

Original Article

Meeting the Motility Educational Requirements of the Gastroenterology Trainee in the 21st Century

Adriana Lazarescu, MD, FRCP(C)¹, Christopher N. Andrews, MD, FRCP(C)², Louis W. C. Liu, MEng, PhD, FRCP(C)³, David Reed, MD, PhD, FRCP(C)⁴, William G. Paterson, MD, FRCP(C)⁴, Stephen J. Vanner, MD, FRCP(C)⁴, Daniel C. Sadowski, MD, FRCP(C)¹

¹Division of Gastroenterology, University of Alberta, Edmonton, Alberta, Canada; ²Division of Gastroenterology, University of Calgary, Calgary, Alberta, Canada; ³Division of Gastroenterology, University Health Network, University of Toronto, Toronto, Ontario, Canada; ⁴Division of Gastroenterology, Queen's University, Kingston, Ontario, Canada

Correspondence: Daniel C. Sadowski, MD, FRCP(C), Division of Gastroenterology, University of Alberta, Edmonton, Alberta T6G 2X8, Canada, e-mail: dan.sadowski@ualberta.ca

ABSTRACT

Background: Gastrointestinal (GI) motility and functional disorders comprise over two-third of referrals to GI specialists yet training programs are disproportionately focused on endoscopy, inflammatory bowel disease and liver disease. Trainees at many centres receive minimal or no formal training in motility disorders and have little or no exposure to motility testing. Our purpose was to develop an educational intervention to address this learning need.

Methods: We designed a formal training program comprised of didactic sessions, workshops and hands-on motility sessions with live demonstrations designed to be held over the course of a weekend. Faculty for the course were experienced GI motility experts from across Canada. Resident trainees from all Canadian GI fellowship programs were invited to attend. Pre- and post-tests were administered to measure the baseline learning needs and the impact of the program. Course evaluations were completed by attendees.

Results: Three annual courses were offered over the past 3 years. Both adult and paediatric gastroenterology trainees attended the programs. The majority of training programs from Canada were represented. Baseline testing of attendees revealed a fundamental lack of understanding of GI motility concepts and their clinical implications. Postcourse test scores demonstrated a significant improvement in motility knowledge. Course evaluations of the content and faculty presentations received uniformly positive reviews.

Conclusions: There is a pervasive lack of clinical knowledge of GI motility among Canadian GI subspecialty trainees. A focused weekend intensive course is one step in addressing this learning need.

Keywords: *Education; Fellows; Gastroenterology; Motility disorders; Neurogastroenterology; Residents*

Gastrointestinal (GI) motility and functional disorders comprise a large group of conditions that affect the entire GI tract and can be formally categorized based on the ROME IV criteria (1). The symptoms underlying these disorders, such as dysphagia, heartburn, dyspepsia, abdominal pain and altered bowel habits are extremely common and exert a tremendous morbidity

and financial impact on patients and society. It is estimated that irritable bowel syndrome and related disorders are among the commonest causes for absenteeism from the work place or school (2). Community surveys have identified that over 10% of adult Canadians suffer from irritable bowel syndrome and direct costs of patient management has been estimated

Received: February 15, 2019; Accepted: May 3, 2019

© The Author(s) 2019. Published by Oxford University Press on behalf of the Canadian Association of Gastroenterology. This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact journals.permissions@oup.com

to be over \$1B annually (3). Fifty-five per cent of these costs are related to medical consultation and diagnostic testing (4). Despite the high prevalence of these disorders, patients often encounter diagnostic indecision by physicians, including GI specialists, and are often subjected to inappropriate testing and delay in institution of effective therapy.

Despite the recognition that GI motility disorders compromise as many as 50% of all referrals to gastroenterologists, GI fellowship training programs in Canada dedicate little time to formal training (5). While common disorders are reviewed in general GI clinics, there is little dedicated training around the diagnostic approaches and up to date treatments, and little or no exposure to patients with more specialized but not uncommon motility disorders, such as achalasia or anorectal disorders, and the necessary specialized motility testing. As a result, trainees lack an organized approach to a large proportion of patients for whom they will be caring. In addition, they do not understand the indications for advanced motility testing and are unable to apply the results from such studies to formulate a treatment plan for these patients. Moreover, they have minimal exposure to motility experts who could be role models that might encourage them to pursue specialized training in this under-represented discipline.

In response to this educational gap, the authors designed a curriculum that included the pathophysiology, clinical presentation, diagnostic approach and current therapy of the most common GI motility disorders. The curriculum was designed to be presented in a workshop format that included didactic sessions, small group case discussions, hands-on training with motility equipment and live patient demonstrations. The purpose

of this paper is to present the outcomes of the first 3 years of experience with this program.

METHODS

The program was offered annually over 1.5 days, alternating between an eastern and western Canadian site. All Canadian Royal College GI training program directors were notified and invited to encourage their residents to attend the course. All residents who wished to attend, received free registration. In addition to the content presented at the program, trainees also received written material for follow-up review. The schedule of a typical workshop is presented in [Supplementary Appendix 1](#). Between five and seven faculty members were invited to attend and were recognized motility experts from various Canadian training centres ([Figure 1](#)). Participants completed a pre- and postcourse questionnaire to provide a measure of the need and impact of the program ([Supplementary Appendix 2](#)). Trainees also submitted evaluations of the course overall as well as evaluations for each faculty member.

RESULTS

The program alternated between Edmonton and Kingston annually. The program was offered to all gastroenterology first and second year GI subspecialty residents enrolled in fellowship programs with Royal College of Physicians of Canada. In the first 3 years, 54 trainees (18 females) have participated in the program. Attendees were from GI training programs across Canada ([Figure 2](#)). The majority were in their first year of subspecialty training and 7 of 54 were in paediatric gastroenterology training programs. The precourse questionnaire



Figure 1. Faculty at the GI Motility Course, Kingston, Ontario, 2017. R to L—Dr. Louis Liu (Toronto), Dr. Geoffrey Turnbull (Dalhousie), Dr. William Patterson (Kingston), Dr. Adriana Lazarescu (Edmonton), Dr. Stephen Vanner (Kingston), Dr. Daniel Sadowski (Edmonton), Dr. David Reed (Kingston).

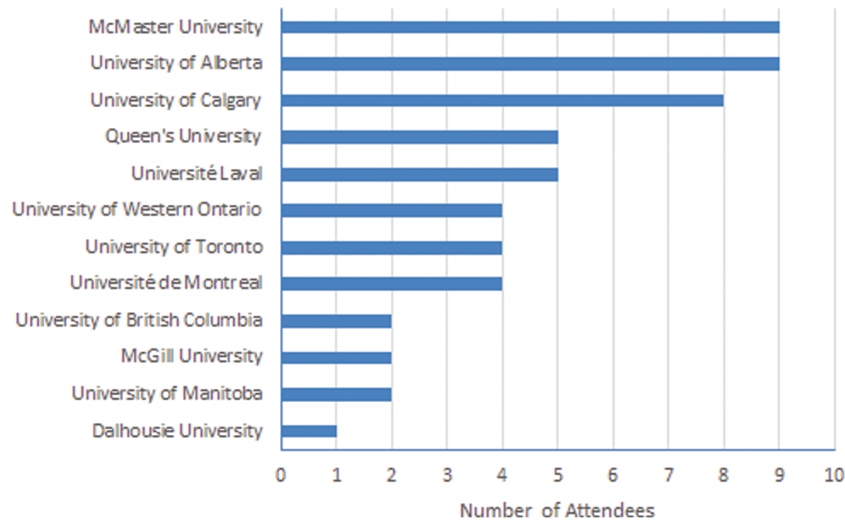


Figure 2. Number of course attendees by institution.

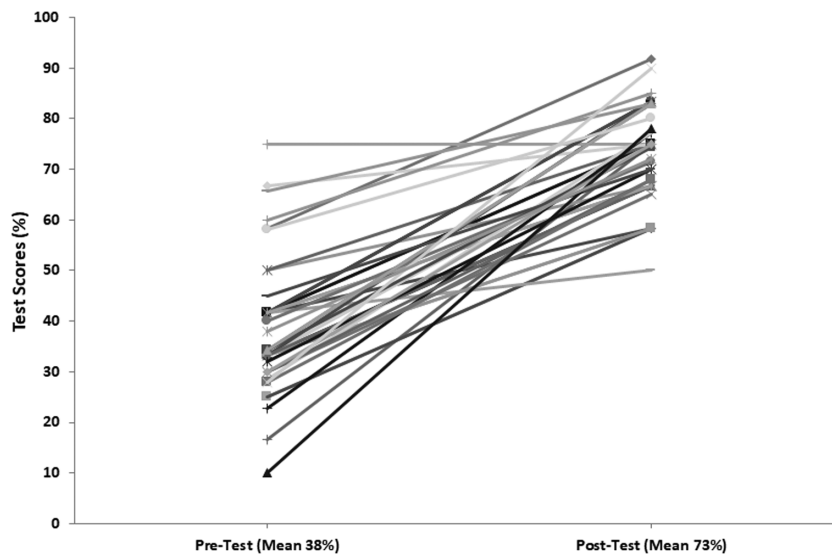


Figure 3. Pre- and postcourse test scores.

demonstrated that there were major gaps in knowledge around fundamental motility concepts with an average test score of 38% (95% confidence interval [CI] 34.4, 42.7; Figure 3). The average post-test score was 73% (95% CI 69.9, 75.7). The significant increase in post-test scores ($P = <0.01$ paired T -Test) suggests that the course successfully addressed a number of knowledge gaps. A total of 18 out of 54 attendees submitted course evaluations. The results can be found in Table 1.

Discussion

Neurogastroenterology and motility is a rapidly evolving field. In the past decade, there have been major advances in the understanding of the neuroenteric nervous system and the gut brain axis in the pathogenesis of visceral pain (6). New

diagnostic tools such as high-resolution manometry, EndoFlip and ambulatory pH and impedance studies have improved the clinical assessment and therapies of diseases such as achalasia (7) and gastroesophageal reflux (8). Recently, the American Neurogastroenterology and Motility Society and the European Society of Neurogastroenterology and Motility issued a joint statement outlining a proposed curriculum for GI residency training (9). This report suggested a tiered approach based on career path of the trainee. At a minimum, all trainees should be able to recognize motility disorders, order appropriate investigations and initiate a rational plan of management. This requires dedicated time in core training years to achieve this basic competency. However, a recent survey of Canadian gastroenterology trainees identified that only one-third came from training programs that offered a motility rotation as part

Table 1. Overall attendee course evaluations ($N = 18$)

With respect to the course overall, please answer the following questions using the scale below					
1	2	3	4	5	6
(Strongly Disagree)	(Neutral)			(Strongly Agree)	
Question	Average response score				
The material covered during the day met my expectations	5.5				
The material covered during the day was free from commercial bias	5.4				
The venue for the course was adequate	5.5				
I would recommend this course to other trainees in my program	5.7				

of their core training (10). A similar pattern of training was observed in an informal survey of American gastroenterology training programs (11). The positive response to our program by attendees highlights an alarming concern that trainees are not receiving sufficient training in GI motility and functional disorders in their training programs. This concern is supported by their pretest scores that demonstrated a poor knowledge of fundamental concepts in these disorders.

Specialized motility training is either not available at some training centres or is managed by other disciplines (e.g., surgeons or respirologists) where access to motility training for GI trainees is limited. Even at training centres where specialized training is available, trainees' time is often dominated by other areas, especially endoscopy, inflammatory bowel disease and liver disease, as a result even at these centres training in motility is under-represented. The program described in this paper was designed to at least partially address these challenges in a compacted training schedule by consolidating advanced training in the fundamentals of this discipline.

A significant limitation of this educational intervention is that it did not involve direct exposure to patients with motility or functional disorders, nor did it attempt to assess long-term retention and application of knowledge. As well, the content of the program was geared mainly to adult GI trainees. Future iterations of the program will endeavour to expansion the content to the specific needs of paediatric GI trainees. As well, greater effort will be required to reach regional programs with low representation such as the Maritimes and Quebec. Greater emphasis on case-based discussions of GI motility disorders in future courses will help improve the clinical relevance of the course material.

The training of gastroenterology consultation skill, particularly in GI motility, is best done in an apprenticeship environment where the nuance and subtleties of clinical management in this area can be addressed (12). In the immediate future, speciality medical training in Canada will be moving to a competency-based platform (13). The results of our intervention demonstrate the need for an intensive learning program such as this in GI motility. However, a greater impact will

result from the inclusion of motility and functional disorders as entrustable professional activities achieved by the gastroenterology trainee.

Supplementary Data

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

Acknowledgements

The program has been generously supported annually by an unrestricted educational grant from Allergan Inc., provided either to the program organizers directly or through the Canadian Digestive Health Foundation. The authors would also like to thank Medtronic Inc. and Sandhill Inc., manufacturers of motility equipment, for providing scientific liaison personnel to assist in the technical aspects of the hands-on sessions of the program. The authors would also like to thank the Canadian Neurogastroenterology Network (CNN) for its support.

References

- Drossman DA, Hasler WL. Rome IV-functional GI disorders: Disorders of gut-brain interaction. *Gastroenterology* 2016;150(6):1257–61.
- Canavan C, West J, Card T. Review article: The economic impact of the irritable bowel syndrome. *Aliment Pharmacol Ther* 2014;40(9):1023–34.
- Boivin M. Socioeconomic impact of irritable bowel syndrome in Canada. *Can J Gastroenterol* 2001;15 Suppl B:8B–11B.
- Fedorak RN, Vanner SJ, Paterson WG, et al. Canadian Digestive Health Foundation Public Impact Series 3: Irritable bowel syndrome in Canada. Incidence, prevalence, and direct and indirect economic impact. *Can J Gastroenterol* 2012;26(5):252–6.
- Peery AF, Dellon ES, Lund J, et al. Burden of gastrointestinal disease in the United States: 2012 update. *Gastroenterology* 2012;143(5):1179–87.e3.
- Vanner SJ, Greenwood-Van Meerveld G, Mawe GM, et al. Fundamentals of neurogastroenterology: Basic science. *Gastroenterology* 2016;150:1280–1291.
- Kahrilas PJ, Pandolfino JE. Treatments for achalasia in 2017: How to choose among them. *Curr Opin Gastroenterol* 2017;33:1–7.
- Gyawali CP, Kahrilas PJ, Savarino E, et al. Modern diagnosis of GERD: The Lyon Consensus. *Gut* 2018;67(7):1351–62.
- Gyawali CP, Savarino E, Lazarescu A, et al. Curriculum for neurogastroenterology and motility training: A report from the joint ANMS-ESNM task force. *Neurogastroenterol Motil* 2018;30(9):e13341.
- Chan BPH, Fine M, Shaffer S, Khan KJ. Resident survey on gastroenterology training in Canada. *Journal of the Canadian Association of Gastroenterology* 2018;2(1):44–48.
- Rao SS, Parkman HP. Advanced training in neurogastroenterology and gastrointestinal motility. *Gastroenterology* 2015;148(5):881–5.
- Vasant DH, Sharma A, Bhagatwala J, et al. Apprenticeship-based training in neurogastroenterology and motility. *Expert Rev Gastroenterol Hepatol* 2018;12:215–222.
- Busing N, Harris K, MacLellan AM, et al. The future of postgraduate medical education in Canada. *Acad Med* 2015;90(9):1258–63.