

# A Nationwide Survey and Needs Assessment of Colonoscopy Quality Assurance Programs in the VA

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Variability exists in quality documentation, measurement, and reporting practices of colonoscopy screening in VA facilities, and most do not have formal performance improvement plans.

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Colorectal cancer (CRC) is an important concern for the VA, and colonoscopy is one primary screening, surveillance, and diagnostic modality used. The observed reductions in CRC incidence and mortality over the past decade largely have been attributed to the widespread use of CRC screening options.<sup>1,2</sup> Colonoscopy quality is critical to CRC prevention in veterans. However, endoscopy skills to detect and remove colorectal polyps using colonoscopy vary in practice.<sup>3-5</sup>

Quality benchmarks, linked to patient outcomes, have been established by specialty societies and proposed by the Centers for Medicare and Medicaid Services as reportable quality metrics.<sup>6</sup> Colonoscopy quality metrics have been shown to be associated with patient outcomes, such as the risk of developing CRC after colonoscopy. The adenoma detection rate (ADR), defined as the proportion of average-risk screening colonoscopies in which 1 or more adenomas are detected, has the strongest association to interval or “missed” CRC after screening colonoscopy and has been linked to a risk for fatal CRC despite colonoscopy.<sup>3</sup>

In a landmark study of 314,872 examinations performed by 136 gastroenterologists, the ADR ranged from 7.4% to 52.5%.<sup>3</sup> Among patients with ADRs in the highest quintile compared with patients in the lowest, the adjusted hazard ratios (HRs) for any interval cancer was 0.52 (95% confidence interval [CI], 0.39-0.69) and for fatal inter-

val cancers was 0.38 (95% CI, 0.22-0.65).<sup>3</sup> Another pooled analysis from 8 surveillance studies that followed more than 800 participants with adenoma(s) after a baseline colonoscopy showed 52% of incident cancers as probable missed lesions, 19% as possibly related to incomplete resection of an earlier, noninvasive lesion, and only 24% as probable new lesions.<sup>7</sup> These interval cancers highlight the current imperfections of colonoscopy and the focus on measurement and reporting of quality indicators for colonoscopy.<sup>8-12</sup>

According to VHA Directive 1015, in December 2014, colonoscopy quality should be monitored as part of an ongoing quality assurance program.<sup>13</sup> A recent report from the VA Office of the Inspector General (OIG) highlighted colonoscopy-quality deficiencies.<sup>14</sup> The OIG report strongly recommended that the “Acting Under Secretary for Health require standardized documentation of quality indicators based on professional society guidelines and published literature.”<sup>14</sup> However, no currently standardized and readily available VHA resource measures, reports, and ensures colonoscopy quality.

The authors hypothesized that colonoscopy quality assurance programs vary widely across VHA sites. The objective of this survey was to assess the measurement and reporting practices for colonoscopy quality and identify both strengths and areas for improvement to facilitate implementation of quality assurance programs across the VA health care system.

## METHODS

The authors performed an online survey of VA sites to assess current colonoscopy quality assurance practices. The institutional review boards (IRBs) at the University of Utah and VA Salt Lake City Health Care System and University of California, San Francisco and San Francisco VA Health Care System classified the study as a quality improvement project that did not qualify for human subjects' research requiring IRB review.

The authors iteratively developed and refined the questionnaire with a survey methodologist and 2 clinical domain experts. The National Program Director for Gastroenterology, and the National Gastroenterology Field Advisory Committee reviewed the survey content and pretested the survey instrument prior to final data collection. The National Program Office for Gastroenterology provided an e-mail list of all known VA gastroenterology section chiefs. The authors administered the final survey via e-mail, using the Research Electronic Data Capture (REDCap; Vanderbilt University Medical Center) platform beginning January 9, 2017.<sup>15</sup>

A follow-up reminder e-mail was sent to nonresponders after 2 weeks. After this second invitation, sites were contacted by telephone to verify that the correct contact information had been captured. Subsequently, 50 contacts were updated if e-mails bounced back or the correct contact was obtained. Points of contact received a total of 3 reminder e-mails until the final closeout of the survey on March 28, 2017; 65 of 89 (73%) of the original contacts completed the survey vs 31 of 50 (62%) of the updated contacts.

## Analysis

Descriptive statistics of the responses were calculated to determine the overall proportion of VA sites measuring colonoscopy quality metrics and identification of areas in need of quality improvement. The response rate for the survey was defined as the total number of responses obtained as a proportion of the total number of points of contact. This corresponds to the American Association of Public Opinion Research's RRI, or minimum response rate, formula.<sup>16</sup> All categoric responses are presented as proportions. Statistical

**TABLE 1** Quality Measurement and Reporting Processes at VA Sites (N = 96)

Measures	Facilities, No.(%)
Collection methods <sup>a</sup>	
Manual chart review	76 (79.2)
Endoscopic software automated output	38 (39.6)
None	1 (1.0)
Personnel collecting quality metrics <sup>a</sup>	
Nursing staff	43 (44.8)
Division or section chief	37 (38.5)
Other (multiple people/staff)	28 (29.2)
Attending physicians	22 (22.9)
Fellows	4 (4.2)
Not applicable	3 (3.1)
How often are quality measures reported?	
Quarterly	40 (41.7)
Monthly	17 (17.7)
Biannually	13 (13.5)
Yearly	7 (7.3)
Weekly	3 (3.1)
Daily	2 (2.1)
Not applicable	4 (4.12)
Not answered	12 (12.5)
Structure of quality reports <sup>a</sup>	
Represents Individual provider data	61 (63.5)
Represents facility level data	39 (40.6)
Represents physician group level data	22 (22.9)
Not applicable	4 (4.2)
Who has access to quality reports? <sup>a</sup>	
Gastroenterology section chief or quality manager	71 (74.0)
Individual endoscopists (individual and peer data)	43 (44.8)
Facility Quality Committee	41 (42.7)
Individual endoscopists (individual data only)	31 (32.3)
Unknown	10 (10.4)
Public access	1 (1.0)
Not applicable	2 (2.1)
Is provider information de-identified?	
Yes	42 (43.8)
No	36 (37.5)
Not applicable (only aggregate data presented)	7 (7.3)
Not answered	13 (13.5)

<sup>a</sup>This item was a check-all-that-apply question. Percentages do not add to 100% because multiple responses could be selected.

analyses were performed using STATA SE 12.0 (College Station, TX).

## RESULTS

Of the 139 points of contact invited, 96 completed the survey (response rate of 69.0%), representing 93 VA facilities

**TABLE 2** Colonoscopy Procedure and Photo Documentation (N = 96)

Procedure Documentation Methods	Facilities, No. (%)
Endoscopic software	51 (53.1)
CORI (Clinical Outcomes Research Initiative, Portland, OR)	4 (4.2)
EndoPro (Pentax, Montvale, NJ)	10 (10.4)
EndoSoft (EndoSoft LLC, Schenectady, NY)	9 (9.4)
gMed (gMed, Weston, FL)	2 (2.1)
Provation (Wolters Kluwer, Minneapolis MN)	8 (8.3)
EndoWorks (gMed, Weston, FL)	8 (18.8)
Provider types free-text note	17 (17.7)
Provider dictates note	11 (11.5)
Computerized Patient Record System templated note	34 (35.4)
Other (combination of methods)	11 (11.5)
Photo-documentation methods	
Images are imported from endoscopy server into VistA as PDF	47 (49.0)
Images printed and scanned into medical record	21 (21.9)
Images imported from endoscopy server into VistA (other)	16 (16.7)
Other	13 (13.5)
None	3 (3.1)

(of 141 possible facilities) in 44 different states. Three sites had 2 responses. Sites used various and often a combination of methods to measure quality (Table 1). The majority of sites reported using manual chart review (79.2%) to collect colonoscopy quality metrics, although only 39.6% reported using endoscopic software to collect quality metrics. A variety of personnel collected quality metrics, the most common being nursing staff (44.8% of participating sites), division/section chiefs (38.5%), multiple other staff (29.2%), and attending physicians (22.9%). The most common reporting frequencies were quarterly (41.7%), monthly (17.7%), and biannually (13.5%).

A majority of sites' (63.5%) quality reports represented individual provider data, whereas fewer provided quality reports for physician groups (22.9%) or for the entire facility (40.6%). Provider quality information was de-identified in 43.8% of reporting sites' quality reports and identifiable in 37.5% of reporting sites' quality reports. A majority of sites (74.0%) reported that the local gastroenterology section chief or qual-

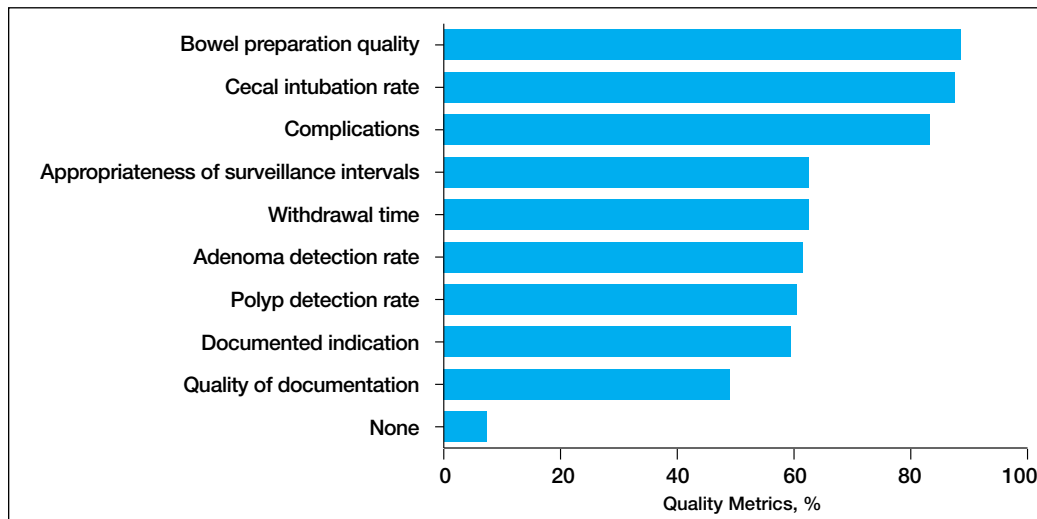
ity manager has access to the quality reports. Fewer sites reported providing data to individual endoscopists (44.8% for personal and peer data and 32.3% for personal data only). One site (1%) responded that quality reports were available for public access.

Survey respondents also were asked to provide the estimated time (hours required per month) to collect the data for quality metrics. Of 75 respondents providing data for this question, 28 (29.2%) and 17 (17.7%), estimated between 1 to 5 and 6 to 10 hours per month, respectively. Ten sites estimated spending between 11 to 20 hours, and 7 sites estimated spending more than 20 hours per month collecting quality metrics. A total of 13 respondents (13.5%) stated uncertainty about the time burden.

As shown in the Figure, numerous quality metrics were collected across sites with more than 80% of sites collecting information on bowel preparation quality (88.5%), cecal intubation rate (87.5%), and complications (83.3%). A majority of sites also reported collecting data on appropriateness of surveillance intervals (62.5%), colonoscopy withdrawal times (62.5%), and ADRs (61.5%). Seven sites (7.3%) did not collect quality metrics.

Information also was collected on colonoscopy procedure documentation to inform future efforts at standardization. A small majority (53.1%) of sites reported using endoscopic software to generate colonoscopy procedure documentation. Within these sites, 6 different types of endoscopic note writing software were used to generate procedure notes (Table 2). Remaining sites used a variety of methods to generate procedure notes, including typing free-text notes (17.7%) and dictation (11.5%); 35.4% of sites use a template note in the Computerized Patient Record System. Sites also used a variety of methods for photo documentation in the electronic medical record (eg, pictures of cecal intubation and polyps).

Most sites (85.4%) were aware of VHA Directive 1015 recommendations for colonoscopy quality assurance programs. A significant majority (89.5%) of respondents also indicated interest in a centralized automatic reporting system to measure and

**FIGURE** Colonoscopy Quality Metrics Collected Across the VHA

report colonoscopy quality in some form, either with aggregate data, provider data, or both (Table 3).

## DISCUSSION

This survey on colonoscopy quality assurance programs is the first assessment of the VHA's efforts to measure and report colonoscopy quality indicators. The findings indicated that the majority of VA sites are measuring and reporting at least some measures of colonoscopy quality. However, the programs are significantly variable in terms of methods used to collect quality metrics, specific quality measures obtained, and how quality is reported.

The authors' work is novel in that this is the first report of the status of colonoscopy quality assurance programs in a large U.S. health care system. The VA health care system is the largest integrated health system in the U.S., serving more than 9 million veterans annually. This survey's high response rate further strengthens the findings. Specifically, the survey found that VA sites are making a strong concerted effort to measure and report colonoscopy quality. However, there is significant variability in documentation, measurement, and reporting practices. Moreover, the majority of VA sites do not have formal performance improvement plans in place for endoscopists who do not meet thresholds for colonoscopy quality.

Screening colonoscopy for CRC offers

known mortality benefits to patients.<sup>1,17-19</sup> Significant prior work has described and validated the importance of colonoscopy quality metrics, including bowel preparation quality, cecal intubation rate, and ADR and their association with interval colorectal cancer and death.<sup>20-23</sup> Gastroenterology professional societies, including the American College of Gastroenterology and the American Society for Gastrointestinal Endoscopy, have recommended and endorsed measurement and reporting of colonoscopy metrics.<sup>24</sup> There is general agreement among endoscopists that colonoscopy quality is an important aspect of performing the procedure.

The lack of formal performance improvement programs is a key finding of this survey. Recent studies have shown that improvements in quality metrics, such as the ADR, by individual endoscopists result in reductions in interval colorectal cancer and death.<sup>25</sup> Kahi and colleagues previously showed that providing a quarterly report card improves colonoscopy quality.<sup>26</sup> Keswani and colleagues studied a combination of a report card and implementation of standards of practice with resultant improvement in colonoscopy quality.<sup>27</sup> Most recently, in a large prospective cohort study of individuals who underwent a screening colonoscopy, 294 of the screening endoscopists received annual feedback and quality benchmark

**TABLE 3** Performance Improvement and Quality Assurance Programs (N = 96)

Questions	Facilities, No. (%)
Have you previously been informed of VHA Directive 1015 (Colonoscopy Quality Assurance)?	
No	9 (9.4)
Yes	82 (85.4)
Not answered	7 (7.3)
Does your gastroenterology section/laboratory have a formal performance improvement plan for endoscopists who do not meet the standards of colonoscopy quality?	
No	51 (53.1)
Yes	22 (22.9)
I don't know	18 (18.8)
Would you be interested in using a centralized, automatic reporting system to measure colonoscopy quality at your site?	
Yes, for aggregate level data	66 (68.8)
Yes, for provider level data	61 (63.5)
No	12 (12.5)

indicators to improve colonoscopy performance.<sup>25</sup> The majority of the endoscopists (74.5%) increased their annual ADR category over the study period. Moreover, patients examined by endoscopists who reached or maintained the highest ADR quintile (> 24.6%) had significantly lower risk of interval CRC and death. The lack of formal performance improvement programs across the VHA is concerning but reveals a significant opportunity to improve veteran health outcomes on a large scale.

This study's findings also highlight the intense resources necessary to measure and report colonoscopy quality. The ability to measure and report quality metrics requires having adequate documentation and data to obtain quality metrics. Administrative databases from electronic health records offer some potential for routine monitoring of quality metrics.<sup>28</sup> However, most administrative databases, including the VA Corporate Data Warehouse (CDW), contain administrative billing codes (ICD and CPT) linked to limited patient data, including demographics and structured medical record data. The actual data required for quality reporting of important metrics (bowel preparation qual-

ity, cecal intubation rates, and ADRs) are usually found in clinical text notes or endoscopic note documentation and not available as structured data. Due to this issue, the majority of VA sites (79.2%) are using manual chart review to collect quality metric data, resulting in widely variable estimates on time burden. A minority of sites in this study (39.6%) reported using automated endoscopic software reporting capability that can help with the time burden. However, even in the VA, an integrated health system, a wide variety of software brands, documentation practices, and photo documentation was found.

Future endoscopy budget and purchase decisions for the individual VA sites should take into account how new technology and software can more easily facilitate accurate quality reporting. A specific policy recommendation would be for the VA to consider a uniform endoscopic note writer for procedure notes. Pathology data, which is necessary for the calculation of ADR, also should be available as structured data in the CDW to more easily measure colonoscopy quality. Continuous measurement and reporting of quality also requires ongoing information technology infrastructure and quality control of the measurement process.

### Limitations

This survey was a cross-section of VA sites' points of contact regarding colonoscopy quality assurance programs, so the results are descriptive in nature. However, the instrument was carefully developed, using both subject matter and survey method expertise. The questionnaire also was refined through pretesting prior to data collection. The initial contact list was found to have errors, and the list had to be updated after launching the survey. Updated information for most of the contacts was available.

Another limitation was the inability to survey nongastroenterologist-run endoscopy centers, because many centers use surgeons or other nongastroenterology providers. The authors speculate that quality monitoring may be less likely to be present at these facilities as they may not be aware of the gastroenterology



professional society recommendations. The authors did not require or insist that all questions be answered, so some data were missing from sites. However, 93.7% of respondents completed the entire survey.

## CONCLUSION

The authors have described the status of colonoscopy quality assurance programs across the VA health care system. Many sites are making robust efforts to measure and report quality especially of process measures. However, there are significant time and manual workforce efforts required, and this work is likely associated with the variability in programs. Importantly, ADR, which is the quality metric that has been most strongly associated with risk of colon cancer mortality, is not being measured by 38% of sites.

These results reinforce a critical need for a centralized, automated quality reporting infrastructure to standardize colonoscopy quality reporting, reduce workload, and ensure veterans receive high-quality colonoscopy.

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## Author disclosures

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