Assessing Colonoscopy Training Outcomes Using Quality Indicators

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Abstract

Purpose Training numbers for colonoscopy vary among specialties. Tracking colonoscopy quality indicators for program graduates may provide reliable outcome data to improve educational programs and establish training requirements. The purpose of this study was to measure specific colonoscopy quality indicators for a family medicine graduate to determine if outcome can be used to assess the quality of procedure training and contribute to more objective means of establishing training numbers.

Methods We present a case series of the first 800 colonoscopies performed by a newly credentialed family physician who had performed 101 procedures during residency training. Procedure reports and medical records were reviewed for all patients receiving a colonoscopy by

this physician from September 2003 to September 2007. Selected quality indicators were compared to recommended colonoscopy standards.

Results The overall reach-the-cecum rate was 98.6%. Adenomas were detected in 21.6% of females and 33.7% of males. All polyps measuring less than 2 cm were removed. Epinephrine was used for 3 patients with hemostasis after polypectomy. There were no perforations.

Conclusions Quality indicators for colonoscopy were met after 101 supervised procedures. Postgraduate tracking of nationally recognized colonoscopy quality indicators can provide valuable outcome data to improve residency training and assist in establishing uniform training requirements among specialties.

Introduction

Assessing competence is essential in colonoscopy training. The minimum number of recommended procedures during training ranges from 50 to 140 among the specialties of family medicine, internal medicine, general surgery, and

gastroenterology.¹⁻⁵ Minimal studies exist to support specific training numbers.⁶⁻¹²

The Accreditation Council for Graduate Medical Education (ACGME) Outcome Project requires programs to use more objective methods to assess resident attainment of competence.¹³ Programs are also required to use graduate performance as part of the annual review of their curriculum.¹⁴ Board certification rates and subjective graduate surveys are typically used to meet this requirement.

The American Society for Gastrointestinal Endoscopy (ASGE) and the American College of Gastroenterology (ACG) have recently established practical quality measures to grade endoscopy performance. These objective measures can be used to distinguish high-quality endoscopic procedures done by an adequately trained endoscopist.¹⁵⁻¹⁷ Tracking graduate quality indicators in colonoscopy may provide objective outcome data to improve procedure training and establish a minimum number of procedures required during training.

We present a case series of the first 800 colonoscopies performed by a newly credentialed family physician who had performed 101 procedures during residency training. The purpose of this study was to measure specific colonoscopy quality indicators to demonstrate how graduate outcome data can be used to assess the quality of procedure training and contribute to a more objective means of establishing training numbers.

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Methods

Procedure reports from the first 800 colonoscopies performed by a family physician who had previously completed 101 supervised procedures during residency training were reviewed by 3 physicians who were not blinded. Procedures were performed at a community hospital and medical center from September 2003 to September 2007. All patients receiving a colonoscopy by the family physician were included. Five key quality indicators for colonoscopy were measured and compared to recommended competency standards as put forth by the ASGE and ACG. Descriptive statistics were used to document results.

Quality Indicators for Colonoscopy

Reach-the-Cecum Rate All procedure reports were reviewed for written documentation and photographic evidence of cecal landmarks to determine if the cecum had been intubated for each procedure. Quality endoscopists are expected to reach the cecum in 95% of procedures performed.¹⁷

Adenoma Detection Rate Pathology reports for all patients receiving screening colonoscopy after age 50 years were reviewed. The detection rate for adenomas and other dysplastic polyps was determined. Dysplastic polyps were defined as tubular adenomas, serrated adenomas, tubulovillous adenomas, villous adenomas, high-grade dysplasia, or adenocarcinoma. In asymptomatic individuals undergoing screening colonoscopy after age 50 years, the expected adenoma detection rate is 15% in women and 25% in men.¹⁷

Polyp Resection Attempt The endoscopic findings and physician recommendations from all procedure reports were reviewed. The number of mucosally based polyps measuring less than 2 cm that were endoscopically removed and not sent for surgical resection was determined. It is expected that a quality endoscopist attempt the endoscopic resection of all mucosally based polyps measuring less than 2 cm before referring a patient for surgical resection.¹⁷

Bleeding Rate All procedure reports were reviewed for immediate bleeding complications. The electronic medical record was also reviewed for at least 6 months after the procedure for delayed bleeding complications requiring a repeat colonoscopy or hospital admission. The bleeding complication rate should be less than 1%.¹⁷

Perforation Rate All procedure reports were reviewed for immediate perforations at the time of endoscopy. The electronic medical record was also reviewed for at least 6 months after the procedure for any colon perforations diagnosed after endoscopy. The perforation rate should be less than 0.1%.¹⁷

This study received institutional review board approval from Madigan Army Medical Center, Fort Lewis, Washington. There was no outside funding for this study.

TABLE 1	COLONOSCOPY INDICATIONS
Indication ^a	Patients
Average-Risk Screening	415
Personal History of Polyps	114
Family History of Colon Cancer	114
Hematochezia	101
Family History of Polyps	52
Iron Deficiency Anemia	41
Chronic Diarrhea	27
Abdominal Pain	20
Polyp on Flexible Sigmoidoscopy	15
Personal History of Colon Cancer	9
Positive Fecal Occult Blood Test	9
Abnormal Radiograph	8
Inflammatory Bowel Disease Surveillance	7
Follow-up From Prior Endoscopy	5
Change in Bowel Habits	4
Unintentional Weight Loss	2
Chronic Constipation	2

^a Some individuals had more than 1 indication.

Results

Colonoscopies were performed on 800 patients (379 men, 421 women) ages 19 to 87 years, with an average age of 56.1 years. The most common indication for the procedure was average risk colorectal cancer screening (TABLE 1). The overall reach-the-cecum rate was 98.6% (789 of 800). The reach-the-cecum rate for the first 100 procedures after training was 98% (FIGURE).

Of the 800 procedures, 660 were performed on asymptomatic patients who received screening colonoscopy after age 50 years. In those patients, adenomas were detected in 21.6% of women (77 of 357) and 33.7% of men (102 of 303). The adenoma detection rate for the first 100 procedures also exceeded quality standards (TABLE 2).

All polyps measuring less than 2 cm (n = 1020) were removed by using both snare polypectomy (n = 238) and cold biopsy polypectomy (n = 782) techniques. The most common pathology diagnoses were hyperplastic polyps and tubular adenomas (TABLE 3). Epinephrine was used for hemostasis in 3 patients after polypectomy (0.4%). There were no perforations, delayed bleeding, or other significant complications in any of the procedures performed upon review of the medical record.

FIGURE REACH THE CECUM RATE

Discussion

Assessing Program Effectiveness

Tracking graduate quality indicators in colonoscopy can provide valuable outcome measures to assess overall program effectiveness in procedural training. Because most

residents and fellows require assistance during training, tracking certain quality indicators, such as the reach-the-cecum rate, would not meet quality standards during the training period. Simply inquiring about how well graduates felt they were prepared during residency falls short of the ACGME's intent of objectively assessing whether residents

TABLE 2 SEQUENTIAL ADENOMA DETECTION RATE IN SCREENINGS OF PATIENTS OLDER THAN 50 YEARS (N = 660)

Colonoscopies ^a , No.	Women With Adenomas, No.	Total Women, No.	Female Detection Rate ^b , %	Men With Adenomas, No.	Total Men, No.	Male Detection Rate ^c , %
1-100	12	56	21.4	13	44	29.5
101-200	11	64	17.2	12	36	33.3
201-300	9	57	15.8	16	43	37.2
301-400	16	50	32.0	15	50	30.0
401-500	10	46	21.7	20	54	37.0
501-600	14	53	26.4	16	47	34.0
601-660	5	31	16.1	10	29	34.5
Total	77	357	21.6	102	303	33.7

^a After 101 supervised procedures completed during training.

^b Standard is 15%.

^c Standard is 25%.

TABLE 3 MOST COMMON DIAGNOSES	
Diagnosis	No. of Cases
Hyperplastic Polyps	554
Tubular Adenomas	364
Lymphoid Aggregate	35
Colitis	29
Tubulovillous Adenomas	11
High-Grade Dysplasia	9
Adenocarcinoma	6
Inflammatory Polyps	4
Serrated Adenomas	3

have attained competence. Requiring quality indicator feedback after graduation would allow programs to make meaningful improvements in their training programs based on postgraduate outcome data.

The physician in this study received 6 weeks of endoscopy training in residency during which he performed 101 diagnostic colonoscopies under the supervision of 6 gastroenterologists. He performed 48 snare polypectomies and used biopsy forceps more than 100 times to perform excisional polypectomies or colon biopsies. This case series demonstrates that all selected quality indicators were met after residency training. On the basis of these data, the program that trained this resident may choose to continue using the current curriculum, tracking future graduate performance, and modifying the training program as needed based on additional graduate data.

Establishing Minimum Procedure Thresholds

Tracking graduate quality indicators in colonoscopy can also assist specialties in establishing a minimum threshold for the number of procedures required before competency can be achieved. Although attainment of competence and hospital privileges should ultimately be based on training, experience, and demonstrated ability, it would be useful to use outcome data to accurately define a uniform standard for the number of supervised procedures needed during training. This case series also supports other studies that show that safe and effective colonoscopy can be performed by family physicians.¹⁸

Limitations of Study

Limitations of this study include using chart reviewers who were not blinded and not reviewing potential records of patients who may have presented with complications to another facility after their procedure, although this is unlikely in the military health care system. This study is also limited by its focus on the data from a single graduate

performing colonoscopy. Despite this limitation, the major contributions of this study are introducing the concept of using procedure outcome data for graduates, assessing the quality of residency procedure training, and contributing to the establishment of more evidence-based objective training numbers. Transitioning to this unique way of gathering objective data will lead to high-quality endoscopic procedures performed by competent graduates. By establishing specific quality indicators for other specialty procedures, this method of obtaining outcome data can be expanded to further improve other procedural training and provide quality patient care. Further research should focus on using outcome data in addition to validated and skill-specific competency assessments to objectively assess procedure competence in training programs.

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