Equivalence in Colonoscopy Results Between Gastroenterologists and General Surgery Residents Following an Endoscopy Simulation Curriculum

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BACKGROUND: In 2011, multiple gastroenterology societies published a position statement expressing concern over the American Board of Surgery guidelines regarding endoscopy education. Their position asserted that the American Board of Surgery's guidelines were inadequate to produce competency and the requirements should be similar to those adopted by the American Society for Gastrointestinal Endoscopy. This assertion failed to take into account the increasing use of simulation in surgical and endoscopic education.

METHODS: Surgery residents were required to complete a self-paced endoscopy simulation curriculum. A retrospective review of all patients undergoing colonoscopy at a single institution over a 6-month period was then undertaken. Specifically, the quality measures associated with colonoscopy including the cecal intubation rate and the adenoma detection rate (ADR) were compared between those colonoscopies that were performed by faculty gastroenterologists and general surgery residents.

RESULTS: In total, 818 colonoscopies were performed during the study period—598 were performed by the gastroenterology service (GI) and 220 were performed by general surgery residents on the surgery service (GS). Baseline characteristics of the groups were similar. Cecal intubation rates for GI and GS were 98.4% and 93.5% respectively. ADRs were similar between the groups (GI—29.8% in men and 15.3% in women; GS—26.8% in men and 18.7% in women). GI was found to perform biopsies at a higher rate than GS: 0.92 vs 0.62 (not significant, NS). GS had a higher rate of adenomas biopsied: 0.42 vs 0.32 (NS).

CONCLUSIONS: Following endoscopy simulation training, general surgery residents, under the supervision of surgical staff, are capable of achieving quality measures equivalent to those of staff gastroenterologists at a single institution. The ADRs and cecal intubation rates seen in this study are consistent with those previously identified in the literature. (J Surg 72:654-657. Published by Elsevier Inc on behalf of the Association of Program Directors in Surgery)

KEY WORDS: colonoscopy, resident education, quality metrics, simulation

COMPETENCIES: Patient Care, Practice-Based Learning and Improvement, Systems-Based Practice

INTRODUCTION

In 2011, the American Society for Gastrointestinal Endoscopy, the American Association for the Study of Liver Diseases, the American College of Gastroenterology, and the American Gastroenterological Association published a joint statement expressing concern over the American Board of Surgery's recent adjustments regarding endoscopy requirements for surgical residents.[1] These societies asserted that the number of required procedures for surgical trainees was insufficient to achieve training or competence and that any minimum standard for surgical trainees should be aligned with those adopted by the ASGE, which requires a minimum of 140 colonoscopies and 130 upper endoscopies.

This position paper cited a 2010 study by Spier et al.,[2] where gastroenterology fellows were unable to demonstrate independent competence after completing a minimum requirement of 140 colonoscopies. This study projected that 500 colonoscopies are required for gastroenterology fellows to achieve 92% independent competence. However,

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these assertions do not take into account the advent of simulation in surgical and endoscopic education. As surgical and endoscopic simulation is becoming more frequently employed, these techniques have demonstrated that the skills can be transferred to clinical practice, and perhaps the procedural benchmarks need to be adjusted accordingly.[3]

Although there remains no clear consensus regarding trainee procedure volume, it is well accepted that competency should be based on outcomes and quality measures rather than on a minimum number of procedures performed. The most widely accepted quality measures currently used for colonoscopy are adenoma detection rate (ADR), cecal intubation rate, and complication rates.[4,5] Of these, ADR is the most widely studied. The ADR, defined as the proportion of individuals undergoing a complete screening colonoscopy who have one or more adenomas detected, has been established to be more than 25% in men and 15% in women in several cross-sectional studies.[6–8] Likewise, the rate of cecal intubation, or complete colonoscopy, has been shown to be achievable in greater than 90% of patients,[7,9,10] and it is an another quality measure.[4] As the primary aim of a screening colonoscopy remains the detection and removal of premalignant lesions, these quality measures ensure that the colonoscopy is safe, thorough, and reduces the chance of the individual developing subsequent colorectal cancer.

We sought to evaluate the ability of general surgery residents under the supervision of staff surgeons to perform quality colonoscopies after these residents had undergone an endoscopy simulation curriculum. These general surgery residents were compared with staff gastroenterologists at a single institution, using the aforementioned quality indicators.

MATERIALS AND METHODS

After IRB approval, deidentified records of all patients who underwent colonoscopy at a single institution during a 6-month period (January 2012 to June 2012) were reviewed. Colonoscopies that could not be completed owing to an inadequate bowel preparation were excluded. At our institution, all endoscopic procedures are performed by either the gastroenterology (GI) or general surgery services (GS). Patients at this facility comprise a combination of active duty military members, active duty family members, military retirees, and Veterans Administration beneficiaries. Medical records and colonoscopy reports were reviewed to identify patient demographic information, indication for procedure, number of biopsies taken, pathology of specimens, the number of adenomas detected, colonoscopy completion, and whether a resident was involved in the procedure.

On the general surgery service, residents perform endoscopy either in their second or third year of clinical training. They are required to successfully complete an endoscopy simulator program on the Accu-Touch Endoscopy Simulator before performing endoscopy on patients. This self-paced curriculum consists of an introductory demonstration by one of the surgical staff, and then each resident is required to successfully perform 10 upper and 10 lower endoscopic procedures. The computer program requires successful use of sedation and safe insertion and visualization techniques, and it aborts the procedure and records it as incomplete if the entire procedure is not performed to standard.

Each resident typically spends 10 weeks per year involved in performing endoscopic procedures in a surgical endoscopy center. All procedures are performed under the direct supervision of surgical staff in a dedicated endoscopic suite. Sedation and patient airway are managed by an independent anesthesia provider. Procedures performed by gastroenterologists are also completed with anesthesia support in a dedicated endoscopic suite. All colonoscopies performed by staff gastroenterologists are without participation of residents or gastroenterology fellows.

The primary outcome measures were ADR and cecal intubation rates. In determining these rates, only asymptomatic patients older than 50 years undergoing screening colonoscopy were included. ADR was calculated as the proportion of individuals in whom one or more adenomatous polyps were detected. Only pathologically confirmed adenomatous polyps were used in this calculation, and hyperplastic polyps were excluded. Similarly, cecal intubation rate was calculated as the proportion of screening procedures where visualization of the cecum or terminal

TABLE 1. Demographic Information and Indication for Total Population

	General Surgery	Gastroenterology
Average age	54.1	52.6
%Male	66.9	56.9
Average BMI	29.2	32.5
Indication		
Screening	73	191
Increased risk screening	4	43
Bleeding	38	108
Surveillance	27	72
Abdominal pain	17	43
Change in bowel habits	8	16
Diarrhea	0	15
Abnormal radiology	7	8
Anemia	9	56
Procedural planning	5	0
Hx of diverticulitis	11	6
Weight loss	0	5
Hx of IBD	1	15
Other	18	13
Total	**218**	**591**

BMI, body mass index.