Published in final edited form as:
Med Health R I. 2012 January ; 95(1): 4–8.

Evaluation of Possible Inflammatory Bowel Disease: A Survey of Rhode Island Physicians

Sumona Saha, M.D.[*],
Assistant Professor of Medicine, Division of Gastroenterology and Hepatology, University of Wisconsin School of Medicine and Public Health, UW Medical Foundation Centennial Building, 1685 Highland Avenue, Room 4224, Madison, WI 53705, Phone: (608) 263-1995, Fax: (608) 265-5677

Manuel Lam, M.D.[*],
Resident in Internal Medicine, Stanford University Hospital & Clinics, 300 Pasteur Drive, Grant S101, Stanford, CA 94305-5109, Phone: 650.723.6961, Fax: 650.725.8418

Erica Roberson, M.D., M.S.,
Gastroenterology Fellow, Division of Gastroenterology, Oregon Health & Science University, 3181 SW Sam Jackson Park Road L461, Portland, OR 97239-3098, Phone: (503) 494-2270, Fax: (503) 494-8776

Samir Shah, M.D.,
Clinical Associate Professor of Medicine, Warren Alpert Medical School of Brown University, Gastroenterology Associates, 44 West River Street, Providence, RI 02904, Phone: 401-274-4800, Fax: 401-454-0410

Neal S. LeLeiko, M.D., Ph.D.,
Professor of Pediatrics, Warren Alpert Medical School of Brown University, Hasbro Children's Hospital, Rhode Island Hospital, 593 Eddy Street, MPH 138, Providence, RI 02903, Phone: (401) 444-4917, Fax: (401) 444-8748

Sheldon Lidofsky, M.D.,
Clinical Assistant Professor of Medicine, Warren Alpert Medical School of Brown University, University Gastroenterology, 33 Staniford Street, Providence, RI 02905, Phone: 401-421-8800, Fax: 401-751-4029

Renee Bright, M.S.,
Research Supervisor, Rhode Island Hospital, Department of Gastroenterology, Providence, RI 02903, Phone: 401-444-4143, Fax: 404-444-4283

Nicole Flowers, M.D, M.P.H.,
Division of Adult and Community Health, Centers for Disease Control and Prevention, 4770 Buford Highway NE, Mailstop K-67, Atlanta, GA 30341, Phone: 770-730-9179, Fax: 770-488-5965

Marjorie Merrick, M.A., and
Vice President of Research and Scientific Programs, Crohn's & Colitis Foundation of America, 386 Park Avenue South - 17th floor, New York, NY 10016, Phone: 646-943-7484, Fax: (212) 679-3567

Bruce E. Sands, M.D., M.S.

Correspondence to: Bruce E. Sands, bruce.sands@mssm.edu.
[*]Equal contribution

Professor of Medicine, Mount Sinai School of Medicine, One Gustave L. Levy Place, Box 1069, New York, NY 10029, Phone: 212-241-6744, Fax: 212-241-5142

Sumona Saha: ssaha@medicine.wisc.edu; Manuel Lam: manuel.lam@stanford.edu; Erica Roberson: robersoe@ohsu.edu; Samir Shah: samirs@brown.edu; Neal S. LeLeiko: neal_leleiko@Brown.edu; Sheldon Lidofsky: Sheldon_Lidofsky@brown.edu; Renee Bright: rbright@lifespan.org; Nicole Flowers: ndf0@cdc.gov; Marjorie Merrick: mmerrick@ccfa.org; Bruce E. Sands: bruce.sands@mssm.edu

Abstract

Background—Patients with undiagnosed inflammatory bowel disease (IBD) are often evaluated initially by primary care physicians (PCPs). Despite the frequency with which PCPs evaluate chronic abdominal pain and chronic diarrhea, little is known about how they approach these symptoms.

Objectives—To determine the diagnostic practices and referral patterns of PCPs when confronting a patient with potential IBD.

Methods—We conducted a mail survey of PCPs practicing in Rhode Island. Clinical vignettes describing patients with chronic abdominal pain and chronic diarrhea were presented. Respondents were asked to indicate how they would evaluate these scenarios and when they would refer to a specialist.

Results—432 PCPs were surveyed; 35.6% responded. Wide variation in PCPs' definitions of chronic abdominal pain and chronic diarrhea was found, with only 26% and 51 % of physicians, respectively, defining these symptoms to be chronic per standard definitions. Laboratory testing was found to vary significantly with practice type ($p<0.01$ for 2 patient groups). Patient age influenced the ordering of diagnostic imaging ($p<0.0001$), while patient gender did not.

Conclusions—There is significant variability among PCPs in the threshold after which common gastrointestinal symptoms become chronic as well as in their diagnostic evaluation of these symptoms. This variability may lead to a lag in the diagnosis of IBD and influence patient outcomes.

Introduction

The inflammatory bowel diseases (IBD), Crohn's disease (CD) and ulcerative colitis (UC), cause significant morbidity to patients of all ages. Abdominal pain and diarrhea are common in patients with IBD, but also occur in non-inflammatory conditions of the gastrointestinal (GI) tract such as irritable bowel syndrome (IBS). As the initial presentation of IBD may be protean, a prolonged delay in diagnosis has been described.[1] Patients with undiagnosed IBD particularly those with non-acute symptoms are often first evaluated by their primary care physician (PCP). Therefore, PCPs are often in the position of deciding if and when patients with non-specific GI symptoms require referral to a specialist.

Despite the frequency with which abdominal pain and diarrhea are encountered in the primary care setting[2], little is known about how physicians approach these problems. Understanding the diagnostic decisions of PCPs in the evaluation of these common GI symptoms is important to determine whether they are taking the appropriate steps to differentiate IBD from other conditions and making timely referrals for definitive diagnosis.

We surveyed PCPs to understand how they evaluate common GI symptoms. We hypothesized that patient and physician characteristics influence the diagnostic evaluation of possible IBD.

Methods

Participants

This survey was conducted, in part, to validate information about referral patterns of IBD in Rhode Island (RI) as part of the Ocean State Crohn's and Colitis Area Registry. A mailing list of all physicians in RI was obtained through the American Medical Association. Internists, family practitioners, pediatricians and obstetrician/gynecologists (Ob/Gyns) comprised our sampling frame. As a practical consideration 25% of PCPs were randomly selected for inclusion. Non-responders were contacted with two additional mailings. A five-dollar gift card was included in the first mailing.

This study was approved by the Institutional Review Boards at Lifespan/RI Hospital and at Massachusetts General Hospital.

Survey instrument

Physicians were mailed a 5-page, 26-item questionnaire in March 2008. Survey items included demographic information, questions pertaining to 2 clinical vignettes, and questions assessing the importance of various factors in the choice of specialist referral. Content and face validity were established by 2 gastroenterologists and 4 PCPs, respectively.

The vignettes described hypothetical patients presenting with chronic lower abdominal pain (vignette 1) and chronic diarrhea (vignette 2). The duration of symptoms was not provided. After reading the vignettes, respondents were asked to specify the duration at which they consider the presenting symptom to be chronic. They were then asked to select the diagnostic tests they would order if the patient were a 10 year-old child, 30 year-old male, or 30 year-old female. Respondents were also asked about their likelihood of referring the patient to a specialist if their clinical evaluation suggested IBS or IBD using a 7-point Likert scale (from 1=very likely to refer to 7=very unlikely to refer). Lastly, respondents were asked to determine the importance of various factors when choosing a specialist using a 5-point Likert scale (from 1=strongly agree to 5=strongly disagree).

Statistical Analysis

All analyses were performed using SAS 9.2. Descriptive statistics were calculated for demographic characteristics. Separate analyses were performed for the 2 vignettes. Analyses for the pediatric patient were limited to pediatricians and family practitioners. Internists and family practitioners were used for the analyses for both the adult patients; Ob/Gyns were added to the analysis of the adult female. Bivariate analyses were conducted using number of laboratory tests as the dependent variable. Independent variables included characteristics of the physician. Characteristics were regarded as significant if $p < 0.05$. To determine if physician type predicted number of laboratory tests ordered for the 30 year-old female vignette, a one-way Analysis of Variance was conducted. For the pediatric and adult male patient, as only two types of physicians were used in each of these models, simple t-tests were performed.

Results

Survey respondents

We identified 4,004 physicians practicing in RI, of whom 1,736 met our definition of PCP. Four hundred thirty-two (25%) PCPs were randomly selected for participation. Surveys were returned by 154 physicians for a response rate of 35.6%. Internists comprised 41.6% of respondents, followed by family practitioners (21.9%) and Ob/Gyns (11.7%). One hundred

and thirty-seven survey responses were included in the analysis. Reasons for exclusion in the analysis were: respondent retired or not in clinical practice (n=3), respondent deceased (n=1), respondent did not meet definition of PCP (n=8), survey less than 50% complete (n=3), respondent's practice no longer in RI (n=2). Demographic characteristics of the survey respondents are summarized in Table 1.

Definition of Chronic Abdominal Pain and Chronic Diarrhea

There was wide variation in the duration of symptoms respondents considered necessary for a patient to have chronic abdominal pain or chronic diarrhea. With regards to abdominal pain, only 26% of physicians responded that abdominal pain is chronic once it is greater than 3 months in duration. Fifty-six percent reported that pain lasting less than 3 months is chronic and 21% reported that pain is chronic after 4 months (Figure 1). The definition of chronic abdominal pain was significantly associated with provider type with Ob/Gyns defining abdominal pain as chronic only after it was present for >5–6 months, longer than any other practice type surveyed ($p<0.001$).

With regards to diarrhea, 51% of physicians defined diarrhea as chronic when it lasts greater than 1 month while 41% responded that diarrhea must last greater than 2 months before it is chronic and 8% said that diarrhea lasting less than 1 month is chronic (Figure 2).

Diagnostic Testing by Patient Age and Gender

We found no difference in the mean number of laboratory tests ordered by PCPs when approaching the various patients with either abdominal pain or diarrhea.

With regards to imaging, physicians were less likely to order fluoroscopic studies or computerized tomography (CT) for a child with chronic abdominal pain ($p<0.001$) or chronic diarrhea ($p=0.01$) than for adults. However, they were more likely to order abdominal ultrasounds or x-rays for a child with abdominal pain than for adult patients of either gender ($p<0.001$ for both) (Table 2).

Diagnostic Testing by Provider Type

We found the number of laboratory tests ordered to vary significantly by physician type but not by physician gender, age, ethnicity, race, or year of graduation from medical school (Tables 3 and 4). Pediatricians ordered more laboratory tests than family practitioners for the child with chronic abdominal pain ($p=0.004$) and chronic diarrhea ($p=0.04$). In the evaluation of chronic abdominal pain or diarrhea in the adult female, internists ordered significantly more tests than family practitioners who in turn ordered more tests than Ob/Gyns ($p=0.003$ for abdominal pain; $p=0.004$ for diarrhea). Similarly, internists ordered more tests than family practitioners for the adult male with chronic abdominal pain or diarrhea although the difference was not significant.

Referral Patterns

PCPs reported a greater likelihood of referring patients with suspected IBD (median Likert score=1, very likely to refer) to a specialist compared with those with suspected IBS (median Likert score=3, somewhat likely to refer).

We found no significant difference among the patient groups or physician types when comparing the likelihood to refer for suspected IBD.

Factors influencing choice of specialist

Prior experience with the physician was found to be the most important factor in choosing a specialist. Least important was the practice setting of the specialist (i.e. free-standing office versus hospital-based office).

Discussion

Abdominal pain and diarrhea are the leading GI symptoms for which patients are seen in outpatient clinics in the United States.[3] These symptoms are also the most common presenting symptoms of IBD.[4] Given that they are also associated with many non-inflammatory GI conditions it is critical that PCPs be able to identify the subset of patients who may have IBD and perform timely referral for definitive diagnosis.

Current estimates for the diagnostic lag in children with IBD are 7.1 months for those with CD (with greater lag time in patients with small bowel disease only), 6.7 months for those with UC, and 14 months for patients with indeterminate colitis.[5] For adults, diagnostic lag is longer. Wagtmans et al. found the time to diagnosis from onset of symptoms in patients with CD was 1.9 years[6] while the Manitoba IBD Cohort Study reported a mean lag time of 11 years (range 3–48 years).[1] Shorter lag times presumably allow for earlier initiation of therapy which may in turn improve health-related quality of life and reduce morbidity.

In this study we used clinical vignettes to determine how PCPs approach patients with possible IBD. We found significant variability in the duration of time after which PCPs consider abdominal pain and diarrhea to be chronic. As the differential diagnoses for each symptom differs based upon duration, wherein IBD is more likely to be considered when symptoms are chronic, this variability may be clinically relevant.

Chronic abdominal pain has not been well defined in adults; however, the definition used in pediatrics over the last 40 years is pain which occurs continuously or intermittently for more than 3 months.[7] This definition has been accepted by the American Academy of Pediatrics and the North American Society for Pediatric Gastroenterology, Hepatoogy, and Nutrition.[8] Among our respondents, only 26% considered pain to become chronic at this point. Twenty-one percent answered that pain must last longer to be chronic. Likewise, chronic diarrhea is defined as the production of loose stools for more than 4 weeks.[9] Only half of the respondents (51%) defined chronic diarrhea according to this criterion; 41% answered that diarrhea is not chronic until it lasts more than 2 months. These higher thresholds held by many PCPs may account for some of the delay in diagnosis reported in patients with IBD.

We asked respondents to choose which laboratory and imaging studies they would obtain if the patient presented in the vignettes were a child, adult male, or adult female. Surprisingly, we found no difference in the mean number of laboratory tests ordered for these three demographic categories. Differences in imaging were found, however, with fewer fluoroscopic studies and CT scans ordered for the pediatric patient compared with the adult patients. This difference likely reflects a greater tendency for physicians to minimize radiation exposure in children compared to adult patients. However, as 25% of patients with IBD are diagnosed before age 16, it is important for PCPs to do the appropriate work-up for IBD in children presenting with symptoms of IBD.[10]

When we evaluated the number of tests ordered by physician characteristics, we found only provider type to be significantly associated. In particular, we found that family practitioners ordered significantly fewer tests than pediatricians for the work-up of the 10 year-old child and fewer tests than internists for the work-up of the adult male and female patients. These findings are consistent with prior studies which have shown that even after adjusting for

patient case-mix that family practitioners and general internists have statistically significant differences in their resource utilization with internists tending to use more resources.[11] Further data are needed to determine whether patients with undiagnosed IBD experience different outcomes depending on their PCP's specialty.

We found that PCPs with a high suspicion for IBD were very likely to refer to a specialist but only somewhat likely to refer a patient with suspected IBS. While this difference may reflect a higher level of comfort among PCPs in the diagnosis of IBS, it raises the possibility that patients with IBD who present with IBS-like symptoms may not undergo timely referral. This hypothesis is bolstered by the fact that IBS is widely misunderstood and that despite published algorithms for diagnosis, physician patterns in the evaluation of IBS differ significantly. A study of family practitioners, for example, found that only 14% understood the Rome I criteria, while another study found that just 35% knew that the Manning, Rome and Rome II criteria are used to diagnose IBS.[12,13] In addition, only 49% could identify a group of symptoms typical of IBS.

Carrying a diagnosis of IBS has implications for later diagnosis of IBD. The Manitoba IBD Cohort Study found that patients diagnosed with IBS were more likely to experience longer symptom duration before diagnosis of IBD than those without IBS. In addition, the relative risk of detecting IBD in patients initially diagnosed with IBS has been found to be 16-fold higher compared to age-matched controls without IBS.[13] These findings may reflect an initial misdiagnosis of IBS and argues for a lower threshold for referral among PCPs when the evaluation suggests IBS, especially when established diagnostic criteria are not met.

There are several limitations to this study. First, our study uses clinical vignettes to assess diagnostic practices. Although the vignettes were designed to represent real world scenarios, they are hypothetical cases. Responses to the vignettes, therefore, may not accurately reflect actual physician practices. In addition, our survey represents PCP diagnostic practices from a single state which limits its generalizability. Our response rate of 35.6%, while comparable to the response rate reported in other mail survey studies of physicians,[14,15] raises the possibility of non-response bias.. Lastly, our study does not allow for correlation between ordering practices and patient outcomes. We found that physician type predicts the number of tests and imaging studies; however, we were unable to assess if patients of the high-ordering providers have different outcomes than patients of the low-ordering providers.

Conclusions

Given the significant time lag between symptom presentation and diagnosis in patients with IBD it is important to document the diagnostic practices of PCPs in the evaluation of its common presenting symptoms. We found wide variation in the duration of symptoms that PCPs consider necessary in order for abdominal pain and diarrhea to be chronic. This may influence their inclusion of IBD on their differential diagnoses. We also found significant variation in the number of laboratory tests ordered by provider type and the number of radiographic studies ordered by patient type. These differences may lead to variability in time to diagnosis with patients of certain provider types more or less likely to be diagnosed in a timely fashion.

Acknowledgments

Funding Support:

This project was supported by a grant from the Crohn's and Colitis Foundation of America through the Centers for Disease Control and Prevention (1 UO1 DP000340-03) and the National Institutes of Health (1R21DK078555-01). Manuel Lam, M.D. was supported by a Doris Duke Clinical Research Fellowship at Harvard Medical School.

Sumona Saha, M.D. was supported by Award Number K12HD055894 from the Eunice Kennedy Shriver National Institute of Child Health and Human Development.

References

1. Burgmann T, Clara I, Graff L, et al. The Manitoba Inflammatory Bowel Disease Cohort Study: prolonged symptoms before diagnosis--how much is irritable bowel syndrome? Clin Gastroenterol Hepatol. 2006; 4:614–620. [PubMed: 16630762]
2. Hing E, Hall MJ, Ashman JJ, Xu J. National Hospital Ambulatory Medical Care Survey: 2007 Outpatient Department Summary. National health statistics reports. 2010; 28:1–32. [PubMed: 20942378]
3. Russo MW, Wei JT, Thiny MT, et al. Digestive and Liver Statistics, 2004. Gastroenterology. 2004; 126:1448–1453. [PubMed: 15131804]
4. Wagtmans MJ, Verspaget HW, Lamers CBHW, et al. Am J Gastroenterol. 2001; 96:1541–1546. [PubMed: 11374696]
5. Heikenen JB, Werlin SL, Brown CW, et al. Presenting symptoms and diagnostic lag in children with inflammatory bowel disease. Inflamm Bowel Dis. 1999; 5:158–160. [PubMed: 10453370]
6. Wagtmans MJ, Verspaget HW, Lamers CBHW, et al. Am J Gastroenterol. 2001; 96:1541–1546. [PubMed: 11374696]
7. Apley J. The child with recurrent abdominal pain. Pediatr Clin North Am. 1967; 14:63–72. [PubMed: 6016075]
8. American Academy of Pediatrics, Subcommittee on Chronic Abdominal Pain. Chronic abdominal pain in children. Pediatrics. 2005; 115 (3):812– 815. [PubMed: 15741394]
9. Fine LD, Schiller LR. American Gastroenterological Association medical position statement: guidelines for the evaluation and management of chronic diarrhea. Gastroenterology. 1999; 116:1461–1463. [PubMed: 10348831]
10. Baldassano RN, Piccoli DA. Inflammatory bowel disease in pediatric and adolescent patients. Gastroenterol Clin North Am. 1999; 28:445–458. [PubMed: 10372276]
11. Greenfield S, Nelson EC, Zubakoff M, et al. Variations in resource utilization among medical specialties and systems of care. JAMA. 1992:267–1624.
12. Rosenblatt ML, Roth L, Michaels T, et al. A survey of family practitioners on practice patterns of irritable bowel syndrome. Am J Gastroenterol. 1999; 94:A2685.
13. Longstreth GF, Burchette RJ. Family practitioner's attitudes and knowledge about irritable bowel syndrome. Fam Prac. 2003; 20:670–4.
14. Garcia Rodriguez LA, Ruigomez A, Wallander M-A, et al. Detection of colorectal tumor and inflammatory bowel disease during follow-up of patients with initial diagnosis of irritable bowel syndrome. Scand J Gastroenterol. 2000; 35:306–11. [PubMed: 10766326]
15. Martin, B. Don't survey physicians!. Chicago, IL: Center for Health Services Research and Development, American Medical Association; 1974.
16. Shosteck H, Fairweather WR. Physician response rates to mail and personal interview surveys. Public Opinion Q. 1979; 43:206–217.

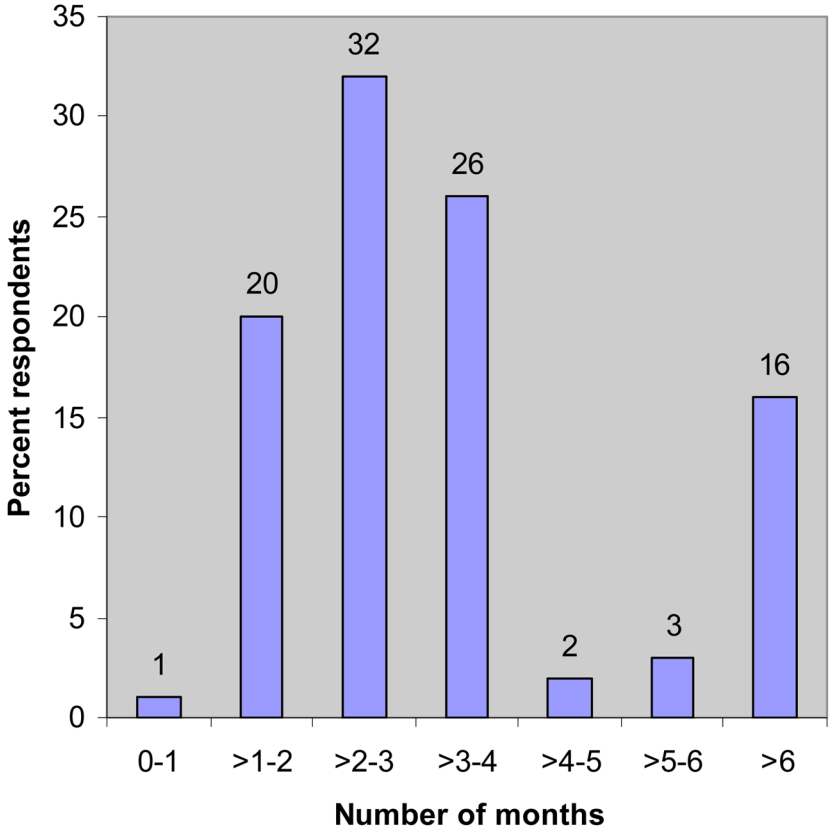

Figure 1.
Survey response: after how many months would you consider abdominal pain to be *chronic*?

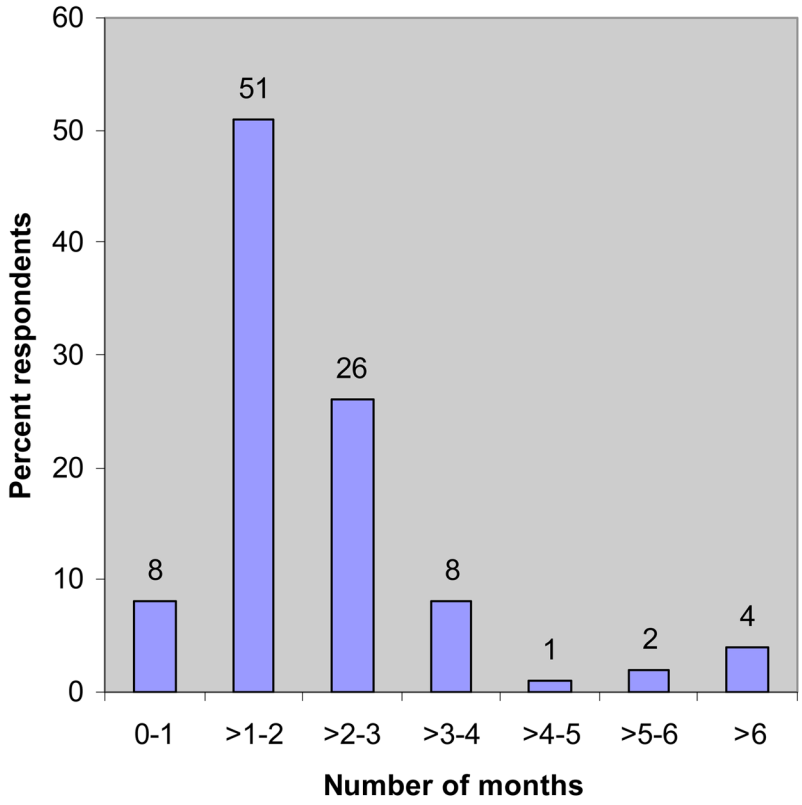

Figure 2.
Survey response: after how many months would you consider diarrhea to be *chronic*?

Table 1

Demographic Characteristics of Respondents

Characteristic	
Age (mean years, range)	45.0 (26 to 74)
Years since graduation from medical school (median, range)	18 (1 to 57)
Characteristic	**N (%)**
Gender	
• Male	66 (49.2)
• Female	71 (51.8)
Race	
• White	122 (89.7)
• Asian	7 (5.1)
• African-American	3 (2.2)
• Other	4 (2.9)
Practice Type	
• Internal Medicine	57 (41.6)
• Family Practice	30 (21.9)
• Ob/Gyn	16 (11.7)
• Pediatrics	32 (23.3)
• Other	2 (1.4)
Practice Setting	
• Hospital based	42 (30.7)
• Community based	85 (62.0)
• Other	10 (7.2)

Table 2

Diagnostic testing by patient age and gender

	10 year-old child	30 year-old male	30 year-old female	p-value
	Mean (SD)			
Labs for chronic abdominal pain	7.6 (3.9)	7.9 (4.1)	7.8(4.2)	NS
Labs for chronic diarrhea	9.4 (3.6)	10.3 (4.5)	7.9 (4.1)	NS
Radiographic exam for chronic abdominal pain				
• SBFT, BE, or CT abdomen	0.16 (0.41)	0.70 (0.60)	0.63 (0.61)	<0.01
• Abdominal ultrasound or AXR	0.88 (0.74)	0.52 (0.69)	0.22 (0.56)	<0.01
• MRI abdomen	0 (0)	0.02 (0.16)	0.02 (0.14)	NS
Radiographic exam for chronic diarrhea				
• SBFT, BE, or CT abdomen	0.14 (0.40)	0.35 (0.55)	0.34(0.55)	0.04
• Abdominal ultrasound or AXR	0.23 (0.47)	0.25 (0.60)	0.22 (0.56)	NS
• MRI abdomen	0 (0)	0.10 (0.11)	0.01 (0.10)	NS

SBFT=small bowel follow through; BE=barium enema; CT=computed tomography; AXR=abdominal x-ray; MRI=magnetic resonance imaging

Table 3

Diagnostic testing for chronic abdominal pain by provider type

Practice type	Mean number of labs (SD)		
	10 year-old child	30 year-old male	30 year-old female
Family Practice	6.0 (3.9)	7.6 (4.1)	7.8 (4.0)
Internal Medicine	N/A	8.1 (4.1)	8.6 (4.1)
Ob/Gyn	N/A	N/A	4.6 (3.6)
Pediatrics	8.6 (4.2)	N/A	N/A
p-value	0.004	0.58	0.004 *

* p-value is for ANOVA test for the three practice types (i.e. Family Practice, Internal Medicine, and Ob/Gyn)

Table 4

Diagnostic testing for chronic diarrhea by provider type

Practice type	Mean number of labs (SD)		
	10 year-old child	30 year-old male	30 year-old female
Family Practice	8.6 (4.2)	9.1 (4.3)	9.1 (4.3)
Internal Medicine	N/A	11.0 (4.5)	11.3 (4.2)
Ob/Gyn	N/A	N/A	7.3 (4.5)
Pediatrics	10.1 (3.0)	N/A	N/A
p-value	0.04	0.22	0.003 *

* p-value is for ANOVA test for the three practice types (i.e. Family Practice, Internal Medicine, and Ob/Gyn)