

Longitudinal assessment of colonoscopy quality indicators: a report from the Gastroenterology Practice Management Group

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Background: There is increasing demand for colonoscopy quality measures for procedures performed in ambulatory surgery centers. Benchmarks such as adenoma detection rate (ADR) are traditionally reported as static, one-dimensional point estimates at a provider or practice level.

Objective: To evaluate 6-year variability of ADRs for 370 gastroenterologists from across the nation.

Design: Observational cross-sectional analysis.

Setting: Collaborative quality metrics database from 2007 to 2012.

Patients: Patients who underwent colonoscopies in ambulatory surgery centers.

Interventions: Colonoscopy.

Main Outcome Measurements: The number of colonoscopies with an adenomatous polyp divided by the total number of colonoscopies (ADR-T), inclusive of indication and patient's sex.

Results: Data from 368,157 colonoscopies were included for analysis from 11 practices. Three practice sites (5, 8, and 10) were significantly above and 2 sites (3, 7) were significantly below mean ADR-T, with a 95% confidence interval (CI). High-performing sites had 9.0% higher ADR-T than sites belonging to the lowest quartile ($P < .001$). The mean ADR-T remained stable for 9 of 11 sites. Regression analysis showed that the 2 practice sites where ADR-T varied had significant improvements in ADR-T during the 6-year period. For each, mean ADR-T improved an average of 0.5% per quarter for site 2 ($P = .001$) and site 3 ($P = .021$), which were average and low performers, respectively.

Limitations: Summary-level data, which does not allow cross-reference of variables at an individual level.

Conclusion: We found performance disparities among practice sites remaining relatively consistent over a 6-year period. The ability of certain sites to sustain their high-performance over 6 years suggests that further research is needed to identify key organizational processes and physician incentives that improve the quality of colonoscopy. (Gastrointest Endosc 2014;80:835-41.)

Abbreviations: ADR, adenoma detection rate; ADR-T, adenoma detection rate-total; ASC, ambulatory surgery centers; GPMG, Gastroenterology Practice Management Group; IT, information technologies.

DISCLOSURE: T. Deas is the chief medical officer for Sandlot Solutions and a member of the Physician Leadership Board for Surgical Care Affiliates. N. Guda is a consultant for Boston Scientific. S. Morris is on the Advising Board for CRH Medical Corp. J. Allen is an advisor for Pentax, Johnson and Johnson, and Myriad Genetics. All other authors disclosed no financial relationships relevant to this publication.

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Since 1999, the number of ambulatory surgery centers (ASCs) in the United States has grown by 8.3% annually.¹ Colonoscopy is one of the most common procedures performed in ASCs, and there is increasing demand for colonoscopy quality metrics for procedures performed in ASCs from hospital networks, commercial and government payers, and patients. Current information technology platforms have significant barriers that limit the ability of clinicians to measure performance metrics across ASCs.

Adenoma detection rates (ADRs) have been linked to interval colon cancers and thus have emerged as an important measure of colonoscopy quality.² A physician's ADR is traditionally defined as the percentage of screening colonoscopy examinations in which the endoscopist identifies and removes an adenomatous polyp. ADRs usually are calculated as average point estimates that are obtained over a specified time period (usually annually) and are static and 1-dimensional. Little information exists concerning temporal changes in ADR, so it is unclear whether a physician's individual or practice site ADR varies over time.³ Our aim was to evaluate the 370 members of the Gastroenterology Practice Management Group (GPMG), focusing on the variability of ADRs over a 6-year time period.

METHODS

This is a cross-sectional study of ongoing data collected by the GPMG from 2007 to the third quarter of 2012. GPMG is a consortium of 13 large gastroenterology practices in the nation, representing 370 gastroenterologists. Part of the mission of GPMG is to share information on quality metrics under the broad umbrella of collaborating on best practices. The data are derived from diverse geographic areas of the United States (in alphabetical order: Colorado, Florida, Georgia, Illinois, Minnesota, Mississippi, Missouri, Nevada, Tennessee, Texas, Washington, Washington DC, Wisconsin) and represent large practices (10-75 gastroenterologists per practice) and high-volume ASCs (5000-60,000 endoscopic procedures per year per group) of similar operating structures.

The Centers for Medicare & Medicaid Services defines ASCs as a distinct entity that operates exclusively for the purpose of furnishing outpatient surgical services to patients.⁴ Each group has its own quality management framework and provides predefined data elements on several quality measures at different time points. For each participating site, a research coordinator collected de-identified, group-level data on a quarterly basis from one or multiple ASCs. Database auditing is performed periodically for accuracy and consistency between quarters. Each practice site provides its physician members a performance report card on various quality metrics benchmarked with group and national averages on a

Take-home Message

- Adenoma detection rates (ADRs) inclusive of colonoscopy for all indications and patient sex (total number of colonoscopies [ADR-T]) can be a helpful quality metric for colonoscopies performed in ambulatory surgery centers. ADR-T can demonstrate temporal variability when analyzed over a 6-year period.
- There is an opportunity to streamline database extraction in ambulatory surgery centers and to identify key organizational processes and physician incentives that improve the quality of colonoscopy.

yearly or quarterly basis, beginning this process at different time periods from 2008 onward.

We defined ADR as the number of colonoscopies with an adenomatous polyp divided by the total number of colonoscopies (ADR-total or ADR-T). We divided the sites into 3 groups (high, middle, and low), based on their ADR-T performances. ADR-T was not stratified by patient sex or indication (such as screening, surveillance, or to evaluate for symptoms) in the summary-level database. The quality of bowel preparation was recorded as excellent, good, fair, and poor. Unusual reporting frequencies from each quarter, such as inconsistent data, were excluded from analysis. Because this unusual reporting may simply be a result of data entry error, we excluded only those measurements lying more than 5 standard deviations from those usually reported by a practice site.

Statistical analysis

We calculated the overall ADR-T and assessed for consistency of performance by using the quarterly ADR's of each practice to find a 95% *t*-confidence interval (CI) for each practice. The expectation is that an ASCs quarterly ADR-T will fall within this CI about 95% of the time. An ASC with significantly higher ADR-T than expected has a CI that lies entirely above the average ADR-T taken from all practices, whereas an ASC with significantly lower ADR-T than expected has a CI entirely below the average ADR-T in the study.

To determine whether ASCs were improving over time, we also used regression analysis on the quarterly ADR-T values for each practice. The *P* value for the deterministic trends in [Figure 3](#) gives the probability of an increase if there were not a true increase in the actual ADR values. IBM SPSS 21 for Windows package (IBM, Armonk, NY, USA) was used for statistical analysis.

RESULTS

From a total of 418,978 colonoscopies performed in ASCs, quarterly data entries demonstrating unusual frequencies were excluded ($n = 50,821$), leaving 368,157 cases for analysis ([Table 1](#)). Of the 11 practice sites that

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