Original Article

Preparing general surgery residents for rural practice in British Columbia: Competencies, privileging and geography

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Abstract

Introduction: For general surgeons practising in rural areas, multiple factors influence care beyond skills learned in residency. The British Columbia Privileging Dictionary (BCPD) defines core and non-core procedures that shape the scope of general surgeons. Moreover, the Royal College has adopted a Competence by Design (CBD) curriculum which employs entrustable professional activities (EPAs) that list surgical skill residents must be proficient in by graduation. Our goal is to understand the current practice patterns of rural general surgeons in BC based on these policies and local factors.

Methods: Medical service plan (MSP) data were collected from 2011 to 2021 based on general surgeons working in rural subsidiary agreement (RSA) communities. The MSP fee codes were organised into core or non-core procedures, as outlined by the BCPD. EPAs were assessed and compared to the non-core procedures.

Results: From 2011 to 2021, 223,103 procedures were performed in rural sites in BC. On average, 90.97% (standard deviation = 20.78) of procedures done in all communities were BCPD core procedures. The most common non-core surgical care performed by general surgeons was in plastic surgery (n = 8035). Over 8% of procedures performed were not general surgery EPAs. Notably, none of the EPAs are considered non-core privileges and all EPAs have been performed in rural settings.

Conclusion: General surgeons working in rural settings perform multiple procedures outside of EPAs which account for over 8% of their caseload and approximately 6% of procedures performed are non-core privileges. This provides some insight into the potential limitations of the BCPD on graduates hoping to practise in rural communities. As the CBD curriculum has been reported to provide a more flexible approach to learning, it may be tailored to suit residents' learning and career goals, including varied surgical skills to suit rural needs.

Keywords: Medical education, residency, rural surgery

Résumé

Introduction: Pour les chirurgiens généraux exerçant en zone rurale, de multiples facteurs influencent les soins, et ce au-delà des compétences acquises en résidence.

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Le British Columbia Privileging Dictionary (BCPD) définit les procédures essentielles et non essentielles qui déterminent le champ d'action des chirurgiens généraux. En outre, le Collège royal a adopté un programme d'études intitulé « La compétence par conception » (CPC) qui utilise des activités professionnelles confiables (APC) qui énumèrent les compétences chirurgicales que les résidents doivent maîtriser avant d'obtenir leur diplôme. Notre objectif est de comprendre les modes de pratique actuels des chirurgiens généralistes ruraux en Colombie-Britannique en fonction de ces politiques et des facteurs locaux.

Méthodes: Les données du Medical Service Plan (MSP, Plan de service médical) ont été recueillies entre 2011 et 2021 auprès des chirurgiens généralistes travaillant dans les communautés du « Rural Subsidiary Agreement » (RSA). Les codes d'honoraires du MSP ont été organisés en procédures essentielles ou non essentielles, comme indiqué par le BCPD. Les APC ont été évalués et comparés aux procédures non essentielles.

Résultats: Entre 2011 et 2021, 223 103 procédures ont été réalisées dans des sites ruraux en Colombie-Britannique. En moyenne, 90,97% (écart-type = 20,78) des procédures effectuées dans toutes les communautés étaient des procédures de base du BCPD. Les soins chirurgicaux non essentiels les plus courants effectués par les chirurgiens généraux étaient la chirurgie plastique (n = 8035). Plus de 8% des procédures réalisées n'étaient pas des APC de chirurgie générale. Il est à noter qu'aucune des APC n'est considérée comme un privilège non essentiel et que toutes ont été réalisées en milieu rural.

Conclusion: Les chirurgiens généraux travaillant en milieu rural pratiquent de nombreuses procédures en dehors de l'APC, représentant plus de 8% de leur charge de travail et environ 6% des procédures pratiquées sont des privilèges non essentiels. Cela donne une idée des limites potentielles du BCPD pour les diplômés qui espèrent exercer dans les communautés rurales. Étant donné que le programme d'études CPC est réputé offrir une approche plus souple de l'apprentissage, il peut être adapté aux objectifs d'apprentissage et de carrière des résidents, notamment en leur permettant d'acquérir des compétences chirurgicales variées pour répondre aux besoins des zones rurales.

Motsclés: Chirurgie générale; compétences chirurgicales; chirurgie rurale; procédures de base en chirurgie générale; procédures non essentielles en chirurgie générale

INTRODUCTION

General surgery residency in Canada is a 5-year programme with the goal of training surgeons proficient in the management of a broad range of gastrointestinal, breast, endocrine, traumatic and soft-tissue illnesses. Competence by Design (CBD) is a model for resident assessment and promotion that was adopted by the Royal College of Physicians and Surgeons of Canada (RCPSC) in 2020. Residents are provided learning objectives called entrustable professional activities (EPAs) to be observed, evaluated and attained at distinct stages of training before progressing to the next phase.[1] These EPAs are based on the CanMEDS framework as well as core general surgery competencies.[1] Included in the definition for general surgery practice competencies by the RCPSC is the recognition that there is a diversity of healthcare environments general surgeons will work in.[1] Specifically, practice patterns depend on community location, resources, needs and access to other specialists, noting that rural or remote general surgeons practise a wide variety of procedures based on these factors.[2,3] Furthermore, general surgeons practising in rural and remote areas may also have to play a role in providing care outside of general surgery core competencies for these very same reasons.[3]

In British Columbia (BC), 38.2% of the population lives outside of urban areas (population <100,000).[4] In addition to this, an estimated 14.1% of general surgeons work in small communities with a population <50,000.[2] General surgeons working in these areas have been found to have a diverse practice including tendon repair, facial soft-tissue surgery, skin grafting, circumcision, hydrocelectomy, tubal ligation, caesarean section, ovarian cystectomy, varicose vein surgery, amputation and many more procedures that are not usually considered general surgery practices.[2]

The BC Privileging Dictionary (BCPD) was created in 2015 in response to the Cochrane Report (2011) to ensure adequate credentialing and patient safety.[5] It outlines core procedures that a recent general surgery graduate would reasonably be expected to perform as well as non-core procedures, in which further training, experience or skill must be demonstrated before these privileges are granted.[5] Many of these

non-core procedures are the aforementioned procedures performed by general surgeons working outside of urban centres. For general surgery graduates hoping to enter rural practice in BC, this may pose an added challenge of obtaining extra training as well as maintaining the skills needed to support the communities that they serve.

The University of BC is the only RCPSC general surgery training programme in BC, allowing residents the opportunity to train at 26 sites throughout the province; 7 of these are defined as rural locations.[6] The goal of this study is to better understand which procedures that fall outside of general surgery EPAs are being performed by BC rural general surgeons. With this, we are also hoping to evaluate which procedures historically being done in rural settings may have been affected by the BCPD. By doing so, we hope to better inform training programmes about preparing residents for rural practice in BC as well as understand what further competencies general surgeons should attain before entering practice in rural and remote communities.

METHODS

Data collection

The Rural Practice Subsidiary Agreement (RSA) has defined rural communities in BC; these were selected for data collection. The Rural Practice Subsidiary Agreement is a collaboration between BC Government, Doctors of BC and the Medical Services Commission of BC to address the unique considerations of providing healthcare to rural communities. Data demonstrating what procedures rural general surgeons perform were obtained through the BC Ministry of Health Medical Service Plan (MSP) fee-for-service billing codes through the BC Ministry of Health. These data are publicly available by request and no identifiable patient or provider information was included; therefore, no ethics approval was required. Our data request included surgical procedures billed to MSP by general surgeons in rural communities between 2011 and 2021, organised by the community. Communities that are no longer considered rural by the RSA (Kamloops, Chilliwack and Western Communities) were excluded from the study.

EPA data were collected from the RCPSC website (https://www.royalcollege.ca/content/dam/documents/ibd/general-surgery/epa-guide-general-surgery-e.pdf) to define the core competencies that residents must demonstrate and attain before the completion of residency. Within each EPA group (e.g., C6: performing procedures on the small bowel), the subheadings for specific procedures were defined (e.g., lysis of adhesions, resection and anastomosis, stoma creation, stoma closure, feeding jejunostomy insertion and repair of enterotomy).

The BCPD definitions of core and non-core procedures were extracted from their website.[7] These were listed and compared against the EPAs as well as the MSP procedures for rural general surgeons.

Data stratification

Communities were grouped by alphabetic categorisation defined by the RSA. These categories are designated A, B, C or D depending on the number of designated specialities within 70 km, the number of general practitioners within 35 km, community size, distance from a major medical community, degree of latitude, specialist centre and location arc.[8]

The MSP fee codes from the RSA communities were organised into categories of abdominal, breast, skin and soft tissue, orthopaedic, obstetric/gynaecologic, neurosurgical, vascular, urologic, plastic, head and neck and thoracic surgeries as well as endoscopy and pacemaker/port insertion. Subcategories were then created for each heading. EPA subheadings were then correlated to the BCPD core and non-core competencies to look for correlation or discordance.

Statistical analysis

We looked at the total number of cases outside of the EPAs that are being done in each rural community annually. The same was done for core and non-core procedures. Welch's *t*-tests were used to determine if the proportion of non-core surgery cases significantly changed after the implementation of the BCPD in 2015. Welch's *t*-tests were also used for assessing if the proportion of non-EPA cases significantly changed after the adoption of the BCPD. Furthermore, we used

a Mann–Whitney *U*-test to determine if there was a correlation between a community's RSA alphabetic designation and the proportion of non-core cases that were performed. Finally, a Mann–Whitney *U*-test was also used to determine if there was a correlation between the RSA rurality classification and the proportion of non-EPA procedures performed in these communities.

RESULTS

In this retrospective observational study, there were a total of 223,103 cases included from 2011 to 2021. There were 23 rural communities included in this study, from the Northern Health Authority, Interior Health Authority, Island Health Authority and Vancouver Coastal Health Authority [Figure 1].

Entrustable professional activities

Of the total number of procedures done, 203,949 (91.41%) had associated EPAs, whereas 19,154 (8.59%) were non-EPA procedures. The most common EPA procedures were colonoscopy (*n* = 80,453, 36.06%), colorectal (*n* = 23,696, 10.62%), hernia (*n* = 20,890, 9.36%), wound management (*n* = 17,966, 8.05%) and breast (*n* = 9,801, 4.39%) [Table 1].

The most common non-EPA procedures were plastic surgery (*n* = 8035, 3.60%), vascular surgery (*n* = 3,389, 1.52%), minor urology procedures (*n* = 1,835, 0.82%) and Endoscopic retrograde cholangiopancreatography (ERCP) (*n* = 1,502, 0.67%) [Table 2].

Of the BCPD core privileges, temporal artery biopsies, as well as varicose vein ligation and management of venous stasis disease are not listed as EPAs [Table 3]. Of the non-core privileges, none of them are EPAs for general surgeons [Table 4].

British Columbia Privileging Dictionary

Based on the BCPD definitions, 202,969 cases (90.98%) performed by BC rural general surgeons were considered to be core procedures, whereas 14,525 (6.51%) were non-core procedures. In the past decade, 5,609 (2.51%) of the procedures performed by BC rural general surgeons were not listed in the BCPD. The most common core procedures performed were similar to the most common procedures associated with an EPA, as shown in Table 1. Table 5 outlines all core procedures performed by BC rural general surgeons.

The total number of procedures done that are not considered core procedures (i.e., 'non-core' and 'not listed' procedures) was 20,134 procedures (9.02%). The most common non-core procedures performed were plastic surgery (*n* = 8035, 39.91%), minor urology procedures (*n* = 1,835, 9.11%), ERCP (*n* = 1,502, 7.46%) and head and neck (*n* = 1,076, 5.34%) [Table 6]. The procedures that were not listed in the BCPD but were performed by BC rural general surgeons include vascular surgery (*n* = 3,747, 18.61%), orthopaedic

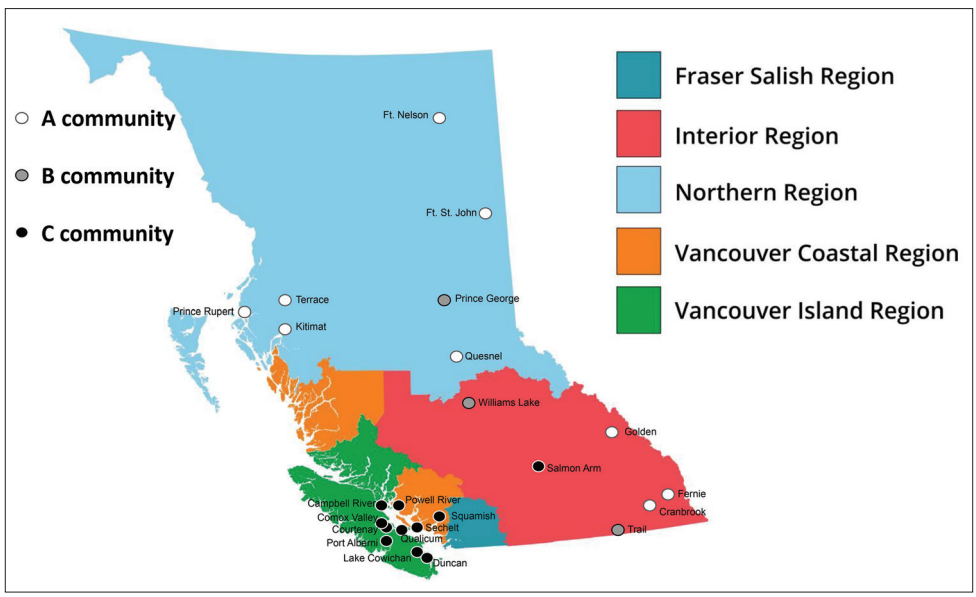


Figure 1: RSA rural community distribution throughout British Columbia.

Table 1: Procedures performed by British Columbia rural general surgeons that are associated with an entrustable professional activity (*n*=203,949)

Surgical procedure	Sub-category	Total (2011–2021), *n* (%)
Scopes	Endoscopy	7349 (3.60)
	Colonoscopy	80,453 (39.45)
Abdomen	Colorectal	23,696 (11.62)
	Appendix	6374 (3.12)
	Small bowel	1573 (0.77)
	Gall bladder	13,014 (6.38)
	HPB	522 (0.26)
	Upper GI	3449 (1.69)
	Hernia	20,890 (10.25)
	Trauma	342 (0.17)
	Surgical oncology	2541 (1.25)
	Complications	2491 (1.22)
Breast		9801 (4.81)
Skin/soft tissue	Biopsies	3210 (1.57)
	Wound management	17,966 (8.81)
	Tumour/carcinoma	3539 (1.73)
	Nails	1685 (0.83)
Ports		3444 (1.69)
Head and neck		742 (0.36)
Thoracics		510 (0.25)
Vascular		358 (0.17)
Total		203,949 (100)

HPB: Hepato-pancreato-biliary surgery, GI: Gastroenterology

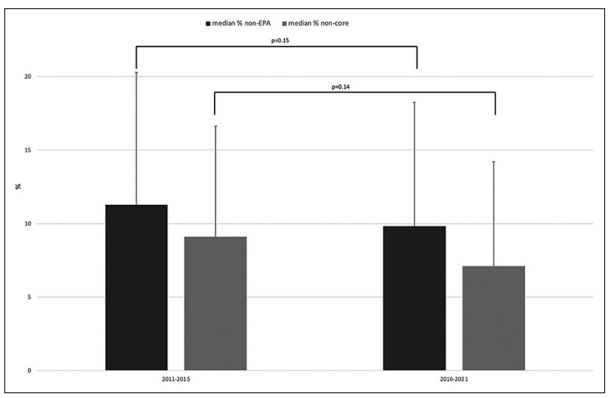


Figure 2: Proportion of non-core and non-entrustable professional activity procedures before and after British Columbia privileging dictionary implementation. EPA: Entrustable professional activity.

surgery (*n* = 1,686, 8.37%), major urology procedures (*n* = 99, 0.49%), neurosurgery (*n* = 63, 0.31%) and thoracic surgery (*n* = 14, 0.07%) [Table 7].

Before the establishment of the BCPD in 2015, 8.2% of the procedures done by BC rural surgeons were non-core. After 2015, this changed to 5.45%.

Table 2: Procedures performed by British Columbia rural general surgeons without an associated entrustable professional activities (*n*=19,154)

Surgical procedure	Sub-category	Total (2011–2021), *n* (%)
Abdomen	Colorectal	259 (1.35)
	HPB	37 (0.19)
	Surgical oncology	24 (0.13)
	Upper GI	75 (0.39)
Thoracics		23 (0.12)
Paediatrics		15 (0.08)
Urology	Major procedures	99 (0.52)
	Minor procedures	1835 (9.58)
Orthopaedics	Amputations	500 (2.61)
	Soft tissue	216 (1.13)
	Bones	208 (1.08)
	Injections	762 (3.98)
Obstetrics/ gynecology	Obstetrics	653 (3.41)
	Gynecology	391 (2.04)
Plastics		8035 (41.95)
Scopes	ERCP	1502 (7.84)
Head and neck		335 (1.75)
Neurosurgery		63 (0.33)
Vascular		3389 (17.69)
Pacemakers		733 (3.83)
Total		19,154 (100)

HPB: Hepato-pancreato-biliary surgery, GI: Gastroenterology, ERCP: Endoscopic retrograde cholangiopancreatography

There was no significant change in the proportion of non-core cases performed before and after establishing the BCPD (*P* = 0.14). When looking at the change in the proportion of EPA-related procedures performed before and after BCPD implementation, there were 10.58% non-EPA cases performed versus 6.96% performed after 2015 (*P* = 0.15) [Figure 2].

With stratification by RSA rurality categorisation, there was no significant difference between the proportion of core versus non-core procedures performed in A, B and C communities (*P* = 0.08). A similar result was also noted when looking at the proportion of EPA procedures performed in RSA A, B and C communities (*P* = 0.09) [Figure 3].

DISCUSSION

In this retrospective observational study, we found that rural general surgeons perform a variety of procedures both within and outside of the classic scope of general surgery. In RSA communities, 20,152 non-conventional general

Table 3: Entrustable professional activities versus core British Columbia Privileging Dictionary procedures

Core privileges	Requirement to request for privileges	EPA?
Head and neck		
Management of benign neck lesions to include biopsy and excision		Performing procedures on the skin and soft tissue
Surgical airway management		Performing procedures for patients with traumatic injuries
	Surgical management of thyroid disease to include cancer	Performing procedures for patients with disorders of the thyroid and/or parathyroid
	Surgical management of parathyroid disease	Performing procedures for patients with disorders of the thyroid and/or parathyroid
Lymph node biopsy		Performing procedures on the lymph nodes
Breast and lymphatics		
Surgical management of benign breast disease		Performing procedures on the breast
Surgical management of breast cancer		Performing procedures on the breast
Sentinel node biopsy		Performing procedures on the lymph nodes
Axillary lymph node dissection		Performing procedures on the lymph nodes
Chest		
	Management of diaphragmatic hernia, excluding children under the age of 24 months	Performing procedures for patients with traumatic injuries
Tube thoracostomy		Performing procedures for patients with traumatic injuries
Abdomen and retroperitoneum		
Upper GI tract		
Surgical management of benign gastro-duodenal disease	Upper GI endoscopy - diagnostic	Performing procedures on the stomach and duodenum
		Performing esophagogastroduodenoscopy
	Upper GI endoscopy - therapeutic - endoscopic management of upper GI bleeding	Performing esophagogastroduodenoscopy
	Antireflux surgery	Performing procedures on the stomach and duodenum
	Surgical management of benign esophageal disease	Performing procedures on the stomach and duodenum
	Hiatal hernia	Performing procedures on the stomach and duodenum
Hepatopancreaticobiliary		
Surgical management of benign biliary disease	Common bile duct exploration	Performing procedures on the hepatobiliary system
Surgical management of distal pancreatic disease		Performing procedures on the pancreas
Liver biopsies, non-segmental liver resections		Performing procedures on the hepatobiliary system
Lower GI (small and large bowel)		
Surgical management of benign and malignant disease		Performing procedures on the small bowel, performing procedures on the appendix and colon
Diagnostic endoscopy		Performing colonoscopies
Therapeutic endoscopy		Performing colonoscopies
Surgical management of splenic disease		Performing procedures on the spleen
Abdominal wall		
Surgical management of groin hernia		Performing procedures on the abdominal wall and hernia

Contd...

Table 3: Contd...

Core privileges	Requirement to request for privileges	EPA?
Surgical management of ventral hernia		Performing procedures on the abdominal wall and hernia
Complex abdominal wall reconstruction		Performing procedures on the abdominal wall and hernia
Pelvis		
Surgical management of benign anal disease		Performing procedures on the appendix and colon
Surgical management of benign rectal disease		Performing procedures on the appendix and colon
Surgical management of malignant rectal disease		Performing procedures on the appendix and colon
Extremities and soft tissue		
Surgical management of benign and malignant skin conditions		Performing procedures on the skin and soft tissue
Surgical management of benign soft tissue conditions		Performing procedures on the skin and soft tissue
	Surgical management of malignant soft tissue masses	Performing procedures on the skin and soft tissue
Vascular		
Vascular access procedures		Performing procedures for patients with traumatic injuries
Temporal artery biopsy	Varicose vein ligation and management of venous stasis disease	
Paediatric surgery		
Appendectomy in children		Performing procedures on the appendix and colon
Umbilical or epigastric hernia repair in children		Performing procedures on the abdominal wall and hernia
Inguinal hernia repair in children		Performing procedures on the abdominal wall and hernia
Laparotomy for acute abdomen in children		Performing procedures for patients with traumatic injuries
Laparotomy for intestinal obstruction in children		Performing procedures on the small bowel
Lymph node biopsy for suspected infection of lymphoma		Performing procedures on the lymph nodes
Incision and drainage of superficial abscesses		Performing procedures on the skin and soft tissue
Excision of benign lesions of the skin and subcutaneous tissue		Performing procedures on the skin and soft tissue
Pilonidal disease		Performing procedures on the appendix and colon
Pyloromyotomy for pyloric stenosis		Performing procedures on the stomach and duodenum
Urology		
Cystotomy repair-minimally invasive procedure		
Cystotomy repair		
Hydrocele repair		
Orchidectomy		
Vasectomy		
Plastic surgery		
Flaps for skin closure -advancement/ Z-plasty		

EPA: Entrustable professional activities, GI: Gastroenterology

Table 4: Entrustable professional activities versus non-core British Columbia Privileging Dictionary procedures	
Non-core privileges	EPA?
Paediatric surgery	
Complex paediatric surgery under 2 years of age	-
Head and neck	
Surgical management of aerodigestive tract malignancies	-
Surgical management of salivary gland disease	-
Regional lymph node dissection	-
Adenotonsillectomy	-
Esophageal	
Esophagectomy and other surgical management of malignant esophageal disease	-
Heller myotomy	-
Zenker's diverticulum	-
Advanced endoscopy	
Endoscopic US	-
ERCP	-
Placement of digestive tract stents	-
Hepatopancreaticobiliary	
Surgical management of malignant biliary disease	-
Surgical management of proximal pancreatic disease	-
Liver resection, segmental or greater	-
Colorectal	
Complex anal vaginal/rectovaginal fistula repair	-
Surgical management of fecal incontinence	-
Transanal endoscopic microsurgery for high rectal lesions	-
Transanal total meso-rectal excision	-
Pelvic pouch surgery	-
Surgical management of adrenal disease	-
Plastic surgery	
Carpal tunnel release/dupuytren's contracture/trigger finger/ganglia	-
Tendon repair	-
Full thickness skin grafts	-
Obstetrics and gynecology	
Laparoscopic procedures: ovarian cystectomy/salpingo-oophorectomy/sterilisation/management of ectopic pregnancy	-
Total abdominal hysterectomy: Ovarian cystectomy/salpingo-oophorectomy	-
Dilation and curettage	-
Caesarean section	-
Management of ectopic pregnancy - open gynaecologic procedures	-
Management of post-partum haemorrhage/manual remove of placenta	-
Evacuation of the pregnant uterus: Dilation and curettage up to 14 weeks in size	-
Repair of perineal and vaginal tears (including 3–4th degree tears and cervical lacerations)	-
Drainage and marsupialisation of bartholin's gland abscess	-
Paracervical block and pudendal block	-
Pacemakers	
Pacemaker generator replacement	-
Pacemaker revision	-
Pacemaker replacement	-
Pacemaker implantation	-
Complex multidisciplinary surgery	
Specific paediatric procedures	-
Complex surgery oncology	-
Bariatric	-
Organ transplantation	-

EPA: Entrustable professional activities, ERCP: Endoscopic retrograde cholangiopancreatography , US: Ultrasound

Table 5: Core procedures performed by British Columbia rural general surgeons according to the British Columbia Privileging Dictionary (*n*=202,969)

Surgical procedure	Sub-category	Total (2011–2021), *n* (%)
Scopes	Endoscopy	7349 (3.62)
	Colonoscopy	80,453 (39.64)
Abdomen	Colorectal	23,732 (11.69)
	Appendix	6374 (3.14)
	Small bowel	1573 (0.77)
	Gallbladder	13,014 (6.41)
	HPB	498 (0.24)
	Upper GI	3524 (1.74)
	Hernia	20,890 (10.29)
	Trauma	342 (0.17)
	Surgical oncology	2565 (1.26)
	Complications	2491 (1.23)
Breast	-	9801 (4.83)
Thoracics		519 (0.25)
Ports		3444 (1.70)
Skin/soft tissue	Wound management	17,966 (8.85)
	Biopsies	3210 (1.58)
	Tumour/carcinoma	3539 (1.74)
	Nails	1685 (0.83)
Total		202,969 (100)

HPB: Hepato-pancreato-biliary surgery, GI: Gastroenterology

Table 6: Non-core procedures performed by British Columbia rural general surgeons according to the British Columbia Privileging Dictionary

Surgical procedure	Sub-category	Total, *n* (%)
Abdomen	Colorectal	223 (1.11)
	HPB	61 (0.30)
Paediatrics		14 (0.07)
Thoracics		2 (0.01)
Urology	Minor procedures	1835 (9.11)
Obstetrics/ gynaecology	Obstetrics	653 (3.24)
	Gynecology	391 (1.94)
Plastics		8035 (39.91)
Scopes	ERCP	1502 (7.466)
Head and neck		1076 (5.34)
Pacemakers		733 (3.64)
Total		14,525 (72.14)

Total procedures not considered "core" procedures, *n*=20,134. ERCP: Endoscopic retrograde cholangiopancreatography, HPB: Hepato-pancreato-biliary surgery

surgery procedures were performed. Of these plastic, vascular and urology surgeries were the most common. Similar findings have been noted from other Canadian studies.[3] Rural opportunities in general surgery residency have been recognised as a valuable training experience.[9] Similar to our results, expertise in endoscopy, advanced

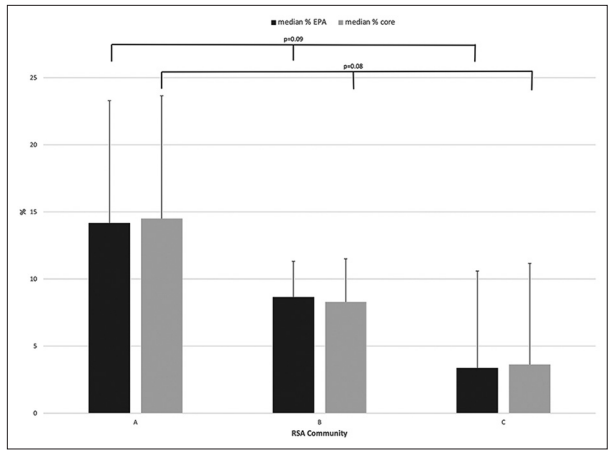


Figure 3: Proportion of non-core and non-entrustable professional activity procedures stratified by RSA classification. EPA: Entrustable professional activity.

laparoscopy and trauma as well as classically non-general surgery procedures including C-section, carpal tunnel release and amputations have been valuable skills to have before entering rural practice.[9]

After the adoption of the BCPD in 2015, there was no significant change in the proportion of non-core general surgery procedures performed in rural communities. This was also true for the proportion of non-EPA procedures performed. Although privileging is important for patient safety, it has been controversial as it may limit access to care for patients in rural and remote communities. In a 2018 survey of BC's rural physicians, half of the respondents stated that the BCPD negatively impacted the quality of care they could provide.[10] Furthermore, for some doctors, it created a barrier to care for patients, as obtaining and maintaining privileges could be challenging. Specific to surgical care, not only does the surgeon have to either have enhanced training or prove competence for certain privileges, but there also needs to be sufficient allied healthcare support available. For example, for paediatric surgeries, there needs to be appropriate anaesthetic and post-operative care. Furthermore, to perform more complex surgeries, including oncologic and transplant, significant infrastructures must be in place. With this said, a surgeon's scope is not only dictated by their level of training but also that of their colleagues and health care infrastructures.

The CBD curriculum provides residents the opportunity, if motivated and able, to complete residency in an accelerated fashion if EPAs are

Table 7: Procedures performed by British Columbia rural general surgeons that were not listed in the British Columbia Privileging Dictionary

Surgical procedures	Sub-category	Total, *n* (%)
Thoracics		14 (0.069)
Orthopaedics	Amputations	500 (2.48)
	Soft tissue	216 (1.07)
	Bones	208 (1.033)
	Injections	762 (3.78)
Urology	Major procedures	99 (0.49)
Vascular		3747 (18.61)
Neurosurgery		63 (0.31)
Total		5609 (27.86)

Total procedures not considered "core" procedures, *n*=20,134

met before the next promotional period.[11] For example, at the University of Toronto, CBD was first launched for orthopaedic residents and was found to reduce the length of training for most residents.[12] In a survey of Canadian general surgery chief residents, <½ of those interested in entering community practice felt that they were prepared to perform non-general surgery procedures.[13] This sentiment is also reflected in current BC Surgeons' assessments of recent graduates hoping to enter rural practice.[2] Therefore, for residents interested in rural practice, rearranging blocks in subspecialty general surgery rotations once competence has been achieved may allow these residents to complete off-service blocks to enhance skills in other surgical specialities.

The CBD curriculum, as it defines what general surgery residents must be able to perform independently before entering practice, has a pivotal role in maintaining a broad skill set for general surgeons. The standards for general surgery training and competence are set nationally and, therefore, may not address differences in health care delivery across the country. The scope of general surgery nationally is heterogeneous from academic centres with subspecialist focus to remote surgeons without immediate access to other surgical specialists. The scope of general surgery remains in constant flux with relatively new Royal College specialities, such as vascular surgery and training pathways, such as thoracic surgery, as they evolve. A proportion of those entering community practice ultimately end up in a rural location. With the majority of residency exposure focused in academic centres, these training sites often have a significant influence on what future general surgeons are trained to do.

As UBC currently has mandatory community rotations for their general surgery residents, other programmes have dedicated rural tracks with formal training rotations in non-general surgery specialities (obstetrics and gynaecology, orthopaedics, urology and ear, nose and throat).[3,14-16] Residents graduating from these programmes have increased confidence with non-general surgery procedures but also are more likely to pursue a career in rural practice once completed.[17-21] For example, a rural residency training programme at the Oregon Health and Science University places residents in a rural setting for 1-year, which has increased the likelihood that they will practise general surgery in a similar setting despite initial specialty plans.[17] Exposure to rural general surgical practice and communities allows residents to potentially picture themselves fitting within these positions.

Rural fellowship programmes have been proposed or created to prepare surgeons for rural and broad-based practice.[22] With the BCPD, these programmes may be of benefit in BC's circumstances where formal training in non-core general surgery procedures may be obtained to meet community needs. Despite this, it has been a controversial topic as recruitment and retention in rural locations can be challenging and added training creates further barriers to filling these positions.[23,24] Mentorship programmes have been found to be successful for increasing interest in rural surgery as well as for skill acquisition.[22,25,26] In BC, mentorship may be obtained through mentorship opportunities at tertiary centres, the reticulum general surgery website, tele-mentoring, rounds and skill enhancement courses.[2] In a retrospective observational study, Ma noted that most rural general surgeons graduated from medical school before 1998 and that there is a current trend of more Canadian Medical Graduates entering rural surgical practice.[27] Mentorship, combined with orchestrated succession plans, may benefit residents who are interested in rural practice to not only familiarise them with the position but also with the skills required to perform in their future position.

The importance of training general surgery graduates who are willing and keen to practise

in rural areas of BC cannot be over-emphasised. A recent study characterised rural general surgery in BC and Canada, which showed that the average year of medical school graduation for rural general surgeons in BC is 1997 (±12.7 years).[27] This implies that a significant proportion of rural general surgeons will be considering retirement within the next 10–15 years. In fact, the authors used a 10-year workforce prediction model that showed approximately 43% of new general surgeons would need to enter rural practice each year to meet the demand created by retiring surgeons, assuming an average career length of 36 years.[27]

There are many limitations to this project. As the COVID-19 pandemic changed the practice patterns of general surgery in 2020 and 2021 to accommodate resource allocation, there was a decrease in the number of elective surgeries that could be performed. This may have changed what and how many procedures rural general surgeons were performing. Furthermore, BC's rural geopolitical, social and healthcare landscape is distinct, including the definition of a rural community as well as the unique BCPD. Therefore, these results may not be generalisable to other centres. Patient outcomes of the non-conventional procedures performed were beyond the scope of our study, but previous literature has shown that patients, despite knowing poorer outcomes in smaller centres, prefer having their surgical care closer to home.[28]

CONCLUSION

Rural general surgeons in BC work in unique situations where they are required to perform procedures outside of the conventional practice of a general surgeon to address community needs. Over a 10-year period, we found that 9.03% of procedures performed were non-core procedures as defined by the BCPD. This shows a potential limitation to the BCPD, particularly when it is so critical that these services remain available to under-served communities. The CBD curriculum provides a more flexible residency programme that could be utilised to better prepare new graduates for practice in rural locations. Future endeavours could look at evaluating where there is room for change in the general surgery training curriculum to adequately train rural general surgeons with a focus on ensuring patient safety and continuing to provide a wide variety of care to these rural communities in BC.

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Open Call for Abstracts - Rural & Remote 2025

Rural & Remote 2025 will take place in Winnipeg, MB, April 24-26, 2025, and the Planning Committee is accepting abstracts.

The committee is considering abstracts for two types of presentations related to any aspect of health and healthcare in a rural and remote setting:

Session Lectures (Breakout sessions)
Hands-on Workshops (Small group learning)

These sessions should focus on clinical skills and knowledge development related to rural practice. Sessions / Workshops will be 60 minutes in duration and should be interactive and engaging. (The schedule is built in 60-minute time slots, 2-hour sessions are welcome.)

All abstract submissions will undergo peer review by the Rural & Remote Planning Committee.

Deadline: Extended

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