

Documented Compliance with Inflammatory Bowel Disease Quality Measures Is Poor

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Abstract

Background and Aims Quality metrics allows health care to be standardized and monitored. The American Gastroenterological Association (AGA) established quality metrics for inflammatory bowel disease (IBD) in 2011, but compliance is unknown.

Methods Patients with IBD seen in the gastroenterology clinics at a tertiary care medical center during April 2013 were included. Charts were reviewed for the current state of compliance with the publicized AGA measures over the prior 12 months. Records were assessed for type of IBD, year of diagnosis, number of medications, comorbidities,

hospitalizations and gastroenterology clinic visits in the last year, presence of primary care physician (PCP) at the institution, and involvement of a specialist in IBD or a trainee. Univariate and multivariate logistic regression analyses were done using SPSS.

Results Only 6.5 % (24/367) of patients had all applicable core measures documented. In univariate analysis, year of IBD diagnosis ($p = 0.014$), number of comorbidities ($p = 0.024$), seen by a specialist in IBD ($p = 0.002$), seen by a gastroenterology fellow or resident ($p = 0.034$), and having a PCP at the institution ($p = 0.006$) were significant. In multivariate analysis, seen by a specialist in IBD (5.36, 95 % CI 1.22–23.63, $p = 0.027$), having a PCP at the institution (3.24, 95 % CI 1.23–8.54, $p = 0.018$), and year of IBD diagnosis (0.967, 95 % CI 0.937–0.999, $p = 0.042$) remained significant. Screening for tobacco abuse was the most frequently assessed (96 %, $n = 352/367$) core measure, while pneumococcal immunization (21 %, $n = 76/367$) was the least.

Conclusion Our study demonstrates poor compliance with IBD quality metrics. Additional studies are needed to determine the causes of failure to comply with the quality metrics.

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Abbreviations

ACA	Affordable Care Act
AGA	American Gastroenterological Association
Anti-TNF	Anti-tumor necrosis factor
BIDMC	Beth Israel Deaconess Medical Center
CMS	Centers for Medicare and Medicaid Services
EHR	Electronic health record
IBD	Inflammatory bowel disease

IOM	Institute of Medicine
GI	Gastroenterology
PCP	Primary care physician

Introduction

Over the past decade, the quality of healthcare delivery has been increasingly scrutinized. The Institute of Medicine (IOM) defines quality as, “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge [1].” Quality care is a three-part goal which involves improving individual outcomes, creating a healthier population, and reducing overall costs [2]. To this end, government organizations and medical societies have developed core measures and metrics for multiple diseases to standardize and improve the quality of care. Insurance companies and healthcare organizations have incentivized compliance with quality metrics as well as penalized those failing to provide proof of compliance [3–5]. To help improve compliance with core measures, electronic health record (EHR) systems have been advocated for their ability to trigger alerts regarding specific measures and improve compliance [6, 7].

With the increasing focus on quality metrics and decreasing costs of health care by governmental organizations and insurance companies, the American Gastroenterological Association (AGA) established 10 quality metrics for the care of patients with inflammatory bowel disease (IBD) in 2011 [8]. Eight of these measures relate to outpatient management and two focus on inpatient management.

To date, no study has assessed gastroenterologists’ compliance with the AGA’s current outpatient IBD core measures. We sought to evaluate the current state of compliance with these measures in a large academic faculty practice.

Methods

The 10 AGA IBD core measures were reviewed to determine which were related to the outpatient management of IBD [8]. Two measures, inpatient testing of *Clostridium difficile* infection and inpatient prevention of venous thromboembolism, were excluded from this study. The remaining eight metrics were included in this evaluation (Table 1).

All patients with IBD consecutively seen in the gastroenterology clinics, by general gastroenterologists and

Table 1 Inflammatory bowel disease (IBD) core measures

Measure	Location of care
1: IBD: type, anatomic location and activity all assessed	Outpatient
2: IBD preventive care: corticosteroid sparing therapy	Outpatient
3: IBD preventive care: corticosteroid-related iatrogenic injury—bone loss assessment	Outpatient
4: IBD preventive care: influenza immunization	Outpatient
5: IBD preventive care: pneumococcal immunization	Outpatient
6: Testing for latent tuberculosis before initiating anti-TNF therapy	Outpatient
7: Assessment of hepatitis B virus before initiating anti-TNF therapy	Outpatient
8: Testing for <i>Clostridium difficile</i> —inpatient measure	Inpatient
9: Prophylaxis for venous thromboembolism—inpatient measure	Inpatient
10: IBD preventive care: tobacco user—screening and cessation intervention	Outpatient

specialists in IBD, at a tertiary care medical center (Beth Israel Deaconess Medical Center (BIDMC), Boston, Massachusetts) were included during the month of April 2013. The charts were reviewed during the month of June 2013 after all documentation was completed on patients seen in April. IBD specialists were physicians whose patient panel was only patients with IBD, or majority of their panel were patients with IBD and they were physicians in the Center for Inflammatory Bowel Disease at BIDMC. Our medical center has a complete EHR system with all patient notes, immunization records, orders, laboratory test, imaging, and procedure results in one system. The EHR has alerts to remind physicians to update the EHR with routine health care maintenance, screening for tobacco, medications, past medical history, and allergies which is separate from routine patient note documentation. All physicians use the same EHR at our institution across all specialties and primary care. Vaccinations, however, are not administered in the gastroenterology clinics. Letters are sent to the referring physicians both within BIDMC and outside BIDMC communicating all recommendations after every gastroenterology visit.

The primary outcome was compliance with all applicable core measures since when assessing quality of care, adhering to core measures should be 100 %. To determine compliance with applicable core measures, patients were categorized into one of four groups. Group one included patients who were never exposed to steroids or anti-tumor necrosis factor (anti-TNF) medications. This group had four applicable quality measures (Table 1—measures # 1, 4, 5, and 10). Group two included patients who were previously, but not currently, on corticosteroids and had never

been treated with anti-TNF. This group had five applicable quality measures (# 1, 3, 4, 5, and 10). Group three included patients who were receiving steroids, but were not considering therapy with anti-TNF. This group had six applicable quality measures (# 1, 2, 3, 4, 5, and 10). Group four consisted of patients who were exposed to steroids and anti-TNF was being considered or had been started on an anti-TNF at our institution. This group had 8 applicable measures (# 1, 2, 3, 4, 5, 6, 7, and 10).

Each chart was reviewed by two authors (JJL and JDF). All the gastroenterology notes were reviewed for documentation of compliance with the applicable outpatient IBD core metrics as established by the AGA. Additionally, the EHR immunization tabs and tobacco screening tabs were reviewed for documentation regarding a patient's smoking status and immunization record as recorded by any physician who had contact with the patient. Immunizations and tuberculosis skin testing were only counted if there was a record or some documentation confirming administration. In accordance with the AGA guidelines, all records were assessed from the visit date in April 2013 and the preceding 12 months for any documentation of the AGA IBD core measures except for tuberculosis assessment which was 6 months. Additionally, as per the AGA requirements, documentation of vaccination status was required. Documentation recommending vaccines was not sufficient. Two core measures (# 6 and 7) relate to the initiation of anti-TNF medications. If an anti-TNF was started at the medical center, then the charts were reviewed to determine whether an assessment for latent tuberculosis or hepatitis B was performed prior to initiation of the anti-TNF.

Statistical analysis was performed using SPSS for Windows, Rel. 19.0. 2011. Chicago. SPSS Inc. Continuous variables were compared using Student's *t* test and categorical variables were evaluated using chi-squared or Fisher's exact test as appropriate. Statistical significance was set at a *p* value of < 0.05. Binary logistic regression utilizing backward likelihood ratios with a *p* value of 0.05 for entry and 0.10 for removal was used to identify independent predictors of core measure compliance.

The study was approved by the hospital Institutional Review Board.

Results

Demographics (Table 2)

Three hundred sixty-seven patients with IBD were seen during the month of April 2013. Fifty-four percent (*n* = 199) of patients had Crohn's disease, 43 % (*n* = 159) had ulcerative colitis, and 2.5 % (*n* = 9) were labeled an

Table 2 Patient demographics

Total number of patients (<i>n</i>)	367
Males	145 (40 %)
Females	222 (60 %)
Median age	43 (range 17–88)
Median year of IBD diagnosis	2002 (range 1945–2013)
Ulcerative colitis	159 (43 %)
Crohn's disease	199 (54 %)
Indeterminate colitis (IBD-u)	9 (2.5 %)
Seen by fellow or residents	163 (44 %)
Attending only	204 (56 %)
Seen by specialist in IBD	232 (63 %)
Primary care physician at same medical center	173 (47 %)
Patients hospitalized in the last year	66 (18 %)
Average number of hospitalizations in last year	0.38 (range 0–15)
Average number of gastroenterology visits in last year	3.23 (range 0–13)
Average number of medications at last gastroenterology visit	8.28 (range 0–35)
Average number of problems on past medical history list	5.9 (range 0–36)

IBD inflammatory bowel disease

Table 3 Core measure compliance

Measures	Yes
1: IBD: type, anatomic location and activity all assessed (<i>n</i> = 367)	70 % (<i>n</i> = 257)
2: IBD preventive care: corticosteroid sparing therapy (<i>n</i> = 204)	81 % (<i>n</i> = 165)
3: IBD preventive care: corticosteroid-related iatrogenic injury—bone loss assessment (<i>n</i> = 285)	32 % (<i>n</i> = 90)
4: IBD preventive care: influenza immunization (<i>n</i> = 367)	34 % (<i>n</i> = 124)
5: IBD preventive care: pneumococcal immunization (<i>n</i> = 367)	21 % (<i>n</i> = 76)
6: Testing for latent tuberculosis before initiating anti-TNF therapy (<i>n</i> = 116)	67 % (<i>n</i> = 78)
7: Assessment of hepatitis B virus before initiating anti-TNF therapy (<i>n</i> = 116)	74 % (<i>n</i> = 86)
10: IBD preventive care: tobacco user—screening and cessation intervention (<i>n</i> = 367)	96 % (<i>N</i> = 352)

IBD inflammatory bowel disease

indeterminate colitis (IBD-u). Sixty percent (*n* = 222) of the patients were female. The median age was 43 (range 17–88) with a median year of IBD diagnosis of 2002 (range 1945–2013). Sixty-three percent (*n* = 232/367) of patients were seen by a physician specializing in IBD and residents or fellows were involved with 44 % (163/367) of the patient visits. Forty-seven percent (173/367) of patients had

Table 4 Univariate analysis of variable predicting compliance with all applicable core measures

	24 Patients with all core measures evaluated	343 Without all measures evaluated	<i>p</i> value	95 % Confidence interval
Mean age	50	45.9	0.207	4.58 (−2.54 to 11.69)
Year of disease diagnosis	1993	1999	0.014	−6.42 (−11.51 to −1.33)
Type of IBD UC/Crohn's ^a	13/11	146/188	0.396	0.657 (0.286 to 1.51)
Number of medications	10.4	8.1	0.053	2.29 (−0.293 to 4.60)
Number of problems	8.3	5.8	0.024	2.53 (0.338 to 4.73)
Specialist in IBD	22	210	0.002	6.97 (1.61 to 30.11)
Gender (female/male)	12/12	210/133	0.288	1.58 (0.689 to 3.62)
PCP at BIDMC	18	155	0.006	3.62 (1.40 to 9.34)
Number of hospitalizations in past year (mean)	0.54	0.38	0.556	0.867 (−0.389 to 0.562)
Number of GI visits in the past year (mean)	3.63	3.21	0.320	0.665 (−0.052 to 1.38)
Seen by GI fellow	8	193	0.034	0.39 (0.162 to 0.932)

GI gastroenterology, PCP primary care physician, UC ulcerative colitis

^a For statistical analysis, the 9 patients with IBD-U were excluded

their primary care physician at the same institution as their gastroenterologist. When categorized by group, 68 patients were in group 1, 80 in group 2, 103 in group 3, and 116 in group 4.

Individual Core Measure Compliance (Table 3)

Screening for tobacco abuse was the most commonly assessed (96 %, $n = 352/367$) core measure. In contrast, the most infrequently assessed core measure was pneumococcal immunization (21 %, $n = 76/367$) followed by assessment of bone loss (32 %, $n = 90/285$) and influenza immunization (34 %, $n = 124/367$).

Overall Core Measures Compliance (Tables 4, 5)

Only 6.5 % ($n = 24/367$) of patients had all applicable core measures evaluated and documented (Supplementary Table 1). In univariate analysis of predictors of documentation of all applicable core measures, the year of IBD diagnosis (−6.42, 95 % CI −11.51 to −1.33, $p = 0.014$), number of comorbidities (2.53, 95 % CI 0.338–4.73, $p = 0.024$), being seen by a specialist in IBD (6.97, 95 % CI 1.61–30.11, $p = 0.002$), being seen by a gastroenterology fellow or resident (0.39, 95 % CI 0.162–0.932, $p = 0.034$), and having a primary care physician at the same institution (3.62, 95 % CI 1.40–9.34, $p = 0.006$) were associated with having all core measures assessed. See Table 4 for all the assessed variables. In multivariate analysis, only being seen by a specialist in IBD (5.23, 95 % CI 1.22–23.63, $p = 0.027$), having a primary care physician at the same institution (3.24, 95 % CI 1.23–8.54,

Table 5 Multivariate analysis of variable predicting compliance with all applicable core measures

	B coefficient	<i>p</i> value (95 % CI)
Specialist in IBD	5.36	0.027 (95 % CI 1.22–23.63)
PCP at BIDMC	3.24	0.018 (95 % CI 1.23–8.54)
Year of disease diagnosis	0.967	0.042 (95 % CI 0.937–0.999)

IBD inflammatory bowel disease, PCP primary care physician

$p = 0.018$), and year of IBD diagnosis (0.967, 95 % CI 0.937–0.999, $p = 0.042$) remained significant (Table 5). There was no difference among the patient subgroups. Each group had similar percentage of patients in whom all applicable core measures were assessed: 6 % ($n = 4/68$) in group 1, 5 % ($n = 4/80$) in group 2, 8 % ($n = 8/103$) in group 3, and 7 % ($n = 8/116$) in group 4.

Discussion

For any quality program to be sustainable, medical professionals must view quality measures as the standard of care and believe that adhering to them improves patient care. McGlynn et al. [9] evaluated compliance with quality measures across a range of specialties and found that approximately 50 % of the recommended quality measures were being followed. They concluded that these deficits in the quality of care placed patients at unnecessary risk [9]. Despite this, 10 years later, our study demonstrates that the majority of outpatient quality measures in IBD are not

adequately documented. The only measure with consistently high compliance was assessment of cigarette smoking. Adherence with this measure is not surprising as it is a key component to the Centers for Medicare and Medicaid Services (CMS) meaningful use and is already tied to reimbursement [5]. Because of this, our EHR system has an alert on every patient to remind treating physicians to assess this measure, which in our study resulted in 96 % compliance rates. In contrast, pneumococcal vaccination (21 % compliance) does not have an alert for patients with IBD. Additionally, when patient charts were reviewed, there were a number of notes that included a record of the vaccination status, but the EHR immunization record was not updated. While we included such documentation as proof of compliance in our study, this may not be sufficient for achieving core measures as assessed by third parties. Proof of documented compliance with quality measures must be readily exported from an EHR to upload to third party websites, which is not easily done through a patient note. Ultimately, to provide and document optimal quality of care, health care providers must be educated regarding quality metrics, standardize documentation to be compliant with quality metrics, and establish means to report these quality metrics via EHR systems.

Similarly, the Affordable Care Act (ACA) instituted value-based payments set to start in 2015 [4]. Value-based payments will determine insurance reimbursement rates for physicians and large medical practices based on their compliance with reported quality measures as documented in their EHR. In gastroenterology, Physician Quality Reporting System (PQRS) measures include colon cancer screening, colonoscopy interval and polyp surveillance, hepatitis C, and IBD [4, 10]. By 2015, failure to comply with these measures will result in a reimbursement deduction of up to 2 % every year from CMS. Compliance with these quality metrics is used as a marker of the overall quality and standard of care provided. With an increasing focus on controlling health care costs and providing excellent quality care, our study indicates that even in a medical center that uses an EHR with alert notifications, significant work will be required to achieve compliance with these measures over the next 2 years.

While appropriate use of EHR may help improve care, clinician knowledge and collaboration is crucial in quality care of chronic diseases. Medicine is an ever changing field with new research continually published. Actively reviewing current literature is important in providing patients with the most current and highest quality care. Choudhry et al. [11] showed that physician experience and years since graduating medical school did not necessarily improve the quality of care. In our study, it is not surprising that when the patient was seen by a specialist in IBD compliance with the core measures was improved. These physicians are more likely up to date with the most current

IBD literature and quality measures. Additionally, given that a number of the measures are standard of care for all patients, such as vaccination for influenza and pneumonia and screening for tobacco abuse, having a primary care at the same institution allows for a more efficient multidisciplinary team and appears to improve the overall quality of patient care. In any complex disease, direct and continual communication between specialists and primary care physician improves patient care [12]. While our study shows that compliance with the quality measures are poor, communication between gastroenterologists and primary care physicians may be a critical step in improving the overall quality of care.

The strengths of our study include its cross-sectional design and that all consecutive patients with IBD were included. Additionally, the practice at Beth Israel Deaconess Medical Center is quite varied. Patients with IBD are seen by all clinical gastroenterologists including specialists in IBD. One limitation of the study is that it was performed at a single academic medical center and only 24 patients had all the AGA measures reported. However, all patients presenting with IBD were included, allowing us to assess compliance by general gastroenterologists as well as specialists in IBD. Another limitation is the generalizability of our findings to the community from our study which was based on patients and physicians seen at a tertiary care medical center. However, as much of this study is based on physician documentation, this should not necessarily be different in other practices.

Conclusion

Our study demonstrated overall poor compliance with the current AGA IBD quality metrics. Further studies are necessary to determine potential causes of failure to follow the IBD quality measures. Improved physician training in IBD core metrics and systematic improvements with alerts and documentation are necessary. Active monitoring of compliance with IBD quality metrics is needed to ensure quality patient care.

Conflict of interest None.

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