

Original Article

Gastroenterologist Consultation Is Uncommon but Associated with Improved Care Among IBD Patients Presenting to Emergency Departments in Winnipeg Hospitals

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Abstract

Objective: To describe the patterns of care when persons with inflammatory bowel disease (IBD) present to the Emergency Department (ED) and post-ED follow-up.

Methods: We linked the University of Manitoba IBD Epidemiology Database with the Emergency Department Information System of the Winnipeg Regional Health Authority from January 1, 2010 to December 31, 2012. We then generated a list of all ED attendances by persons with IBD at four of six hospitals within the City of Winnipeg (two academic and two community hospitals). The charts were reviewed by two investigators extracting data on testing, consulting and treatment undertaken in the ED as well as postdischarge follow-up. We focused on outcomes among those attending the ED but not admitted to hospital.

Results: Of 1275 IBD patients with a first visit to the ED, 523 (41%) were for IBD-specific complaints. Three hundred and twenty-seven (62.5%) were discharged from the ED without an in-hospital admission. Nearly 80% had an identified gastrointestinal (GI) specialist (either gastroenterologist or GI surgeon) involved in their care. A gastroenterologist was consulted in the ED 20% of the time. Follow-up post-ED with a gastroenterologist was only documented in 36%. For those who saw a gastroenterologist in the ED, there was more likely to be a change in medications and follow-up arranged with a gastroenterologist. ED consultation with a gastroenterologist was the only predictor of seeing a gastroenterologist in follow-up post-ED.

Conclusions: ED gastroenterology consultation is more likely to effect IBD management change. When discharged from the ED gastroenterology, follow-up should be arranged and documented.

Keywords: *Crohn's disease; Emergency medicine; Hospitalization; Optimized care; Ulcerative colitis*

Introduction

Persons with inflammatory bowel disease (IBD) are more likely to present to the Emergency Department (ED) than the general population (1,2). American data suggest that the use of EDs by persons with IBD is common across North America (3,4)

and is increasing (5). They also have longer ED stays and are more likely to have multiple ED visits (1). Persons with IBD may access the ED when acutely unwell, but often the ED is the care option of choice because they cannot access their primary care physicians or a gastroenterologist in a timely manner

(6). We have previously reported that among incident cases of IBD who presented to the ED, 44% were admitted to hospital in relation to that ED presentation. Among established cases of IBD who attended in the ED, only 15.4% were hospitalized (1). Presumably those admitted through the ED were sufficiently ill to warrant ED care for their acute problems. For those not admitted, it is possible that many could have avoided ED care if an alternate option was available. Provision of emergency care to persons with IBD who do not truly need to be seen in the ED is expensive (7) and may lead to excess or inappropriate testing or treatment (8). We have studied the use of ED in Manitoba by persons with IBD using administrative data, however administrative data often does not allow for a granular assessment of the details of the exact reason for the ED visit (1,7).

Our goal of the current study was to determine the frequency of testing and consultation undertaken through the ED, the types of medications initiated through the ED, and the nature of follow-up planned post-ED discharge. Hence, we undertook a chart review study of ED visits in four of the six acute care hospitals in the City of Winnipeg to evaluate the process of care for persons with IBD who present to the ED with symptoms potentially related to IBD.

Methods

Description of Data Sources

The University of Manitoba IBD Epidemiology Database (UMIBDED) is a population-based health administrative database of all persons with IBD in Manitoba. It was developed in 1995 with a validated administrative data definition of IBD (9). The UMIBDED was extracted from data collected by Manitoba Health (MH), the single publicly funded health insurance provider to residents of the province of Manitoba. It contains all health care contacts both inpatient hospitalizations and outpatient physician visits dating back to April 1, 1984. However, it does not include information on ED visits. Each resident of Manitoba has a unique personal health identification number (PHIN) that allows for longitudinal individualized patient profiles to be created to track health outcomes over time, as well as linkage to other administrative databases. A person is considered to have IBD if he/she has ≥ 5 health care contacts (hospital visits or physician visits) associated with an ICD-9 or ICD-10 code for IBD, or >3 health contacts if registered with MH for 2 years or fewer. The case definition for IBD has been shown to be 80 to 90% sensitive and specific both for identifying persons with IBD and differentiating between Crohn's disease (CD) and ulcerative colitis (UC) (9). In order to assess ED utilization, the UMIBDED was linked through each subject's PHIN to the Winnipeg Regional Health Authority Emergency Department Information System database (WHRA-EDIS) for this study. The WRHA is the largest health region in Manitoba, and serves the population of Winnipeg and its surrounding areas, with a population of approximately 800,000. EDIS is a computerized patient

tracking and electronic medical record system currently used in all six Winnipeg's EDs dating back to 2009.

Study Population

All persons in the UMIBDED (cases and controls) who were living in the WRHA catchment area from January 2010 to December 2012 and who presented to the ED during that period (by identification within the EDIS) were identified. Linkage of the UMIBDED to WHRA-EDIS was done deterministically using the PHIN by MH, who in turn generated a list of patients by names who presented to one of four hospitals (two academic tertiary care, two community-based) during the study period. Each hospital during the period of the study was using paper charts and charts of the individuals were pulled by the health record departments of each hospital to facilitate review. The study was approved by the University of Manitoba Research Ethics Board and the study review and ethics boards of the WRHA and of each participating hospital.

Chart Review

Charts were reviewed to obtain information from the first IBD-related visit occurring during the study period. If persons had multiple IBD-related visits during the study period, only the first ED visit was reviewed. Information extracted included sex, age, duration of IBD, IBD diagnosis (CD or UC), IBD-specific complaints, whether or not the person had an identified gastroenterology specialist providing previous care, IBD-specific medications used at time of ED presentation, history of previous IBD-related surgery, investigations undertaken in the ED, specialist consultations requested in the ED, and treatments initiated in the ED. IBD-specific complaints included any of abdominal pain, nausea, vomiting, diarrhea or other bowel movement changes, gastrointestinal (GI) bleeding, and fistula related issues for persons with Crohn's disease. For those not hospitalized from the ED, discharge information regarding follow-up or medication alterations was recorded.

Analyses

Categorical variables were compared with chi square and Fisher's exact (for 2×2 tables) and logistic regression analysis was undertaken to assess predictors of follow-up with a gastroenterologist post-ED visit. The covariates for the regression analysis were chosen if they showed at least marginal ($P < 0.1$) relationship with the dependent variable when considered singly or they had been predictive in other studies. The variables that were included were age (less than or more than 50), sex, IBD duration (less than or more than 10 years), IBD diagnosis, use of IBD medications prior to ED presentation (yes or no), prior surgery (yes or no), consultation with gastroenterology in the ED (yes or no), consultation with a GI surgeon in the ED (yes or no), and hospital facility being teaching hospital versus community hospital. SAS 9.4 was used for all statistical analyses.

Results

One thousand four hundred and seventy-eight charts were reviewed and of these, 1385 persons had a medical encounter with an ED physician (Figure 1). Of these, 1275 were persons with IBD with a first visit to the ED for their IBD during the period of the study. In 108 of the 110 exclusions, a previous ED encounter had already been reviewed. In two cases, the chart review did not identify whether the visit was IBD related. Five hundred and twenty-three (41%) of the visits were for IBD-specific complaints. Of these IBD-specific visits, 196 IBD patients were admitted to the hospital after their ED visit,

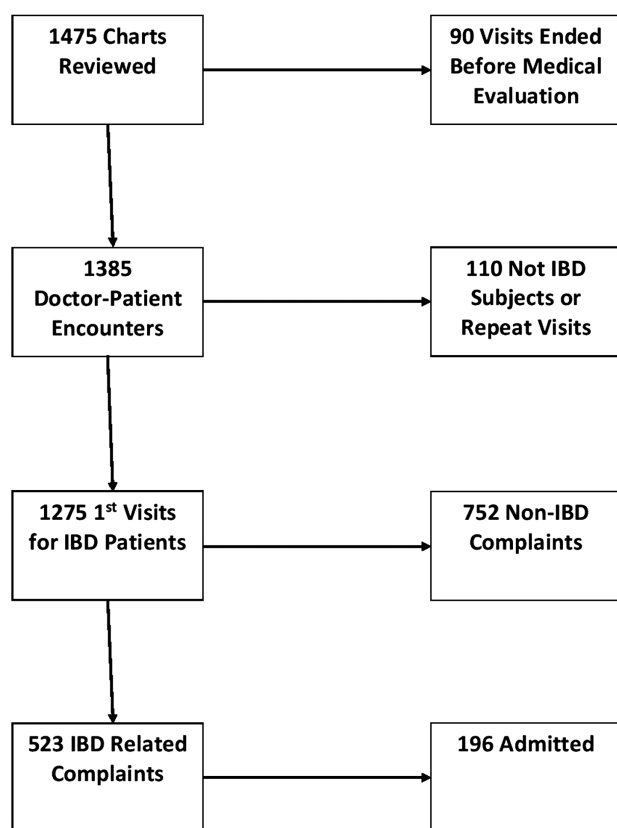


Figure 1. Flow chart of chart review.

leaving 327 (62.5%) who were discharged from the ED. These 327 persons had a total of 1713 ED visits over the course of the study period, however, only the initial visits were reviewed in detail. Among all persons with IBD presenting to the ED they were more likely to have CD and were only slightly more likely to be female (Table 1). Approximately 40% of all IBD patients had a prior IBD surgery and nearly 80% had an identified GI specialist (either gastroenterologist or GI surgeon) involved in their care. Of the 327 patients who were discharged from the ED, 189 (58%) had CD and 138 (42%) had UC. The phenotype distribution was as expected, although it was not available for a substantial number of patients (Table 2). Nearly all patients had prior care at some time from a GI specialist. Where it was recorded, approximately half of the IBD patients had been seen by their GI specialist within the prior year; however, this was most often not recorded. Approximately 50% of IBD patients were not using IBD-specific medications at the time of their ED visit. Prednisone was used by 9% and anti-TNF was used by 11% of the cohort.

Testing and Consultation in the ED

Complete blood counts were routinely ordered; however, serum albumin was often not ordered and serum C-reactive protein (CRP) was rarely ordered (Table 2). Nearly one quarter of persons had a computerized tomography (CT) of the abdomen. There was a trend for more persons with CD than UC to have had a CT of the abdomen ordered. Endoscopy, abdominal ultrasound and MRI were rarely obtained. In approximately one third of patients, a specialist consultation was obtained. A gastroenterologist was consulted approximately 20% of the time.

Discharge Outcomes

Follow-up with a gastroenterologist was only arranged from the ED in 36%. For those who saw a gastroenterologist in the ED as opposed to those who did not, there was significantly more likely to be a management change in medications and significantly more likely to be follow-up arranged with a gastroenterologist (Table 3). For instance, for those seeing a gastroenterologist

Table 1. Characteristics of persons presenting to the ED with IBD-related complaints

	All presenters to the ED	Only those discharged from the ED	Only those admitted	P value
N	523	327	196	
CD	307 (59%)	189 (58%)	118 (60%)	0.65
UC	216 (41%)	138 (42%)	78 (40%)	
Female	283 (54%)	173 (53%)	110 (56%)	0.53
Prior Surgery	213 (41%)	131 (40%)	82 (42%)	0.71
Known GI specialist	387 (79%)	243 (79%)	144 (79%)	0.91

CD, Crohn's disease; ED, Emergency Department; GI, gastrointestinal; UC, ulcerative colitis.

Table 2. Characteristics for those seen in the ED and not admitted

	CD N = 189	UC N = 138	P value
Mean age at IBD diagnosis (SD)	30.3 (15.7)	38.7 (17.1)	0.0001
Mean age at ED presentation (SD)	47 (19.0)	48.8 (18.4)	
Mean disease duration at ED presentation (SD)	14.1 (12.1)	7.8 (9.2)	<0.0001
Phenotype of CD-location			
Ileal	59 (38.3%)		
Colonic	27 (17.5%)		
Ileocolonic	62 (40.3%)		
Upper GI	1 (0.6%)		
Ileal and upper GI	3 (1.9%)		
Colonic and upper GI	2 (1.3%)		
Not available	35		
Phenotype of CD behaviour			
Nonstricturing, nonpenetrating	58 (38.4%)		
Structuring	46 (30.5%)		
Penetrating	36 (23.8%)		
Stricturing and penetrating	11 (7.3%)		
Not available	38		
Perineal disease	28 (14.8%)		
Phenotype of UC			
Proctitis		8 (8.9%)	
Left-sided colitis		21 (23.3%)	
Pancolitis		61 (67.8%)	
Not available		48	
Prior contact for IBD			
Information available, <i>n</i>	171	114	
None	6 (4%)	8 (7%)	0.26
General practitioner	2 (1%)	1 (1%)	1
Gastroenterologist	162 (95%)	92 (81%)	0.0003
GI surgeon	63 (37%)	22 (19%)	0.0015
Not available	18	24	
Median Gap between last contact for IBD and ED presentation (years)			
Within the prior year	30 (48%)	29 (53%)	0.3313
At 1 to 2 years prior	22 (35%)	14 (25%)	
At 2 to 3 years prior	7 (11%)	4 (7%)	
Beyond 3 years prior	4 (6%)	8 (15%)	
Not available	126	83	
Using IBD-specific meds			
Using any IBD medication	98 (52%)	63 (46%)	0.31
5ASA (oral and/or rectal)	32 (33%)	45 (71%)	0.0014
Prednisone	20 (20%)	9 (14%)	0.40
Budesonide	5 (5%)	1 (2%)	0.41
Azathioprine/6-mercaptopurine	36 (37%)	10 (16%)	0.0022
Anti-TNF	31 (32%)	6 (10%)	0.0006
Methotrexate	0	0	
Antibiotics	6 (6%)	4 (6%)	1

Table 2. Continued

	CD N = 189	UC N = 138	P value
Testing in the ED			
CBC measured	174 (92%)	122 (88%)	0.34
Serum albumin measured	95 (50%)	44 (32%)	
Serum CRP measured	10 (5%)	4 (3%)	
Plain Xray	78 (41%)	32 (23%)	0.0009
Type			
Abdomen	69 (88%)	27 (84%)	0.54
Chest	44 (56%)	16 (50%)	0.67
CT scan	49 (26%)	24 (17%)	0.080
Type			
Abdomen	48 (98%)	22 (92%)	0.25
Chest	0	2 (8%)	0.11
Ultrasound	8 (4%)	7 (5%)	0.79
MRI	1 (0.5%)	0	1
Endoscopy			
None	177 (94%)	127 (91%)	0.013
Lower endoscopy	6 (3%)	13 (9%)	
Upper endoscopy	3 (2%)	0	
Both lower and upper endoscopy	2 (1%)	0	
Consultations in the ED	64 (34%)	38 (28%)	0.23
Any Gastroenterologist	39 (21%)	24 (17%)	0.48
GI surgeon	17 (9%)	4 (3%)	0.04
Internal medicine	14 (7%)	9 (7%)	0.83
Other	3 (2%)	4 (3%)	0.46
Own gastroenterologist	4 (2%)	2 (1%)	1

CBC, complete blood count; CD, Crohn's disease; CRP, C-reactive protein; ED, Emergency Department; GI, gastrointestinal; IBD, inflammatory bowel disease; UC, ulcerative colitis.

in consultation, 44% had a new medication started compared to 24% who had not seen a gastroenterologist ($P = 0.0017$). Gastroenterology follow-up was arranged for 79% of those seeing a gastroenterologist in consultation versus 27% of those who did not (Table 3). The only predictor on multivariate analysis of seeing a gastroenterologist in follow-up post-ED visit was having seen a gastroenterologist in the ED in consultation (odds ratio: 14.76; 95% CI: 5.90, 36.91; $P < 0.0001$; Table 4).

Discussion

We are reporting that in a major Canadian urban center, nearly two thirds of patients with IBD who present to an ED are discharged from the ED. Many had multiple ED visits in the 2-year study time period. It is difficult on a retrospective chart review to be able to determine what percentage of those presenting to an ED and discharged required the acuity of service offered in an ED. However,

gastroenterology consultation was requested in only a minority of IBD patients. For persons with a chronic disease such as IBD, and especially in the current era with complex treatment options, it would be appropriate to have a gastroenterologist involved in all visits to the ED by persons with IBD where presenting symptoms or signs could be ascribed to IBD activity. We showed that if gastroenterology consultation was obtained, patients were more likely to have a medical management change and were more likely to see a gastroenterologist in follow-up. If gastroenterology consultation is not available in person, it would be optimal for it to at least to be available by telephone. In any Canadian province, regardless of where the ED is located, gastroenterology consultation should be available by telephone.

Approximately half of the IBD patients were not using an IBD-specific medication at the time of ED presentation. This is not wholly surprising, since we have previously reported in a population-based study, that after 5 years of disease duration approximately 50% of

Table 3. Discharge planning depending on whether a gastroenterology consultation was obtained

	Saw a Gastroenterologist in ED*		P value
	No	Yes	
N	263 (81%)	63 (19%)	
Management Change	17 (7%)	14 (23%)	0.0004
Change to currently used medication dosing			
% yes	6 (2.3%)	8 (12.7%)	0.0015
Any new medications started	63 (24%)	28 (44%)	0.0017
Specific new medication started			
SASA	13 (21%)	7 (25%)	0.78
AZA/6MP/MTX	0 (0%)	2 (7%)	0.092
Anti TNF	0	0	
Budesonide	1 (2%)	2 (7%)	0.22
Prednisone	41 (65%)	22 (79%)	0.23
Antibiotic	10 (16%)	3 (11%)	0.75
Other	4 (6%)	0 (0%)	0.31
New narcotic prescribed	28 (11%)	3 (5%)	0.23
Follow-up with gastroenterologist	70 (27%)	48 (79%)	<.0001
Follow-up with own gastroenterologist	51 (20%)	35 (57%)	<.0001
Follow-up Other Services	10 (4%)	0	

*For 1 record, it was not discernable whether a gastroenterologist had been consulted or not.

Table 4. Multivariate logistic regression analysis of predictors as to whether follow-up with a gastroenterologist was arranged post-ED discharge

Predictor	Odds ratio	95% CI		P
Age at ED visit < 50	1.68	0.86	3.30	0.13
Male vs. Female	1.28	0.69	2.38	0.43
IBD Duration <10 years vs. longer	0.52	0.25	1.11	0.09
CD vs. UC	0.70	0.35	1.40	0.32
On IBD Meds prior to ED visit yes vs. no	0.61	0.33	1.14	0.12
Prior Surgery yes vs. no	0.50	0.23	1.08	0.078
Consult with GI at ED yes vs. no	14.76	5.90	36.91	<0.0001
Consult with Surgeon at ED yes vs. no	0.34	0.09	1.32	0.12
Facility Academic vs. Community	0.74	0.39	1.39	0.34

CD, Crohn's disease; CI, confidence interval; CRP, C-reactive protein; ED, Emergency Department; GI, gastrointestinal; IBD, inflammatory bowel disease; UC, ulcerative colitis.

Manitobans are not using IBD-specific medication (10). In an IBD specialty clinic, we reported that approximately 25% of clinic attendees were not using IBD-specific medications, however, that was considered not appropriate in half of those nonusers (11). Hence, many of the medication nonusers presenting to the ED and even some using IBD-specific medications will leave the ED with a change in IBD-specific medications. However, this should be planned with a consulting gastroenterologist.

Recognizing the increasing complexity of IBD care, gastroenterologist consultation must be available for ED care. Incomplete

follow-up with gastroenterology is not unique to our center as it has been reported that only 40% of IBD patients presenting to the ED at University of California Los Angeles Medical Centre had follow-up with a gastroenterologist post-ED visit (12). Even when we used comprehensive administrative data to track gastroenterology follow-up post-ED visit, we found that only 52% of new IBD cases and 27% of established cases were seen by a gastroenterologist within 1 month following the ED visit; and 72% of new cases and 57% of established cases were seen by a gastroenterologist for an outpatient visit within

1 year following ED discharge (1). The latter visit may or may not have had anything to do with the ED visit. Further, whether gastroenterology follow-up was to occur, post-ED visit should be documented in all ED discharge planning of IBD patients who are in the ED for an IBD-specific reason. Involvement of a gastroenterologist in the ED will increase the likelihood of documented gastroenterology follow-up post-ED discharge, but this is still incomplete. This is an important management gap that needs to be addressed to enhance IBD care. Further, since several patients had subsequent ED visits, it would be important to study in future research whether gastroenterologist or allied health professional involvement could impact on improving outcomes and reducing ED utilization. This may speak to a role for physician extenders like nurse practitioners or physician assistants to participate in urgent care for IBD patients and help coordinate follow-up.

While nearly all IBD patients had blood testing, it is noteworthy that so few patients had a serum CRP measured and another informative test like a serum albumin was often not performed. This suggests that gastroenterologists should better coordinate with EDs to ensure tests which are useful for assessing IBD activity are obtained in the ED. At the time of this study, fecal calprotectin testing was not available but this would be another test that may be useful for assessing whether symptoms are related to active luminal inflammation.

This study is limited by its retrospective nature. It is possible that even when gastroenterology follow-up was not documented in the chart it was arranged verbally, or the patient personally arranged it postdischarge. This would be a documentation deficiency, which also needs to be addressed. However, it is difficult to know retrospectively how often gastroenterology consultation was available. Another limitation of our study is that we do not have long-term follow-up data after the patients' visits, including whether in fact consultation with a gastroenterologist led to improvement in either short-term or long-term care. We have previously shown that patients who see a gastroenterologist in the first year following diagnosis are less likely to require surgery. The association between early gastroenterology care and lower risk for surgery was most evident 2 years after diagnosis (13). Another limitation is that there was considerable missing data for several of the variables we sought. Some aspects of the missing data reflect the hazard of undertaking a retrospective study while some aspects reflect some of the problems identified in this study (i.e., incomplete documentation at ED visits). Further, we chose to evaluate only the first ED visit of each individual, and several individuals had multiple visits. This was in part a practical matter as it would have doubled the chart review required. However, we chose to evaluate the first ED visit available to us since it may have been more involved than other subsequent visits. Finally, our findings may not apply

to rural IBD patients who access rural EDs. IBD care in rural Manitoba in the ED and post-ED may be even more fragmented than in urban hospital settings. We do feel, however, that our findings are likely applicable to other major Canadian urban centres. Through various practice guidelines undertaken under the auspices of the Canadian Association of Gastroenterology as well as through epidemiological research undertaken by the Canadian Gastroenterology Epidemiology Consortium, it is apparent that the practice of managing IBD across the country, at least by IBD experts, is fairly uniform. Nonetheless, we do not have data regarding ED use by persons with IBD in other Canadian provinces and such studies are warranted.

While there is the potential to develop other approaches to deal with IBD patients with acute issues, it is likely that EDs will continue to have a prominent role (2,4,14). First, many are open around the clock, so patients can get care at all hours. For those who have a gastroenterologist, they sometimes feel they cannot expeditiously access that care (4); others may have lost contact with a gastroenterologist or even primary care provider. Hence, gastroenterologists and ED physicians need to get together on mapping an optimal strategy for when IBD patients present to the ED. Gastroenterologists need to be available for at least telephone consultation and need to coordinate with ED physicians about what testing would be most helpful. ED physicians have written on the importance of coordination of care with specialists on treatment plans and offering patients resources for ongoing support (15). ED physicians should document specific post-ED follow-up plans and endeavour to arrange gastroenterology follow-up. New medications were initiated in the absence of gastroenterology consultation one quarter of the time and without documented follow-up plans which leaves a management gap. Additional studies are required to determine which patients can be managed in a non-ED outpatient setting and also on optimizing outcomes from ED visits that culminate in ED discharge.

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References

1. Nugent Z, Singh H, Targownik LE, et al. Predictors of emergency department use by persons with inflammatory bowel diseases: A population-based Study. *Inflamm Bowel Dis* 2016;22(12):2907–16.
2. Terlizzi EP, Dahlhamer J, Ji A. Percentage of adults aged ≥ 18 years who had visited an emergency department at least once in the past 12 months, by age group and Inflammatory Bowel Disease (IBD) status — National Health Interview Survey, 2015 and 2016. *MMWR Morb Mortal Wkly Rep*. 2019;68(8):207.
3. Gajendran M, Umapathy C, Loganathan P, et al. Analysis of hospital-based emergency department visits for inflammatory bowel disease in the USA. *Dig Dis Sci* 2016;61(2):389–99.
4. Pant C, Deshpande A, Fraga-Lovejoy C, et al. Emergency department visits related to inflammatory bowel disease: Results from nationwide emergency department sample. *J Pediatr Gastroenterol Nutr* 2015;61(3):282–4.
5. Ballou S, Hirsch W, Singh P, et al. Emergency department utilisation for inflammatory bowel disease in the United States from 2006 to 2014. *Aliment Pharmacol Ther* 2018;47(7):913–21.
6. Bernstein MT, Walker JR, Chhibba T, et al. Health care services in IBD: Factors associated with service utilization and preferences for service options for routine and urgent care. *Inflamm Bowel Dis* 2017;23(9):1461–9.
7. Bernstein CN, Benchimol EI, Bitton A, et al. The impact of inflammatory bowel disease in Canada 2018: Extra-intestinal diseases in IBD. *J Can Assoc Gastroenterol* 2019;2(Suppl 1):73–80.
8. Schoenfeld R, Nguyen G, Bernstein CN. Integrated care models: optimizing adult ambulatory care in inflammatory bowel disease. *J Can Assoc Gastroenterol* 2019; in press.
9. Bernstein CN, Blanchard JF, Rawsthorne P, Wajda A. Epidemiology of Crohn's disease and ulcerative colitis in a central Canadian province: A population-based study. *Am J Epidemiol* 1999;149:916–24.
10. Melesse DY, Targownik LE, Singh H, et al. Patterns and predictors of long-term nonuse of medical therapy among persons with inflammatory bowel disease. *Inflamm Bowel Dis* 2015;21(7):1615–22.
11. Bhasin S, Singh H, Targownik LE, et al. Rates and reasons for nonuse of prescription medication for inflammatory bowel disease in a referral clinic. *Inflamm Bowel Dis* 2016;22(4):919–24.
12. Vu M, Phan J, Ha C. Emergency department healthcare utilization among IBD patients at an academic tertiary care IBD referral center. *Gastroenterology* 2016;150:S799–800 (abstract).
13. Nguyen GC, Nugent Z, Shaw S, et al. Outcomes of patients with Crohn's disease improved from 1988 to 2008 and were associated with increased specialist care. *Gastroenterology* 2011;141(1):90–7.
14. Ananthakrishnan AN, McGinley EL, Saeian K, Binion DG. Trends in ambulatory and emergency room visits for inflammatory bowel diseases in the United States: 1994 – 2005. *Am J Gastroenterol* 2010;105:363–70.
15. Burg MD, Riccoboni ST. Management of inflammatory bowel disease flares in the emergency department. *Emerg Med Pract* 2017;19(11):1–20.