

Original Article

## Inflammatory Bowel Disease Training During Adult Gastroenterology Residency: A National Survey of Canadian Program Directors and Trainees

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### Abstract

**Background:** Clinical training in inflammatory bowel disease (IBD) is a mandated component of adult gastroenterology fellowship. This study aims to assess methods of instruction in IBD and identify priorities and gaps in IBD clinical training among residents and program directors (PDs).

**Methods:** Using both an online and in-person platform, we administered a 15-question PD survey and 19-question trainee survey that assessed the methods of IBD teaching and trainee perceptions of knowledge transfer of 22 IBD topics. The survey was previously developed and administered to US gastroenterology trainees and PDs.

**Results:** Surveys were completed by 9 of 14 (62.3%) PDs and 44 of 62 (71%) trainees. Both trainee years were equally represented (22 residents in each year of training). All respondents were based at university teaching hospitals with full-time IBD faculty on staff. Dedicated IBD rotations were not offered by more than half of training programs, and IBD exposure was most commonly encountered during inpatient rotations. Overall, only 14 (31.2%) trainees were fully satisfied with the level of IBD exposure during their training. Thirty-six (81.8%) trainees reported being comfortable with inpatient IBD management, whereas only 23 (52.3%) trainees reported being comfortable with outpatient IBD management. There was strong concordance between the proportion of PDs ranking an IBD topic as essential and trainee comfort in that area (Pearson's rho 0.59;  $P=0.004$ ). Fewer than half of trainees reported comfort in 11 of 22 (50%) proposed IBD topics. Identified areas of deficiency included phenotypic and endoscopic classification of IBD, inpatient management of severe active IBD, perianal disease management, monitoring biologic therapy and extra-intestinal manifestations of IBD.

**Conclusions:** Only one-third of Canadian gastroenterology trainees are fully satisfied with the level of IBD exposure under the current training model. Furthermore, several IBD topics appear to be inadequately covered during training. Our findings, which are similar to previously published US data, highlight the need for additional focus on IBD during gastroenterology residency.

**Keywords:** *Canada; Inflammatory bowel disease; Medical education; Program directors; Residency training; Trainees*

The rapid introduction of new medications and an evolving treat-to-target paradigm have had a profound effect on the care of patients with inflammatory bowel disease (IBD). Gastroenterologists caring for patients with IBD have an increasingly complex armamentarium of medical therapies and treatment targets. When these skills are used properly, specialist care has been shown to improve outcomes in patients with Crohn's disease, with one study demonstrating surgery rates being reduced by one-third (1). While these changes are exciting to all who treat patients with IBD, it remains unclear if training programs are uniformly ready to teach these novel diagnostic and treatment schemas for IBD. In the Canadian context, this is particularly relevant given the high epidemiologic and financial burden of IBD. Ontario has one of the highest rates of IBD in the world, with a standardized incidence rate of 26.2 per 100,000 in 2008. A report released in 2012 by Crohn's and Colitis Canada estimated the cost of IBD to the Canadian health system was approximately \$2.8 billion in 2012, more than \$11,900 per person with IBD each year (2).

Inflammatory bowel disease education is an identified component of fellowship training in gastroenterology (GI). In the United States, the ability to identify and manage patients with luminal GI disease (including IBD) has been identified by five GI societies as one of the 13 core entrustable professional activities (EPAs) for GI fellowship training (3). In Canada, previous objective-based curriculums have broadly mentioned inflammatory diseases of the GI tract. The Royal College of Canada is currently developing a gastroenterology curriculum using the competency-based education model. It is unclear if this curriculum will specifically identify IBD as a required topic of study.

Evidence suggests there may be deficiencies with IBD related knowledge transfer in training programs. A recent study from the US, where fellowship training is three years, demonstrated less than half of fellows feel comfortable with IBD care, and only 28% felt comfortable with their exposure to treatment strategies (4). Significant variation exists among training programs, suggesting there may be a need for additional advanced fellowship training programs. In Canada, where gastroenterology fellowship training is two years, no data exist about the performance of training programs in providing trainees with the necessary knowledge to assess, treat and manage patients IBD.

The aim of this study was to assess the modes of IBD training in Canadian adult gastroenterology programs, to assess program directors' (PDs) perceptions of training of various IBD topics, and to identify areas where trainees are not confident in their training.

## METHODS

We created and administered two online structured surveys: a PD survey and a trainee survey. These instruments were based on previously published work by Cohen et al. (4). The PD

survey assessed program demographics, which included program size, number of IBD specialty faculty, and the extent and nature (outpatient versus inpatient) of IBD exposure offered to trainees. PDs were asked to rate the importance (e.g., essential for fellowship trainees, desirable but not core competency or not a core competency) of 22 previously proposed IBD core competencies (Table 1).

The trainee survey assessed program characteristics and trainee-reported training and career preferences, including interest in advanced IBD fellowships. Trainees were asked to rate their satisfaction with the level of inpatient and outpatient IBD training offered in their programs. Finally, trainees were asked to rate their comfort level with training in various IBD topics (e.g., no training, adequate training, unsure adequacy of training, mostly comfortable with training or confident about my training). Specific clinical settings were presented to the trainees to identify trainee comfort in management of IBD in special situations, including care of pregnant patients with IBD and postsurgical recurrence prevention.

The surveys were sent electronically to all 14 Canadian GI program directors. Two reminder emails were sent to PDs who did not respond to the initial invite at two-week intervals. The trainee surveys were distributed at the gastroenterology resident course prior to the Canadian Digestive Diseases Week in Banff, Canada, in 2017. Additional surveys were sent electronically to trainees that had not attended the gastroenterology resident course. All responses were collected anonymously through an online platform.

Standard descriptive statistics summarized demographic characteristics and overall responses for each question. Categorical data were compared using chi-square test. Continuous data were compared using nonparametric Wilcoxon 2-sample tests. A P value of 0.05 was considered statistically significant. All analyses were conducted using SPSS v17 (SPSS Inc., Chicago, IL, USA).

The study was approved by the Research Ethics Board at Mount Sinai Hospital in Toronto, Canada.

## RESULTS

### Program Director Survey

Program director response rate was 64.3% (9 of 14). The results of the PD survey are shown in Table 2. All respondents were based at university teaching hospitals with full-time IBD faculty on staff. All programs had faculty members that identified as IBD experts. All programs participated in IBD clinical trials. Most training programs surveyed offered an additional year of advanced IBD fellowship training (7 of 9, 77.8%). More than half of programs offered a dedicated outpatient IBD rotation, but no programs offered a dedicated inpatient IBD rotation. One-third of programs offered no dedicated IBD rotations at all. Most programs reported that their trainees spend 10% to

**Table 1.** Proposed IBD core topics

C1	Phenotypic classification of Crohn's disease and Ulcerative colitis
C2	Classifying clinical disease severity in IBD using disease activity indices
C3	Classifying endoscopic disease severity in IBD using endoscopic indices
C4	Outpatient management of steroid dependent ulcerative colitis
C5	Inpatient management of severe/fulminant ulcerative colitis
C6	Medically managing J-pouch complications including acute and chronic pouchitis
C7	Performing and identifying landmarks and findings on pouchoscopy
C8	Outpatient management of steroid dependent Crohn's disease
C9	Inpatient management of active Crohn's disease
C10	Medical, endoscopic and surgical management of stricturing Crohn's disease
C11	Medical and surgical management of fistulizing Crohn's disease
C12	Medical and surgical management of perianal Crohn's disease
C13	Management of an ostomy and related complications
C14	Management of extraintestinal manifestations of IBD
C15	Initiating, monitoring and management of 5ASAs
C16	Initiation, monitoring and management of immunomodulator therapy in Crohn's disease and Ulcerative colitis
C17	Initiation, monitoring and management of biologic therapy in Crohn's disease and Ulcerative colitis
C18	Therapeutic drug monitoring in IBD
C19	Communicating risks of therapies in IBD
C20	Recognizing indications for surgery in IBD
C21	Tailoring therapy for prevention of postoperative recurrence in Crohn's disease
C22	Communicating risks of therapies and disease in pregnant women with IBD

\*Adapted from Cohen et al.

30% of their time caring for IBD patients on both inpatient and outpatient rotations. Didactic teaching in IBD was offered monthly by most programs (6 of 9, 66.7%).

### Trainee Survey Demographics and IBD Career Interests

The trainee response rate was 71.0% (44 of 62). The total trainee number was determined using data from the Canadian Resident Matching Service website. The results of the trainee survey are shown in [Table 3](#). The majority of respondents were male (31 of 44, 70.5%). There was equal representation of both training years among respondents. All respondents indicated that their program had a full-time 'IBD expert' on faculty. Similar to the PD responses, most trainees reported spending 10% to 30% of their time caring for IBD patients on both inpatient and outpatient rotations. However, in contrast to PD responses, more than half of trainees reported not having a dedicated IBD rotation (24 of 44, 54.5%). Monthly didactic teaching in IBD was reported by one of five trainees (11.4%), but most trainees reporting didactic IBD teaching every one to three months (26 of 44, 59.1%).

In terms of IBD career interests among trainee respondents, 24 (54.5%) respondents indicated an interest in pursuing a career in community (11 of 44, 25%), academic (8 of 44, 18.2%), or research IBD care (5 of 44, 11.4%). Seventeen (38.6%) respondents indicated an interest in pursuing a

third-year advanced IBD fellowship. Of those not interested in pursuing an advanced IBD fellowship, only five (5 of 25, 18.5%) indicated that they felt they already have enough IBD exposure from general GI fellowship training program. Half of respondents indicated that they would pursue or are willing to consider the option of an IBD-focused GI fellowship training program.

### IBD Topics and Training Satisfaction

Overall, only 14 (31.2%) trainees were fully satisfied with the level of IBD exposure during training. In terms of trainee-reported comfort with IBD training, 10 trainees (22.8%) reported no or inadequate training in outpatient IBD care, and two trainees (4.5%) reported no or inadequate training in inpatient IBD care. More than half of trainees (52.3%) reported being mostly comfortable or comfortable with outpatient IBD care, whereas 81.8% reported being mostly comfortable or comfortable with inpatient IBD care ( $P < 0.01$ ). Stratified by training year, PGY-5 trainees were more likely to report being mostly comfortable or comfortable with outpatient (59.1% versus 45.5%,  $P < 0.01$ ) and inpatient (90.9% versus 72.7%,  $P < 0.01$ ) IBD care compared with PGY-4 trainees.

Trainee-reported confidence in proposed IBD topics and the proportion of PDs viewing an IBD topic as a "core topic essential for IBD training" are shown in [Figure 1](#). There was strong

**Table 2.** Demographics of participating programs completing the program director survey (n=9)

Number of residents in program, mean (SD)		7 (2)
Number of faculty in program, mean (SD)		20 (12)
Number of IBD faculty in program, mean (SD)		4 (2)
Advanced IBD fellowship offered in training program, n (%)		7 (77.8)
Percent of graduating fellows choosing community practice careers over the last 5 years, n (%)	<25%	2 (22.2)
	25–50%	2 (22.2)
	51–75%	3 (33.3)
	>75%	2 (22.2)
Percent of graduating fellows choosing academic careers over the last 5 years, n (%)	<25%	1 (11.1)
	25–50%	6 (66.7)
	51–75%	2 (22.2)
	>75%	0 (0)
Does your program have dedicated IBD-specific rotations during GI fellowship? n (%)	Inpatient rotations	0 (0)
	Outpatient rotations	5 (55.6)
	Mix of inpatient and outpatient rotations	1 (11.1)
	No dedicated IBD rotations	3 (33.3)
Percentage of time spent on IBD care during outpatient rotations, n (%)	<10%	0 (0)
	10–30%	7 (77.8)
	31–50%	2 (22.2)
	>50%	0 (0)
Percentage of time spent on IBD care during inpatient rotations, n (%)	<10%	2 (22.2)
	10–30%	5 (55.6)
	31–50%	1 (11.1)
	>50%	1 (11.1)
Frequency of didactic teaching in IBD, n (%)	Monthly	6 (66.7)
	every 1–3 months	3 (33.3)
	every 4–6 months	0 (0)
	every 7–12 months	0 (0)
Practice setting in a university hospital, n (%)		9 (100)
Institution participation in IBD clinical trials, n (%)		9 (100)

concordance between the proportion of PDs ranking a topic as essential and trainee comfort in that area (Pearson's rho 0.59;  $P=0.004$ ). Of the 22 IBD core topics, trainee-reported confidence rates of less than 50% were reported in 11 competencies (50%). These included, in order of increasing confidence, inpatient management of Crohn's disease (9.1%); initiation, monitoring and management of biologics (11.4%); phenotypic classification (25%); endoscopic severity indices (27.3%); extra-intestinal manifestations (27.3%); perianal Crohn's disease (29.5%); fulminant ulcerative colitis (31.8%); management of postoperative recurrence in Crohn's disease (38.6%); pouchoscopy (43.2%) initiation; monitoring and J-pouch management of 5-ASA (43.2%); and communicating risk of therapies (47.7%).

When asked how their IBD educational experience may be improved during fellowship training, the following approaches were endorsed by respondents: increased clinical exposure to

patients with IBD (45%), increased IBD-centered didactics as part of the core curriculum (28%), increased access to trainee-centered IBD web resources (14%) and increased interaction with IBD experts (13%).

## DISCUSSION

In this cross-sectional, nationwide survey of GI PDs and trainees, we assessed overall satisfaction with IBD training during GI residency and identified IBD topics that trainees believe need improvement in teaching. Canadian trainees reported a high degree of interest in IBD care as a career, with more than half of trainees reporting an intention to pursue an IBD-focused career. Despite this interest, we demonstrated that only one-third of Canadian trainees were fully satisfied with the level of IBD exposure during training. Our findings highlight a significant deficiency in outpatient IBD training, where most IBD care

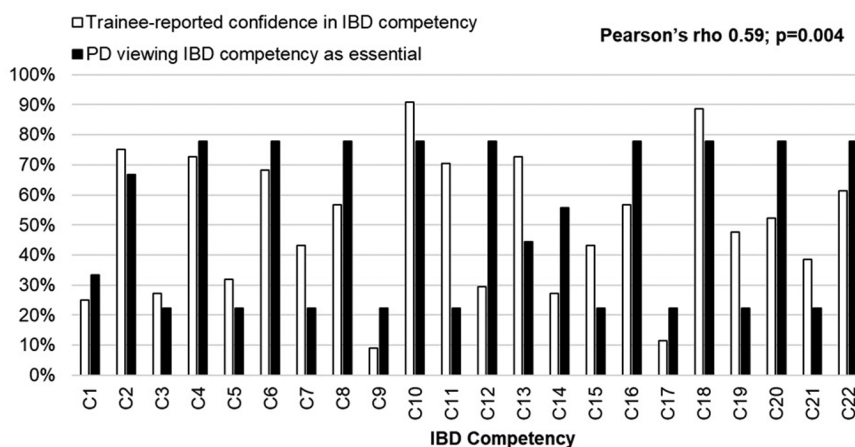
**Table 3.** Demographics and IBD career interest of trainees completing the survey (n=44)

Size of GI training program (number of fellows), mean (SD)		7 (3)
Gender, n (%)	Male	31 (70.5)
	Female	13 (29.5)
Training year, n (%)	PGY-4	22 (50)
	PGY-5	22 (50)
IBD expert on faculty, n (%)		44 (100)
Dedicated IBD-specific rotation, n (%)	Inpatient rotation	5 (11.4)
	Outpatient rotation	9 (20.5)
	Mix of inpatient and outpatient rotations	6 (13.6)
	No dedicated IBD rotation	24 (54.5)
Percentage of time spent on IBD care during outpatient rotations, n (%)	<10%	2 (4.5)
	10–30%	23 (52.3)
	31–50%	15 (34.1)
	>50%	4 (9.1)
Percentage of time spent on IBD care during inpatient rotations, n (%)	<10%	3 (6.8)
	10–30%	26 (59.1)
	31–50%	14 (31.8)
	>50%	1 (2.3)
Frequency of didactic teaching in IBD, n (%)	Monthly	5 (11.4)
	every 1–3 months	26 (59.1)
	every 4–6 months	12 (27.3)
	every 7–12 months	1 (2.3)
What describes your level of outpatient IBD exposure best, n (%)	I do not have training in outpatient IBD management	1 (2.3)
	I feel I have inadequate training in outpatient IBD management	9 (20.5)
	I am unsure how adequate my current training level is in the outpatient IBD management	11 (25)
	I am mostly comfortable with my current training level in outpatient IBD management	18 (40.9)
	I am comfortable with my current training level in outpatient IBD management	5 (11.4)
	I do not have training in inpatient IBD management	0 (0)
What describes your level of inpatient IBD exposure best, n (%)	I feel I have inadequate training in inpatient IBD management	2 (4.5)
	I am unsure how adequate my current training level is in the inpatient IBD management	6 (13.6)
	I am mostly comfortable with my current training level in inpatient IBD management	25 (56.8)
	I am comfortable with my current training level in inpatient IBD management	11 (25)
	I have no interest in pursuing a career in IBD	3 (6.8)
Career interest in IBD, n (%)	I am interested in IBD but would not like to pursue a career in IBD	17 (38.6)
	I am interested in IBD and would like to pursue a career in IBD in a non-academic setting	11 (25)
	I am interested in IBD and would like to pursue a career in IBD in an academic setting in which I do mostly clinical work (see patients, do procedures, etc)	8 (18.2)
	I am interested in IBD and would like to pursue a career in IBD in an academic setting in which I do mostly research work (basic or clinical research > 50% of the time)	5 (11.4)



**Table 3.** (Continued)

Trainees considering completing a 3rd-year advanced IBD fellowship, n (%)		17 (38.6)
Reasons for not considering an advanced IBD fellowship (n=27), n (%)	Not interested in IBD as a career focus	16 (59.3)
	Not interested in extending GI residency training program by another year	6 (22.2)
	Already have enough IBD exposure from general GI residency training program	5 (18.5)
If you had the option of an IBD focused GI residency training program, would you choose this option? n (%)	Yes	11 (25)
	No	22 (50)
	Willing to consider	11 (25)

**Figure 1.** Trainee-reported confidence in proposed IBD competencies, along with the proportion of PDs viewing an IBD competency as a core competency essential for IBD training.

is delivered. Although most trainees are comfortable with inpatient management of IBD at the completion of training, just over 50% reported being comfortable with outpatient management of IBD. Furthermore, trainees were not comfortable in greater than 50% of proposed IBD topics surveyed, particularly in those addressing complex IBD care.

All respondent programs were based at university hospitals, with access to full-time IBD faculty and IBD clinical trials. Even though monthly didactic IBD teaching was reported by two-thirds of PDs, only 11.4% of trainees reported monthly didactic IBD teaching. In a prior study of US GI training programs and their trainees, monthly IBD didactic teaching was the only significant predictor of IBD training satisfaction (4). In our study, one-third of trainees suggested increasing IBD-centered didactics as the single most effective intervention to improve their satisfaction with IBD training. These findings suggest that formal and frequent didactic instruction in IBD are an essential component of training in IBD. The availability of local didactic sessions may be highly dependent on the availability of qualified faculty to teach this topic. In smaller centers, this may place a heavy burden on the few IBD expert faculty members. Our results also suggest a possible discordance in PD perception of the availability of didactic sessions with trainee attendance. It is

possible that increasing service requirements may prevent trainees from attending didactic sessions and prevent faculty from teaching (5).

Several national meetings and programs may be able to address the need for more formal educational programming. These include the monthly Canadian Association of Gastroenterology (CAG) webinar lecture series, which is delivered nationally via teleconference. Another educational opportunity that is available to Canadian GI residents is the Meeting of the Minds IBD Forum, which is a two-day event organized by Crohn's and Colitis Canada. This event provides an IBD update through its Mentoring in IBD symposium and discusses future directions in IBD care, which is delivered by a panel of nationally recognized experts. In addition, a Canadian GI fellows program in IBD is offered every other year to Canadian fellows. Other IBD courses are offered at the international level, including the American College of Gastroenterology postgraduate course and IBD school and the Digestive Disease Week postgraduate course (Table 4). Our study did not assess the educational impact of these events on satisfaction with IBD training. Program directors should provide these options to their trainees at the beginning of training to ensure uniform opportunity to attend these meetings.

**Table 4.** National and international meetings with IBD related educational programs

Name of Meeting	Location	Time of Year
Meeting of the Minds	Toronto	Fall-Winter
Canadian GI Fellows Program in IBD	Toronto	Every other winter
Canadian Digestive Disease Week	Rotating	Winter
Digestive Disease Week	Rotating	Summer
American College of Gastroenterology Conference	Rotating	Fall
American College of Gastroenterology IBD School	Rotating	Various dates

An interesting finding of our analysis is that trainee self-confidence in IBD topics was higher than satisfaction with exposure to the same IBD topics during training. A few possible explanations exist for this trend, which was also demonstrated among US trainees. IBD-specific training is difficult to quantify and likely encompasses exposure in both dedicated IBD rotations and general GI rotations. It is almost certain that some training in the management of IBD is obtained from general GI rotations (6). Such training, although contributing to competence, may not be viewed as “IBD-specific” training by trainees. Second, it is possible that while high levels of comfort may be noted in the management of mild-to-moderately complex cases of IBD, the level of comfort with complex IBD seems low (as noted in our assessment of the comfort for competencies such as Crohn’s perianal disease, pouch-related issues, extra-intestinal manifestations of IBD, etc.). This may also explain the low comfort levels with inpatient Crohn’s disease and fulminant ulcerative colitis patients. Consequently, the need for additional training and exposure in the management of complex IBD may be necessary.

Interest in pursuing an IBD-focused career was high among Canadian GI trainees. In our study, 38.6% of trainees reported interest in pursuing a third-year fellowship in advanced IBD care. This was higher than the number reported by American GI fellows, which was 9%. This is likely explained based on shorter training duration in Canada compared with the US (two years versus three years, respectively) and general differences in the delivery of care. It is plausible that the additional year of training provides more time to obtain comfort in IBD management, therefore decreasing the need and desire for additional IBD training (6). Despite this difference, reported confidence in IBD training reported by Canadian trainees seemed to be comparable to their American counterparts, and the contribution of the additional year to added confidence in IBD care remains unclear. Another possible reason for interest in additional training among Canadian trainees may be a lack of available job opportunities following the completion of core GI training (7).

Our study has several strengths. First, we achieved a good response rate that allows us to draw meaningful and generalizable conclusions about the state of Canadian IBD training.

We used a previously published survey, which allows comparison of Canadian trainees with their American counterparts. Finally, the survey was administered towards the conclusion of the academic year, allowing an assessment of PGY-4 trainees at the halfway point of their training and PGY-5 trainees as they prepare to enter advanced fellowship or independent practice. Several limitations also exist. Our study only assessed active GI trainees and excluded recent graduates. Recent graduates may provide a more realistic picture of the adequacy of their IBD training. Another limitation is that we relied on self-assessment of trainees as a proxy for the quality of training, which may introduce various biases. Future studies might attempt to link training experience to their IBD knowledge. One potential option would be to assess scores on IBD questions from the Royal College licensing exam and compare them across different universities. It is possible that other GI-related subjects need additional assessment; however, a lack of available standardized data precludes comparison. We chose to assess IBD training as it is becoming an increasingly complex area of practice. In addition, Ananthakrishnan et al. have shown that patients treated at high-volume IBD centres may have improved outcomes and decreased readmissions (8).

We have demonstrated GI trainees in Canada are not confident in certain IBD topics when entering independent practice. Two years of training may not be sufficient to develop the knowledge and skills required to be an expert in IBD. Most countries outside of Canada mandate a three-year training program for GI trainees. Some Canadian universities offer a third-year advanced fellowship in IBD. There is a strong desire for these types of programs, with nearly 40% of respondents expressing interest in this type of fellowship. There may also be a need for improved organization and standardization of didactic teaching across the Canadian universities. Only 10% of respondents suggested they received teaching in IBD more than once a month. One potential solution would be to create an expert review series, directed towards PGY-4s and PGY-5s, highlighting IBD topics identified as weak in training.

To our knowledge, advanced IBD fellowships do not have a standardized curriculum. Future initiatives may focus on developing an advanced fellowship curriculum, possibly

utilizing a similar approach to the European Crohn's and Colitis Organization (9). This may help facilitate the development of a formal certification process. Multiple subspecialties, including hepatology, have fostered recognition of advanced training through the development of Area of Focused Competence certification, which is offered by the Royal College of Physicians and Surgeons of Canada (10).

In summary, our findings suggest a wide range of trainee-reported comfort in knowledge of core IBD topics. Canadian GI trainees are generally comfortable with inpatient management of IBD, but deficiencies exist in knowledge of outpatient management of IBD and several areas of complex IBD management. We hope our findings will stimulate the creation of a more formalized IBD curriculum. As IBD diagnostics and treatments become increasingly complicated and numerous, the development of formal training and assessment methods will further help train the next generation of IBD experts and allow them to provide the most up-to-date and effective care.

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### Conflicts Of Interest

The authors have no relevant conflicts of interest to disclose.

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