

Are General Surgery Residents Accurate Assessors of Their Own Flexible Endoscopy Skills?

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BACKGROUND: Surgeons in training must be able to accurately gauge their own ability and performance to better understand where additional practice is needed and can help inform self-directed learning endeavors. This study had the following 3 goals: (1) to examine the accuracy of residents' assessments of their endoscopic skills, (2) to investigate if accuracy improves over time and practice, and (3) to compare the efficacy of 3 interventions—practice only (PO), self-observation (SO), or expert observation (EO)—on self-assessment accuracy.

METHODS: Overall, 30 first-year general surgery residents completed a pretest on a colonoscopy simulator, which measured time to completion, time to reach the cecum, efficiency of screening, percentage of mucosal surface area examined, time the patient was in pain, and time with a clear view. Residents assigned to the SO and EO conditions reviewed a video of their own performances (SO) or an expert's performance (EO). Residents in all conditions engaged in practice trials using an abstract endoscopy training exercise. Residents then completed a posttest. Self-assessment was examined by calculating discrepancy scores by subtracting actual measurements from participant judgments.

RESULTS: Results indicated that performance for participants in the PO group significantly improved from pretest to posttest for 2 of the 6 metrics and participants in the SO and EO groups improved for 4 metrics. In terms of self-assessment discrepancy scores, only the EO group significantly improved for 2 of the 6 metrics (overall time and screening efficiency).

DISCUSSION: Novice trainees are inaccurate self-assessors of their endoscopic skills before training. Allowing trainees

to watch videos of themselves or an expert performing an endoscopic task enhances performance. Participants assigned to PO exhibited decreased ability to accurately judge their own performance. Those in the EO group became significantly better at assessing their overall time and overall efficiency.

SUMMARY: Novice trainees are inaccurate self-assessors of their endoscopic skills before training. Allowing trainees to watch videos of themselves or an expert performing an endoscopic task enhances performance. (J Surg Ed ■■■■■■. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: endoscopy, self-assessment, video review, residents, education

COMPETENCY: Practice-Based Learning and Improvement

INTRODUCTION

Flexible endoscopy is commonly performed by general surgeons. In fact, it is one of the most commonly performed procedures in practice according to the American Board of Surgery (ABS).¹ To better prepare graduating residents to perform these procedures, in 2013 the ABS instituted a requirement for all general surgery residents to complete a 5-year distributed curriculum in flexible endoscopy (the ABS Flexible Endoscopy Curriculum [FEC]) which includes performance milestones such as passage of the Fundamentals of Endoscopic Surgery program,² a test of knowledge and technical skill in gastrointestinal endoscopy created by the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). As flexible endoscopy continues to be more widely used by both surgical trainees and practitioners, it is critical to better understand how accurate surgeons are in assessing their own endoscopic skills to identify strategies to increase the accuracy of

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endoscopic self-assessment—a prerequisite to self-directed performance improvement.

Research has shown that surgical trainees struggle to accurately evaluate their own skills, ranging from technical skills such as suturing and bowel anastomosis³ to nontechnical skills such as communication, leadership, and interpersonal skills.⁴⁻⁶ The theoretical underpinnings of this inaccuracy is often explained by the Kruger-Dunning effect,⁷ which describes the cognitive bias in which the poorest performers overestimate their abilities and the strongest performers underestimate their abilities. Specifically, poor performers are “unskilled and unaware” prompting them to overestimate their skillset, whereas skilled trainees assume that if a task were easy for them to learn, then their peers could also learn it effortlessly, thereby underestimating their ability.

However, it is critical that surgeons, and especially surgeons in training, are able to accurately gauge their own ability and performance. Accurate self-assessment is critical for trainees to better understand where additional practice is needed and can help inform self-directed learning endeavors. Additionally, surgeons who are unable to recognize the limits of their competency can cause serious harm in actual patient care settings.⁸ Fortunately, a small number of studies have been able to demonstrate that self-assessment accuracy can be improved over time. For example, MacDonald et al.⁹ were able to show that trainee estimates of errors (but not time) became more accurate as they completed more repetitions on a basic laparoscopic task. Additionally, other work has shown that trainees can become more accurate self-assessors with a combination of practice, self-observation (SO), and review of expert videotapes when performing a complex Nissen fundoplication.¹⁰

These studies suggest that interventions may be created to improve self-assessment of surgical skills. However, we have yet to fully understand (1) if trainees are accurate judges of their endoscopic skills and (2) if interventions designed to improve accuracy of self-assessments are effective. As attention on surgical resident endoscopy skills continues to grow, it is critical that surgical educators better understand potential barriers to achieving competency (i.e., inaccurate self-assessment) and are able to identify potential opportunities to enrich endoscopic training programs.^{11,12} To achieve these aims, we designed a study with the following 3 overarching goals: (1) to examine the accuracy of residents' assessments of their endoscopic skills, (2) to investigate if accuracy improves over time and practice, and (3) to compare the efficacy of 3 interventions—practice only (PO), SO, or expert observation (EO)—on self-assessment accuracy.

METHODS

General surgery residents from the University of Texas Southwestern participated in this study. The IRB deemed this project exempt.

All participants were provided a 10-minute overview of the project, an orientation to endoscopic technique, and observed the proctor completing an example task (Lower GI Task 2) on the GI Mentor II (Symbionix, Cleveland, OH), a virtual reality endoscopic trainer that has been suggested to be ideal for endoscopic skill development among novices.¹³ Participants then performed a standard diagnostic colonoscopy (Lower GI Task 3). This task was chosen because it did not require use of insufflation or suction to visualize the mucosa allowing participants to focus on maneuvering the colonoscope. No time limit was set and no formal feedback provided; participants were blinded to the results summary from the GI Mentor. All tasks were video-recorded. After completing the task, all participants completed a self-assessment, in which they evaluated themselves in the following 7 areas: overall time, time to cecum, overall efficiency of screening, percentage of mucosal surface examined, percentage of time in which the patient was in pain, overall performance, and overall performance compared to peers (Appendix 1).

Participants were then randomized into 1 of 3 groups that are PO, SO, or EO (Fig. 1). In the SO group, participants watched their video-recorded performance and critiqued themselves. The self-critique (Appendix 2) consisted of an open-response questionnaire in which participants graded themselves on overall time, overall efficiency, percentage of mucosal surface examined, percentage of time patient was in pain, and overall performance and also created one goal to work on to improve in each area. In the EO group, participants watched a video of a faculty expert performing the same task. While watching the task, participants also completed a questionnaire in which they were asked to set 3 goals for themselves to improve, based on the expert's technique (Appendix 3). After watching their respective videos, participants in the SO and EO groups then completed their practice sessions, which consisted of 10 repetitions of the Endobubble 1 Task, which requires navigating through a virtual colon to pop 20 balloons. In the PO group, participants performed 11 repetitions (1 additional repetition to compensate for the added exposure to endoscopy that the other groups received) of the Endobubble 1 Task immediately after completing the self-assessment of Task 3. After their respective practice sessions, participants in all groups performed Lower GI Task 3 again on the GI Mentor and completed a self-assessment. Objective assessment of endoscopic skills during the pretest and posttest-simulated colonoscopy was based on parameters measured by the computer system, including overall time, time to cecum, percentage of mucosal surface examined, percentage of time with a clear view, percentage of time patient was in pain, and overall efficiency of screening. Additionally, overall time and performance during the Endobubble practice sessions was recorded.

Statistical analyses were performed using SPSS version 21 (IBM; Chicago, IL). Discrepancy scores were created by

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