

Surgical Education

# General surgery graduates may be ill prepared to enter rural or community surgical practice

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## Abstract

**BACKGROUND:** Rural/community surgery presents unique challenges to general surgeons. Not only are they required to perform “classic” general surgery procedures, but they are also often expected to be competent in other surgical disciplines.

**METHODS:** Final-year Canadian-trained residents in general surgery were asked to complete the survey. The survey explored chief residents’ career plans for the following year and whether or not they would independently perform various procedures, some general surgical, and others now considered within the domain of the subspecialties.

**RESULTS:** Sixty-four residents (71%) completed the survey. Twenty percent planned to undertake a rural surgical practice, 17% an urban community practice, and 55% had confirmed fellowships. Most residents (>90%) expressed comfort with basic general surgical procedures. However, residents were less comfortable with subspecialty procedures that are still performed by general surgeons in many rural practices.

**CONCLUSIONS:** More than half of graduating general surgery residents are choosing subspecialty fellowship training over proceeding directly to practice. Those choosing a rural or community practice are likely to feel ill prepared to replace existing surgeons.

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In Canada, general surgeons are trained at 17 institutions governed by the Royal College of Physicians and Surgeons of Canada (RCPSC). The RCPSC’s mandate traditionally has been to graduate surgeons who are competent as “generalists,” or comprehensive general surgeons, who can enter into varied community and rural surgery practice or take on additional subspecialty training.<sup>1–3</sup> Indeed, although some suggest that surgery programs are slow in meeting this need, survey data indicate that those currently working in rural and community settings feel their training prepared them adequately for this practice.<sup>1,2,4</sup>

However, contemporary general surgery faces new challenges in training the generalist surgeon. Work hour restrictions,<sup>5–8</sup> limited operative resources, and the explosion of novel techniques<sup>9</sup> all challenge our ability to train a surgeon in the standard period. Additionally, although widely accepted that the ability to operate skillfully will in part ensure good outcomes, groups such as the RCPSC and Accreditation Council for Graduate Medical Education have defined competencies beyond surgical skills to ensure that graduates are compassionate, professional, well-rounded managers and not merely technicians.<sup>10,11</sup>

As training programs evolve to meet these challenges, surgical educators must be mindful of the following long-standing question: what is the expected product of a general surgery residency? Should we expect graduating general surgeons to be comfortable with immediately entering prac-

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tice in a rural or urban community practice, or should we expect that all graduating residents enter subspecialty fellowship training, similar to the 3-year internal medicine system, with rural/community surgery being one of the choices? In an attempt to answer some of these questions, we explored the perceived competencies of graduating general surgery residents in Canada.

## Methods

Final-year Canadian-trained residents scheduled to sit the RCPSC certifying examination in general surgery were asked to participate at the completion of their clinical training. The questionnaire assessed categorically whether or not chief residents would book and independently perform various traditionally related general surgery procedures and a selection of procedures from other surgical disciplines (eg, orthopedics, obstetrics and gynecology, and plastic surgery) that commonly are performed by general surgeons practicing in rural or community environments. The selection of these procedures was based on previously published studies comparing rural versus urban surgical caseloads.<sup>12-15</sup> The survey was piloted on local fourth-year residents for clarity, syntax, and diction.

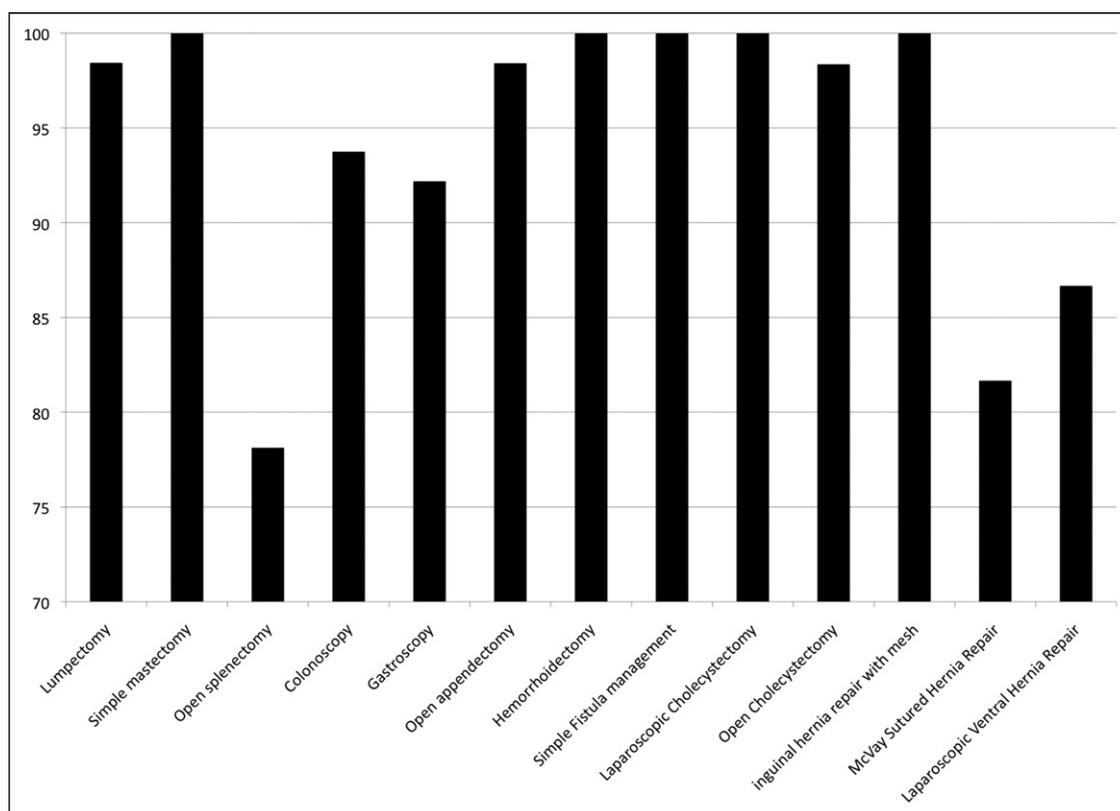
To assess perceived abilities with traditionally related general surgery operations, 68 surgical procedures per-

formed by general surgeons or their subspecialties were identified from the initial list. The authors then each eliminated procedures that were felt to be those of subspecialties (eg, ileal pouch, pancreaticoduodenectomy, and laparoscopic adrenalectomy) and grouped the remaining into organ systems. Procedures that were related (eg, axillary sentinel lymph node biopsies and axillary dissection) but not sufficiently similar (eg, right colectomy and extended right colectomy) were included for this analysis. Discrepancies were resolved by a discussion between the authors to reach a consensus. This yielded a total of 23 procedures grouped into 6 categories for this part of the study. Finally, participants were also asked to indicate their career choices after completion of their training, specifically if they planned to enter urban or rural practice directly or were seeking further fellowship training.

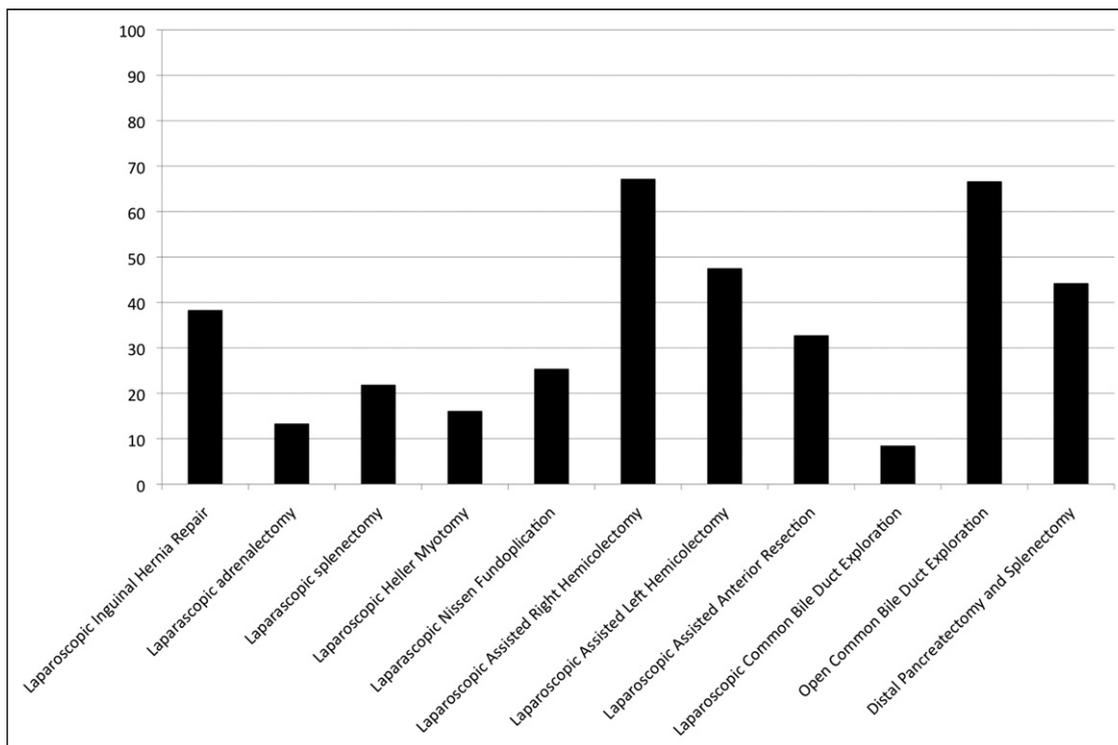
## Results

### Response

A total of 90 chief residents were approached in person at a national chief resident conference to participate in the study with 64 residents (71%) completing the survey.



**Figure 1** The percentage of graduating general surgery residents who would independently perform various traditionally related general surgery procedures.



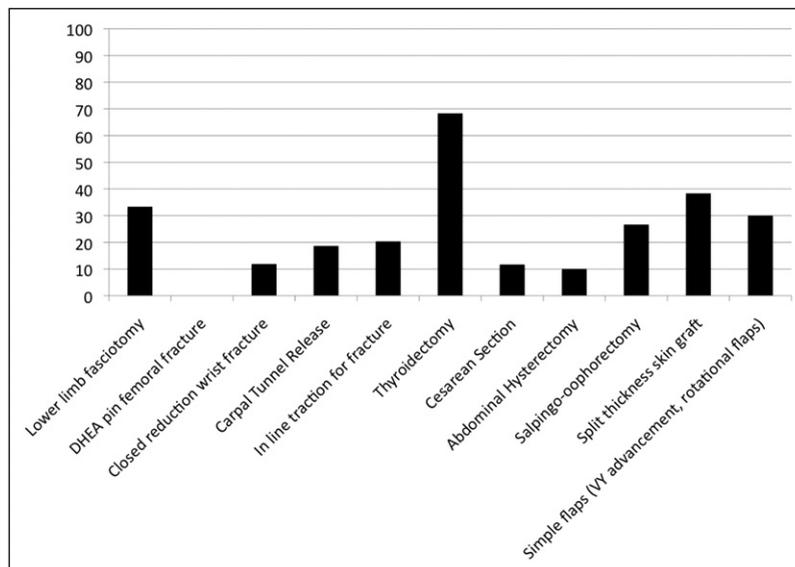
**Figure 2** The percentage of graduating general surgery residents who would independently perform various advanced laparoscopic or specialized general surgical procedures.

**Plans on the completion of the residency program**

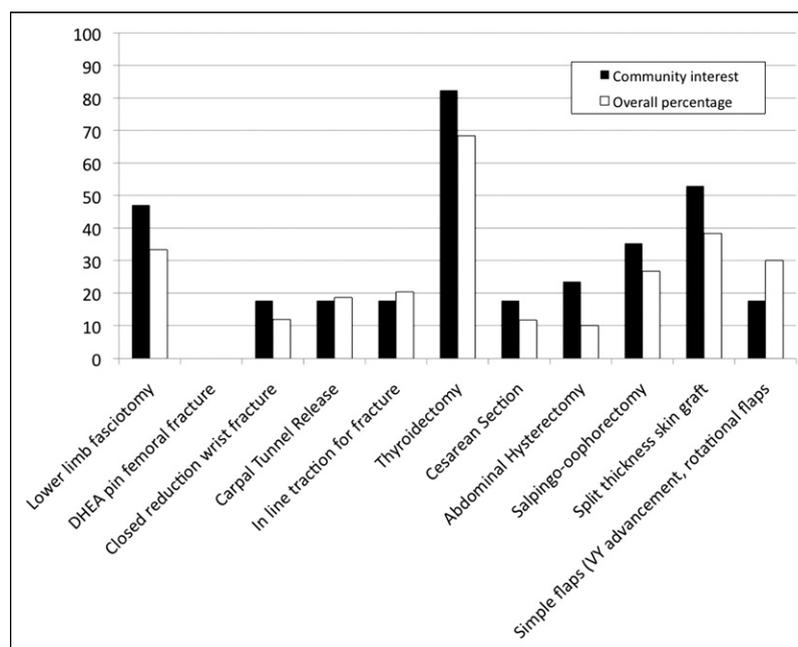
Of the 64 chief residents, 55% (n = 35) of chief residents had confirmed fellowships, 17% (n = 11) planned an urban community practice, and 20% (n = 13) planned to undertake a rural general surgery practice. Eight percent (n = 5) were undecided or not specified.

**Comfort level with surgical procedures**

Most residents (>90%) expressed comfort with basic general surgical procedures including laparoscopic cholecystectomy, appendectomy, mesh hernia repair, simple mastectomy, and hemorrhoidectomy (Fig. 1). Residents were less comfortable with advanced laparoscopic or spe-



**Figure 3** The percentage of graduating general surgery residents who would independently perform various orthopedic, obstetric, gynecologic, and plastic surgery procedures.



**Figure 4** The percentage of graduating general surgery residents with an interest in community surgery (black bar) who would independently perform various orthopedic, obstetric, gynecologic, and plastic surgery procedures compared with all graduating general surgery residents (white bar).

cialized general surgical procedures (Fig. 2). Most residents also responded that they were not comfortable performing select orthopedic, obstetric, gynecologic, and plastic surgery procedures (Fig. 3). This did not differ significantly for residents with an expressed interest in community/rural surgery versus the group as a whole (Fig. 4).

### Related general surgery procedures

Overall, 100% of residents would perform simple mastectomy and lumpectomy, and 89% would perform sentinel lymph node biopsy. However, only 70% would perform a level I to II axillary dissection based on sentinel lymph node biopsy findings. Within colorectal procedures, 84% would perform a low anterior resection or the abdominal component of an abdominal perineal resection, whereas only 55% would perform a perineal dissection. Regarding simple perianal disease, 95% would perform hemorrhoidectomy, banding, or simple fistula management, whereas only 84% would perform a lateral internal sphincterotomy. For gastric disease, 71% would undertake a distal gastrectomy with Billroth II reconstruction, whereas only 29% would perform a total gastrectomy if needed. When questioned about common biliary tract procedures, 97% would perform an open or laparoscopic cholecystectomy, 84% would perform a laparoscopic cholangiogram, and only 62% would perform an open common bile duct exploration. Finally, although 94% of chief residents were comfortable performing inguinal herniorrhaphy with a mesh plug/patch, 24% stated they would not perform a tissue repair.

### Comments

Rural and community surgeons face a variety of unique challenges. Challenges including professional isolation, onerous call schedules, and lifestyle changes for their families<sup>16</sup> have been seen as significant barriers to recruiting surgeons to these practices. A number of studies of general surgery residents in the United States found that between 70% and 80% of surgical residents elect fellowship training after general surgical residency.<sup>17,18</sup> This is in keeping with our current study, which found that only 37% of chief surgery residents in Canada planned to move directly into practice without further training.

One reason for this may be the scope of practice in rural and community settings. The varying caseload seen by rural practitioners far exceeds the practice of most urban surgeons with a greater percentage performing procedures falling into the realm of orthopedics, obstetrics, and gynecology or plastic surgery in urban centers.<sup>12,15,19</sup> A survey of general surgeons in Canada found similar results, with nearly 20% of surgeons performing procedures from plastic surgery or obstetrics and gynecology with most of this work taking place in communities of less than 50,000 people.<sup>4</sup>

A number of studies have examined case logs from surgical practice in rural centers in the United States. These have revealed that procedures from other surgical disciplines (eg, gynecologic [including cesarean sections], orthopedic, and minor plastic procedures) make up a larger percentage than those of their urban counterparts.<sup>20–22</sup> A separate study has shown that volumes in these areas have not changed substantially when compared with case logs

from a decade earlier.<sup>21</sup> This study did reveal a lower percentage of “other specialty procedures” performed by rural surgeons compared with previous studies, but as the authors point out this study is skewed because obstetric and minor plastic procedures are not tracked in the dataset used in this analysis.

A similar analysis of surgical resident operative case logs of graduating chief surgical residents in the United States revealed that graduating surgical residents in 1995 averaged only 1.6 gynecologic cases and 1.1 orthopedic cases per year. In contrast, the rural surgeons in this study averaged 70 and 17.8 gynecologic and orthopedic cases per year, respectively.<sup>22</sup> This mirrors our results that indicate that most graduating surgical residents are not comfortable performing procedures outside the traditional scope of general surgery (Fig. 3) regardless of whether or not they plan to pursue fellowship training or community practice (Fig. 4).

The related procedures analysis underscores these findings. It appears that end-of-training residents also do not feel comfortable performing some procedures within the traditional scope of practice of the generalist general surgeon (Table 1). This is problematic because a general surgeon must be able to alter the operative plan to successfully and safely complete an operative procedure based on unexpected operative findings. For example, when performing axillary sentinel lymph node biopsy, the surgeon must be able to intraoperatively perform a formal axillary dissection as the standard of care if pathologically enlarged lymph nodes are palpated during the case. Likewise, community

and rural general surgeons who take emergency calls must be able to repair an inguinal hernia with either a mesh or tissue repair if indicated intraoperatively (ie, if a bowel resection becomes necessary). These specific skills are set as “Objectives of Training in the Specialty of General Surgery” by the RCPSC.<sup>10</sup>

The question then becomes how do we expect residents to gain competency in these areas? The Canadian study by Pollett and Dicks<sup>4</sup> suggested that nearly half of rural surgeons gained training from senior colleagues in this area only once they entered into practice. However, given that 26% of respondents from communities of less than 50,000 people indicated that they were poorly or only somewhat prepared for their current practice,<sup>4</sup> this does little to promote the recruitment of young surgeons to this challenging environment. Suggestions have included the establishment of rural/community fellowship training programs or rural/community general surgery residency programs.<sup>23–25</sup> Alternatively, American Surgical Associations’ Blue Ribbon Committee on Surgical Education suggested a complete structural revamping of current general surgical residency programs with earlier entry into subspecialty training after 2 to 3 years of basic core surgical education including an option of subspecialty training in rural surgery.<sup>22</sup>

Our study presents the first look at graduating residents’ competencies in Canada. Strengths of this study include the representation of an entire cohort of graduating residents from across Canada as well as a high response rate. Like any survey, the findings of our study have certain limitations in that they represent participants’ perceptions, which may be affected by recall bias. However, the findings serve as a “needs assessment,” identifying significant perceived deficiencies in resident preparation for rural or urban community practice.

**Table 1** Percentage of graduating general surgery residents willing to independently perform a selection of related surgical procedures

Procedure	% comfortable
<b>Breast</b>	
Mastectomy/lumpectomy	100
Sentinel lymph node biopsy	89
Axillary dissection (I/II)	70
<b>Colorectal</b>	
Low anterior/abdominal component of abdominal perineal	84
Perineal component of abdominal perineal	55
<b>Perianal (simple)</b>	
Hemorrhoid/band/fistula	95
Lateral internal sphincterotomy	84
Limited mucosa advancement	23
<b>Biliary</b>	
Laparoscopic/open cholecystectomy	97
Laparoscopic/open cholangiogram	84
Open common bile duct exploration	62
<b>Gastrectomy</b>	
Distal Bilroth I	45
Distal Bilroth II	71
Total	29
<b>Inguinal hernia repair</b>	
Mesh patch/plug	94
Tissue	24

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