to calculate the numbers of rural versus non-academic metropolitan and academic metropolitan positions requiring fellowship training or non-fellowship-trained surgeons with specialized skills.

Supply of General Surgeons—The number of general surgery residents who pursued fellowship training was calculated in proportion to the total number of general surgery graduates in each state from 2008 to 2012. The state of Oregon has one residency program and the state of Wisconsin has four programs. Complete information on all graduates was obtained from residency program websites or by email and phone communication with program directors and administrators, who supplied lists of their graduating residents that specified resident career plans after completing their general surgery training.

RESULTS

Demand for General Surgeons—During the study period, 71 positions for board eligible or board certified general surgeons were available in Oregon and Wisconsin. Twenty-seven jobs were available in Oregon and 44 were available in Wisconsin (Figure 1). In both states combined, 24 (34%) positions required fellowship training (Table 1). Of the positions for fellowship-trained surgeons, 1 was in breast oncology (1% of all positions), 1 in surgical oncology (1%), 2 in endocrine (3%), 5 in minimally invasive (7%), 1 in colorectal (1%), 5 in vascular (7%), 5 in cardiothoracic (7%), and 4 were in trauma/critical care with or without burn surgery (6%).

Among the positions for non-fellowship-trained surgeons, 30 (42%) preferred some specialized skill. Obstetrics and gynecology experience was a desired skill set for 19 (43%) positions in Wisconsin and none in Oregon. Endoscopy skills were preferred for 5 (7%) positions in both states. Advanced laparoscopy skills were preferred for 4 (6%) positions. A non-fellowship-trained surgeon with a practice focus in breast was requested by 1 (1%), and also an interest in endocrine surgery by 1 (1%).

Stratified Analysis of Demand by Rural versus Non-academic and Academic Metropolitan Settings—Thirty-three general surgery jobs were located in rural areas, with 9 rural positions in Oregon (35% of positions in OR) and 24 rural positions in Wisconsin (54% of positions in WI). One position in Oregon was excluded from the stratified analysis because no specific information about location was provided.

Only 6 (18%) rural positions in Oregon and Wisconsin required fellowship training. Seven (28%) of the non-academic metropolitan positions and 11 (92%) of the academic metropolitan positions required fellowship training. Among the positions for non-fellowship-trained general surgeons, obstetrics and gynecology skills were preferred for 15 (46%) rural positions, 4 (16%) non-academic metropolitan positions, and no academic positions. Endoscopy was preferred in the surgical practices of 3 (9%) of the rural positions, 2 (8%) of the non-academic metropolitan positions, and none of the academic metropolitan positions.

Supply of General Surgeons—From 2008 to 2012, 134 residents completed a general surgery residency in Oregon or Wisconsin (58 Oregon, 76 Wisconsin). Of these graduating general surgery residents, 38 (66%) in Oregon and 52 (68%) in Wisconsin pursued fellowship training. The fellowships pursued are listed in Table 2.

In order to assess practice emphasis and competing fellowship experience at each residency program, the types of fellowships coexistent with each residency program were compared. The fellowships offered in Wisconsin include cardiothoracic (1 fellowship), critical care (1), endocrine (2), hepatopancreaticobiliary (1), minimally invasive (2), pediatrics (1), transplant (1), and vascular (2). Most of these fellowships were offered at either University of Wisconsin (4 fellowships) or Medical College of Wisconsin (6 fellowships) while Marshfield has no fellowship programs and Gunderson has a minimally invasive surgery fellowship only. The fellowships offered in Oregon at Oregon Health and Science University include colorectal, critical care, cardiothoracic, hepatopancreaticobiliary, minimally invasive, pediatric, and vascular surgery. The decision to pursue a fellowship and the types of fellowships pursued by residency program graduates did not correlate with the existence of specialty fellowships or the types of fellowship programs at that site. Specific practice location was known for all Oregon graduates and 47 (62%) Wisconsin graduates. Among all Oregon graduates, 30 (52%) remained in Oregon. Of the 20 Oregon graduates who did not pursue fellowship, 11 (55%) remained in Oregon, 1 (5%) left Oregon but stayed in the Pacific Northwest, and 9 (40%) left the Pacific Northwest entirely. Out of the 47 Wisconsin graduates with known practice locations, 17 (36%) remained in Wisconsin after graduation. Of the 24 Wisconsin graduates with known practice locations who did not pursue fellowship, 11 (46%) went into practice in Wisconsin, 9 (38%) left Wisconsin but remained in the Midwest region, and 4 (17%) left the Midwest to practice general surgery elsewhere.

DISCUSSION

Findings from this study identify a disparity between the training that general surgery trainees pursue and the skills that general surgery employers seek. While almost 70% of trainees in both states sought fellowship training in general surgery subspecialties, a number consistent with other previously published national reports,^{8,10} fellowship was required for only 34% of the available positions. These data suggest that twice as many fellowship-trained surgeons are produced compared to what are needed. Although the majority of positions for general surgeons did not require fellowship, a large proportion preferred a specialized skill set. The supply of general surgeons relative to subspecialists has been suggested to have important financial implications. As recently described by Ricketts et al,¹² a higher general surgeon to population ratio correlated with lower Medicare costs, while the opposite was true if the ratio favored subspecialists. Accordingly, the disparity between the supply of general surgeons and subspecialists likely contributes to greater costs to our healthcare system, which is already financially strained.

In Oregon there were 0.70 postings per 100,000 people, and in Wisconsin there were 0.77 per 100,000. Given variations in the market, these two figures likely represent similar overall demand for general surgeons. However, it is clear that graduates in both states are

not filling the demand of their respective geographic regions. In both states combined, fewer than 6 graduates per year were known to stay in their respective state to fill a general surgery job despite the availability of 17 positions in the two states over a similar time period.

This study suggests geographic variation in the individual skills sought in the general surgery job market, despite a rather similar overall demand. There were marked differences between the two states with regard to the preferred skill sets. Specifically, experience with obstetrics and gynecology was preferred by nearly half the Wisconsin employers, but not at all in Oregon. This may reflect regional differences in the medical-legal environment; a more litigious environment in Oregon as compared to Wisconsin may prohibit Oregon general surgeons from performing obstetric or gynecologic procedures on a regular basis. Alternatively, the supply and practice pattern of trained obstetrician gynecologists and family practitioners may also be different in the two states. A recent study of the Dakota Database of Rural Surgery revealed that rural surgeons performed 1,063 OB/GYN procedures in one year, including caesarian sections, tubal ligations, and hysterectomies; this accounted for 2.3% of the 46,052 procedures performed that year by rural general surgeons.¹³ Endoscopy is a skill set which constitutes a large part of many general surgeons' practice; estimated to be 39% of all procedures performed by rural general surgeons in the Dakota Database. Yet only 7% of employers in the current study specifically sought advanced endoscopy skill. This is likely because employers believe sufficient endoscopy experience is provided during general surgery residency, which is currently defined by 35 upper endoscopies and 50 colonoscopies. Endoscopic proficiency is not yet defined by any quantifiable metric¹⁴ but newly introduced programs such as the Society of American Gastrointestinal and Endoscopic Surgeons' (SAGES) Fundamentals of Endoscopic Surgery (FES) curriculum and assessment tool seek to provide an objective measure of endoscopic proficiency,¹⁵ and may provide a more reliable tool for employers and accrediting agencies to assess whether a surgeon is competent to perform endoscopic procedures.

This study is limited by the fact that it is a small sample of the US job market, covering only 3.1% of the US population,¹⁶ and therefore is not a comprehensive evaluation of the US. However, it is a comprehensive evaluation of two states and, in many respects, these two states reflect an important sample of the overall US job market. Both states contain major metropolitan centers with several intermediate sized cities, and a population that is otherwise widely distributed across vast areas of land serviced by regional medical centers and small community hospitals. This is similar to most other states in the country. A recent study used US census data to identify states that are most representative of the US population.¹⁷ According to statistics on race and ethnicity, income and education, housing prices and neighborhoods, Wisconsin was the most representative state and Oregon was the seventh most representative state for the US population. Given similar population profiles and similar referral structures, it is reasonable to believe that Oregon and Wisconsin demonstrate similar needs for general surgical services as most of the United States, supporting the external validity to this study.

When examining the internal validity of the study, it is worth noting the strengths and limitations of sampling general surgery job postings and residency graduates' training choices. The duration of time that a job posting is available varies widely, which could

potentially introduce bias favoring jobs that are hard to fill, and the market is a dynamic entity which could change significantly over the course of a prolonged study period. Accordingly, in this study we elected to take a relative snapshot of the market, restricting our search for general surgery positions to 12 months, to limit such bias. In order to adequately assess the supply of general surgery residency graduates, career paths of graduates were assessed for four years preceding the 12 months studied. We included this longer window of “workforce supply” in order to eliminate the small sample variability that may have occurred if we only sampled a single year of residency graduates. As it turned out, the interests of the graduating resident were relatively consistent over this four year period, and we could not detect differences in resident preferences in any year of our four year sampling period. Although public institutions are required to post all job openings, not every general surgery job opening is publicly advertised and there are no universal standardized requirements for how jobs may be posted and what information is included. Practices may hire a new partner directly out of fellowship or after a particularly positive interaction at a national meeting. By nature, such hiring is difficult to quantify and could not be fully accounted for in our study. Nevertheless, this study involved a comprehensive search for open general surgery positions that we believe resulted in representative samples from each state. These samples demonstrated a consistent demand for general surgeons that is therefore likely to be generalizable to other areas of the United States. Additionally, this study achieved 100% capture of the supply of general surgery graduates from these two states from 2008 to 2012. However, general surgery residents’ training choices could only be captured at the time of residency graduation, which meant that choices to pursue fellowship training after years of practice were not observed. The factors that influence the skill sets of graduating residents are numerous and difficult to quantify. We attempted to address this by correlating the coexistence of fellowships and residencies with the decision to go directly into training or to pursue fellowships; we found no significant correlation. Despite these limitations, this sampling of graduates and job postings allowed an insightful comparison of supply and job market demand for general surgeons.

Many organizations within the profession of general surgery have an opportunity to contribute to changes in surgical training that will promote comprehensive and rural general surgery as an attractive career path, and thus help meet the demand for general surgeons without forced intervention by outside authorities. Foremost among these national organizations is the American College of Surgeons, who recently issued the American College of Surgeons Statement on Healthcare Reform¹⁸ in which it identified three core areas of concern; 1) Quality and Safety, 2) Access/Workforce, and 3) Reduction of Healthcare Costs. Under the topic of Access/Surgical Workforce, the ACS states that it is committed to five specific efforts:

1. Providing educational programs to address new paradigms of surgical specialists and the delivery of surgical care in order to ensure that there is an adequate workforce to supply high-quality care through the changing delivery system.
2. Focusing research and advocacy efforts in order to gain an understanding of the challenges that exist in attempting to ensure the availability of a sufficient, yet

flexible, surgical workforce that will provide equitable access to quality and timely health care.

3. Developing systems to eliminate disparities in the availability and delivery of surgical and other health care in America.
4. Conducting research on the adverse impact of the declining surgical workforce, focusing on rural and underserved hospitals and providing analysis for the national health workforce database.
5. Providing educational outreach and respite support for surgeons practicing in rural and underserved areas in order to maintain a surgical workforce in these areas.

The American College of Surgeons is actively attempting to address this very important problem, but if it has any chance of success in these five efforts, it will need to start by recognizing the disparity in the skill sets attained by current trainees and those needed by the patients that American general surgeons strive to serve. It will then need to support research that further characterizes the specific skill sets that are in fact needed by the American public, and support new training paradigms specifically tailored to these skill sets. This study may be a first step in providing this support by determining the specific skill sets that are desired and characterizing the disparity in what is provided by current training paradigms and what is in demand by the workforce. Further investigation must be done to determine exactly why trainees are seeking alternate skill sets, what could incentivize them to seek skill sets that are in need by the underserved populations within the United States, and how best to train future generations of general surgeons in an efficient and efficacious manner to optimally serve all of our patients.

CONCLUSION

There is currently a disparity between the skills sought by general surgery trainees and the skill set desired by general surgical employers. This disparity will have important consequences for the quality, cost, and accessibility of general surgical care throughout the United States for years to come. General surgery residency programs should, therefore, ensure that graduates have competency in the skills needed by the job market. General surgery training should be tailored to market demands to increase access to general surgical services, improve quality, and contain costs of care.

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Figure 1.
Study Flow Diagram

Table 1

General Surgery Positions in Wisconsin & Oregon

Job requirements	All Positions		Rural		Nonacademic Metro		Academic Metro	
	n	%	n	%	n	%	n	%
<i>Fellowship required</i>	24	34%	6	18%	7	28%	11	92%
Breast oncology	1	1%	1	3%	0	0%	0	0%
Surgical oncology	1	1%	1	3%	0	0%	0	0%
Endocrine	2	3%	0	0%	0	0%	2	17%
Minimally invasive	5	7%	1	3%	3	12%	1	8%
Colorectal	1	1%	0	0%	0	0%	1	8%
Vascular	5	7%	2	6%	2	8%	1	8%
Cardiothoracic	5	7%	1	3%	1	4%	3	25%
Trauma/CC +/- Bum	4	6%	0	0%	1	4%	3	25%
<i>Fellowship not required</i>	47	66%	27	82%	18	72%	1	8%
General surgery alone	17	24%	5	15%	10	40%	1	8%
<i>Fellowship not required, +Specialized Skills</i>	30	42%	22	67%	8	32%	0%	0%
Breast oncology	1	1%	1	3%	0	0%	0	0%
Endocrine	1	1%	1	3%	0	0%	0	0%
OB/GYN	19	27%	15	45%	4	16%	0	0%
Endoscopy	5	7%	3	9%	2	8%	0	0%
Advanced laparoscopy	4	7%	2	6%	2	8%	0	0%
Total positions	71		33		25		12	

Table 2

General Surgery Graduates in Oregon & Wisconsin 2008–2012

	Both States		Oregon		Wisconsin	
	N	%	n	%	n	%
Fellowship Training						
<i>None</i>	44	33%	20	34%	24	32%
<i>Fellowship Specialty</i>						
Breast	4	3%	0	0%	4	5%
Surgical Oncology	6	4%	2	3%	4	5%
Endocrine	1	1%	0	0%	1	1%
Minimally Invasive	12	9%	3	5%	9	12%
Colorectal	13	10%	7	12%	6	8%
Vascular	13	10%	6	10%	7	9%
Cardiothoracic	10	7%	6	10%	4	5%
Trauma/Critical Care	12	9%	8	14%	4	5%
Burn/ Plastics	9	7%	3	5%	6	8%
Other specialty	10	7%	3	5%	7	9%
Total Graduates	134	100%	58	100%	76	100%