

Original Article

Resident Survey on Gastroenterology Training in Canada

Brian P.H. Chan, MD, FRCPC¹, Michael Fine, MD, FRCPC¹, Seth Shaffer, MD, FRCPC²,
Khurram J. Khan, MS, MD, FRCPC¹

¹Division of Gastroenterology, Department of Medicine, McMaster University, Hamilton, Ontario, Canada; ²Section of Gastroenterology, Department of Medicine, University of Manitoba, Winnipeg, Manitoba, Canada

Correspondence: Khurram J. Khan, Division of Gastroenterology, Department of Medicine, St. Joseph's Healthcare, 50 Charlton Avenue East, Martha Wing, Room H421, Hamilton, Ontario L8N 4A6, e-mail: khankj@mcmaster.ca.

ABSTRACT

Background: Gastroenterology training in Canada is guided by the Royal College of Physicians and Surgeons of Canada. Resident perspectives on training and the degree of heterogeneity across training programs have not been previously surveyed.

Aim: This study aims to evaluate the current Canadian adult gastroenterology training experience from a resident perspective and provide insight into the heterogeneity among training programs.

Method: A survey designed by three current gastroenterology residents was distributed to trainees attending the Gastroenterology Residents-in-Training course at Canadian Digestive Diseases Week 2018. Categorical data from the survey was analyzed in table format. Other continuous data was converted to dichotomous data and analyzed in groups of small and large programs, the large program defined as greater than six trainees.

Results: The overall response rate was 45 of 56 (80%), representing 13 of 14 accredited training sites. Mandatory rotations and core procedures varied widely across respondents, with only inpatient training consistent across all sites. Small programs had a higher call burden ($P=0.039$), but staff were more likely to be available to cover call if the resident coverage was unavailable ($P=0.002$). There were nonsignificant trends in small programs in the inability to take a post-call day ($P=0.07$) and a resident perception of being well trained ($P=0.07$).

Conclusions: There is heterogeneity across programs in mandatory rotations and core procedures. With the upcoming shift to competency-based medical education, it is an opportune time to re-evaluate and perhaps standardize how gastroenterology training is delivered in Canada.

Keywords: *Medical education; curriculum; residency; fellowship; gastroenterology.*

INTRODUCTION

There are 14 accredited adult gastroenterology (GI) training programs in Canada. Training standards and objectives are governed by the Royal College of Physicians and Surgeons of Canada (RCPSC), which also administers certification examinations. The RCPSC has a multiyear plan to transition all specialties to Competency-Based Medical Education (CBME) with a Competency by Design (CBD) model. Each training program determines how objectives are achieved.

Previous studies in GI training have all primarily focused on breadth and volume of exposure in endoscopy (1–4). Evaluation of endoscopy training in Canada was reported in 2013 (3), but limited other information regarding training was assessed. A survey of European GI training assessed by trainees found major differences in duration of training, workload, call burden, and endoscopic procedures between and within countries (1). In 2011, revised duty hour reforms (DHR) were implemented by the Accreditation Council for Graduate Medical Education (ACGME) in the United States. Meta-analysis has shown that

DHR improves resident well-being, although effects on education and patient safety remain unclear (5). In Canada, similar DHR have not been implemented widely; however, they remain an active area of discussion.

Significant changes are forthcoming in the Canadian medical education landscape. Gastroenterology training has not previously been evaluated regarding work load, duty hours, program size or subspecialty exposure on the effects and satisfaction of training. These factors are all increasingly important with the upcoming transition to CBME. The current study aims to evaluate the Canadian GI training experience from a resident perspective using surveys and provide insight into the heterogeneity among training programs.

METHODS

Survey Design and Development

The survey was developed by three current GI residents. The list of survey questions was developed in an iterative fashion, and the final survey had agreement among all authors. To improve the likelihood of response rate, the survey was limited to 35 questions, designed to be completed in five minutes. The survey was tested in a pilot study, which was distributed to all current GI Chief Residents in Canada (6). No questions were added to the pilot study, but several were removed, which focused on community staff involvement, accommodations for the Internal Medicine RCPSC exam and the burden of academic activity outside of clinical duties.

Survey sections included program demographics, program structure, on-call responsibilities, subspecialty procedures, academic activities and a global assessment. Questions were presented as multiple choice ordinal responses or a five-point Likert scale. All responses were anonymized. The survey instrument is available in the [Appendix](#).

Study Recruitment

The survey was distributed at the Gastroenterology Residents-in-Training course (GRIT) at Canadian Digestive Diseases Week (CDDW) 2018. Sixty-seven residents attended GRIT: 56 adult GI and 11 pediatric GI. Surveys were distributed to all participants, and any pediatric responses were discarded. No remuneration was provided for completing the survey. Responses were collected at GRIT. For participants who failed to return the survey, multiple attempts via personal contact were made to collect results until the end of CDDW (72 hours post-GRIT), which was the end of the survey collection period.

Statistical Analysis

Responses were collected from the surveys and entered in a Microsoft Excel sheet (Microsoft Corporation, Redmond, Washington). The data was categorized by the program to which the residents belonged, to ensure that we had a reasonable

sample from all programs. Within each program, it was understood that each resident could have a unique experience, and this variability would be reflected if multiple responses per school were obtained.

Categorical data from the survey was analyzed in table format based on program grouping. Data was presented in aggregate to protect respondents and programs from identification, given the small population of GI training in Canada. All the continuous data was converted to dichotomous data, given the small numbers in the survey for statistical analysis purposes. The midpoint was the cut-point for converting the ordinal data to dichotomous. For the questions with a five-point Likert scale, the data was dichotomized with “agree” and “strongly agree” taken as positive, and “neutral”, “disagree” and “strongly disagree” taken as negative. After considering options to analyze and interpret our data, a post hoc decision was made to look at program size and identify if this was associated with on-call burden and perception of program satisfaction.

Using IBM SPSS statistics version 20 (Armonk, NY), a Chi-square test was employed to compare programs with less than six residents to programs with six or more residents. A Fisher exact test was used if any value in the Chi-square was less than or equal to five. A two-sided significance of 0.05 was used to assess statistical significance. Further testing for correlation of variables was not performed.

RESULTS

There were 56 adult GI residents at GRIT, and we received 45 completed responses, for an 80% response rate. Thirteen training programs were represented, and one school in Quebec was not represented from the surveys collected.

Program Demographics

Nine programs had less than or equal to six trainees (n=28), while four programs had greater than six trainees (n=17) across both core years of training. This included both Canadian Medical Graduates and International Medical Graduates. Seven programs had less than or equal to two hospital sites, while six had greater than two sites. Gastroenterology was an admitting service at 10 programs, although the number of admitted patients had wide intra-rater variability. The mean number of gastroenterology and hepatology academic staff per program was 25 (range 7–60), corresponding to an average of four academic staff to each resident (range 2–10).

Program Structure

Mandatory rotations varied widely across respondents, with only inpatient service being constant across all programs ([Figure 1](#)). Outside of esophagogastroduodenoscopy and colonoscopy, procedures also varied widely across respondents, with percutaneous gastrostomy tube placement being the most

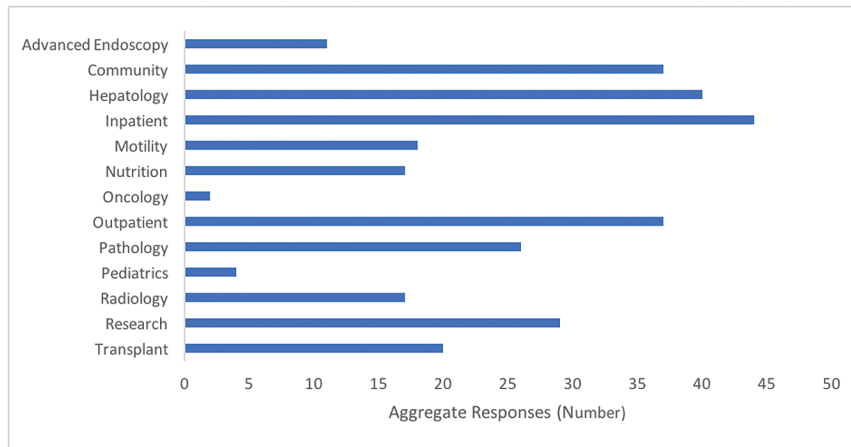


Figure 1. Mandatory rotations across Canadian gastroenterology training.

common (Figure 2). Endoscopic retrograde cholangiopancreatography (ERCP; three programs) and endoscopic ultrasound (EUS; one program) remain sparsely offered as part of core training. All programs provided financial support to attend academic conferences. Seven programs provided greater than \$1500, while six provided less than or equal to \$1500 in conference funding.

Program Size and Call Burden

Programs were grouped into large (greater than six trainees) and small (six trainees or fewer) for the purposes of statistical analysis and comparison (Table 1). Using a call volume of greater than or equal to six calls per month, residents in smaller programs had a statistically significant higher call volume ($P=0.039$). Compared to large programs, smaller programs had staff coverage available as first call, if residents were not available to cover call ($P=0.002$). There was a trend in smaller programs that residents perceived they were unable to take a post-call day if required, although this was not statistically significant ($P=0.07$). There was no statistical difference between groups in frequency of call-backs to hospital ($P=0.28$), call-backs to hospital after 10 pm ($P=0.99$) and the amount of sleep achieved while on call ($P=0.72$).

Program Size and Satisfaction

There were no significant differences between program size and satisfaction (Table 1). There was a trend towards a resident perception of being well-trained at the end of the training period in smaller programs ($P=0.07$). Otherwise, there was no statistical difference in staff support ($P=0.14$), career counselling ($P=0.35$) or program satisfaction ($P=0.45$) between large and small programs.

DISCUSSION

We present the first study to look at the Canadian GI training experience from a trainee perspective. There was a wide range of number of core trainees across the two years of training; the

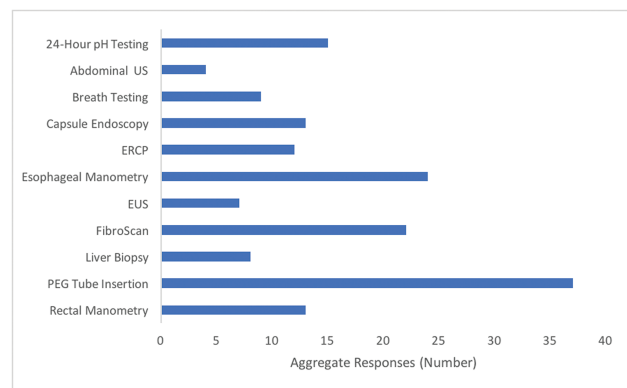


Figure 2. Training in subspecialty procedures received during mandatory rotations across Canadian gastroenterology training. US, ultrasound; ERCP, endoscopic retrograde cholangiopancreatography; EUS, endoscopic ultrasound; PEG, percutaneous endoscopic gastrostomy.

majority of programs had six or fewer residents, with a median of six. In ACGME-accredited programs, there is an average of 9.2, but training in the United States is three years, making the number of trainees per year similar (4). The mean ratio of four academic staff per resident is much higher than the reported ratio in Europe, at 4:3 (1). Faculty to student ratio is widely used in higher education but has not been studied in relation to resident outcomes. However, full-time equivalent paid faculty to position ratio (FTP) has been correlated with improved success at licensing examinations in pediatrics and internal medicine (7, 8). The FTP is preferred over resident to faculty ratio, as a small program may be at a disadvantage using this measure alone, but this was not evaluated in our survey.

Smaller programs were found to have a higher call burden but more staff support for call if residents were unavailable to do call. This is intuitive as fewer trainees available to support the GI service may result in a higher workload. Call is an inevitable aspect of the practice of medicine but a high-call burden has been a noted deterrent to recruitment (9). There was also a trend towards residents in smaller programs perceiving they would be well-trained at the end of their training. Medical

Table 1. Comparison of survey results between small and large programs on call burden and program satisfaction

Survey Question	Small Programs % (n)	Large Programs % (n)	P value
Call volume greater than or equal to six shifts per month.	92.9 (26)	64.7 (11)	0.039
Call backs to hospital more than 50% of shifts.	17.9 (5)	35.3 (6)	0.28
Call backs to hospital after 10 pm, more than 50% of shifts.	10.7 (3)	11.8 (2)	0.99
Do staff cover as first call if residents are not available?	71.4 (20)	23.5 (4)	0.002
Greater than or equal to six hours of sleep while on call.	21.4 (6)	29.4 (5)	0.72
*Ability to take post-call days.	21.4 (6)	47.1 (8)	0.07
*Staff support while on call.	96.4 (27)	82.4 (14)	0.14
*Adequate career counselling.	46.4 (13)	29.4 (5)	0.35
*Overall program satisfaction.	85.7 (24)	76.5 (13)	0.45
*Belief of being well trained at the completion of residency.	85.7 (24)	58.8 (10)	0.07

*Denotes a five-point Likert scale question. For analysis, this data was dichotomized with “strongly agree”, and “agree”, taken as positive, and “neutral”, “disagree”, and “strongly disagree”, taken as negative.

education requires patient exposure and heterogeneity of cases, which a higher workload may provide. However, it has also been shown that an overemphasis on clinical service comes at the expense of educational opportunities and may be detrimental to overall learning (10–13). In GI, this is of even greater concern, as procedural skills must also be developed.

Service to education ratio has been widely discussed as it pertains to resident work hours. In 2003 and 2011, the ACGME put in place regulations to limit the work week to 80 hours for all trainees, inclusive of call and moonlighting, and maximum 16-hour shifts for first year residents. Similarly in 2012, Quebec instituted a maximum 16-hour duty schedule for in-house calls (14). The merit of this policy continues to be debated in the literature. Post-DHR studies have shown improvement (15, 16), no change (17), and worse performance (18) in certification and in-training examination scores but an improvement in resident well-being (5). There are no GI specific studies, but procedural specialties have favoured DHR significantly less than internal medicine (19). In addition, residents at advanced stages of training favoured DHR less than their junior counterparts (20). These findings are not entirely applicable to the Canadian GI training experience but do speak to a need to balance service requirements and clinical training opportunities. The transition to CBD provides an ideal juncture to re-examine our approach to training, service requirements, skill acquisition, and resident well-being.

There was variability in the mandatory rotations and core procedures across training programs. The RCPSC defines minimum training requirements but does not provide a list of mandatory procedures. EUS and ERCP are not requirements of core training in Canada. Only one program provided EUS training, while three provided ERCP training. This is in contrast to Europe, where ERCP is included in core training (1), and in many US training sites, where the third year provides exposure

to therapeutic procedures. Although a survey conducted from 2010 showed ERCP and EUS exposure was not a priority for Canadian residents in choosing a GI training program (21), this attitude may have changed as practice has changed, and Canadian training programs may be behind our contemporaries in this shift.

Our study has several limitations. There are relatively few GI training programs in Canada, and despite an 80% response rate, this only represents 45 participants, and 52% of all adult GI residents in Canada. In addition, all study participants attended GRIT, which may represent a select population of residents who may be more interested in research and similar academic activities. The study instrument was a survey which has inherent limitations. It was open to both first- and second-year GI trainees, who have different training experiences. Recall bias remains a large concern, and there was intra-rater variability within schools. All the methods for statistical analysis were formulated post hoc, which may lead to some analysis bias.

Program directors (PD) were not included in the survey because the focus of our study was resident-experience specific. It is well documented that PD and trainee perceptions vary widely, with PDs often having a superior opinion of the program (22–26). A comparison by Patel et al. on endoscopy training in the United States showed that PDs rated their quality of endoscopy training and teachers, as well as quality of feedback, significantly higher than trainees (4). A comparison of PD responses to residents would be interesting as a future study to compare differences in perception.

CONCLUSION

Our survey highlights aspects of current gastroenterology training in Canada. There is heterogeneity across programs in rotations and procedural exposure. Smaller programs were found to

have a higher call burden but had more staff support if residents were unavailable to do call. As the Canadian medical education landscape transitions to CBME, this survey provides important information for academic committees reviewing gastroenterology training curriculums.

Supplementary data

Supplementary data are available at *Journal of the Canadian Association of Gastroenterology* online.

Acknowledgements

All authors were involved in study design, data collection, and manuscript production. KJK performed statistical analysis. Preliminary data from this project was presented as a poster at Canadian Digestive Diseases Week 2018 under the title, "State of the Nation: Gastroenterology Training in Canada". The authors have no funding or conflicts of interest to declare.

References

- Bisschops R, Wilmer A, Tack J. A survey on gastroenterology training in Europe. *Gut* 2002;50(5).
- Wells CW, Inglis S, Barton R. Trainees in gastroenterology views on teaching in clinical gastroenterology and endoscopy. *Med Teach* 2009;31(2):138–44.
- Xiong X, Barkun AN, Waschke K, Martel M; the Canadian Gastroenterology Training Program Directors. Current status of core and advanced adult gastrointestinal endoscopy training in Canada: Survey of existing accredited programs. *Can J Gastroenterol* 2013;27(5):267–72.
- Patel SG, Keswani R, Elta G, et al. Status of competency-based medical education in endoscopy training: A nationwide survey of US ACGME-accredited gastroenterology training programs. *Am J Gastroenterol* 2015;110(7):956–62.
- Lin H, Lin E, Auditore S, Fanning J. A narrative review of high-quality literature on the effects of resident duty hours reforms. *Acad Med* 2016;91(1):140–50.
- Chan BP, Fine M, Shaffer S. A206 State of The Nation: Adult gastroenterology training in Canada. *J Can Assoc Gastroenterol* 2018;1(suppl_2):305–305.
- Atsawarungruangkit A. Relationship of residency program characteristics with pass rate of the American Board of Internal Medicine certifying exam. *Med Educ Online* 2015;20:28631.
- Atsawarungruangkit A. Residency program characteristics that are associated with pass rate of the American Board of Pediatrics certifying exam. *Adv Med Educ Pract* 2015;6:517–24.
- Jhaveri KD, Sparks MA, Shah HH, et al. Why not nephrology? A survey of US internal medicine subspecialty fellows. *Am J Kidney Dis* 2013;61(4):540–6.
- Haney EM, Nicolaidis C, Hunter A, Chan BK, Cooney TG, Bowen JL. Relationship between resident workload and self-perceived learning on inpatient medicine wards: A longitudinal study. *BMC Med Educ* 2006;6(1):35.
- Thanarajasingam U, McDonald FS, Halvorsen AJ, et al. Service census caps and unit-based admissions: Resident workload, conference attendance, duty hour compliance, and patient safety. *Mayo Clin Proc* 2012;87(4):320–7.
- Haferbecker D, Fakeye O, Medina SP, Fieldston ES. Perceptions of educational experience and inpatient workload among pediatric residents. *Hosp Pediatr* 2013;3(3):276–84.
- Delva MD, Kirby JR, Knapper CK, Birtwhistle RV. Postal survey of approaches to learning among Ontario physicians: Implications for continuing medical education. *BMJ* 2002;325(7374):1218.
- Dussault C, Saad N, Carrier J. 16-hour call duty schedules: The Quebec experience. *BMC Med Educ* 2014;14(Suppl 1):S10.
- Durkin ET, McDonald R, Munoz A, Mahvi D. The impact of work hour restrictions on surgical resident education. *J Surg Educ* 2008;65(1):54–60.
- Jain G, Dzara K, Mazhar MN, Punwani M. Do regulated resident working hours affect medical graduate education? Trends in the American psychiatry board pass rates pre and post-2003 duty hours regulations. *Psychiatr Bull* 2014;38(6):299–302.
- Rajaram R, Chung JW, Jones AT, et al. Association of the 2011 ACGME resident duty hour reform with general surgery patient outcomes and with resident examination performance. *JAMA* 2014;312(22):2374.
- Ahmed N, Devitt KS, Keshet I, et al. A systematic review of the effects of resident duty hour restrictions in surgery: Impact on resident wellness, training, and patient outcomes. *Ann Surg* 2014;259(6):1041–53.
- Tierney WS, Elkin RL, Nielsen CD. Quantitative and qualitative perceptions of the 2011 residency duty hour restrictions: A multicenter, multispecialty cross-sectional study. *BMC Med Educ* 2015;15(1):57.
- Sandefur BJ, Shewmaker DM, Lohse CM, Rose SH, Colletti JE. Perceptions of the 2011 ACGME duty hour requirements among residents in all core programs at a large academic medical center. *BMC Med Educ* 2017;17(1):199.
- Khan K, Levstik M. Ranking in Canadian gastroenterology residency match: What do residents and program directors want? *Can J Gastroenterol* 2010;24(6):369–72.
- Rose JS, Waibel BH, Schenarts PJ. Disparity between resident and faculty surgeons' perceptions of preoperative preparation, intraoperative teaching, and postoperative feedback. *J Surg Educ* 2011;68(6):459–64.
- Sender Liberman A, Liberman M, Steinert Y, McLeod P, Meterissian S. Surgery residents and attending surgeons have different perceptions of feedback. *Med Teach* 2005;27(5):470–2.
- Pugh CM, DaRosa DA, Glenn D, Bell RH. A comparison of faculty and resident perception of resident learning needs in the operating room. *J Surg Educ* 2007;64(5):250–5.
- Silcox LC, Ashbury TL, VanDenKerkhof EG, Milne B. Residents' and program directors' attitudes toward research during anesthesiology training: A Canadian perspective. *Anesth Analg* 2006;102(3):859–64.
- Buschbacher R, Braddom RL. Resident versus program director perceptions about PM&R research training. *Am J Phys Med Rehabil* 1995;74(2):90–100.