ADVANCES IN ENDOSCOPY

Current Developments in Diagnostic and Therapeutic Endoscopy

Section Editor: Klaus Mergener, MD, PhD, MBA

Improving Quality and Outcomes in Colonoscopy

Aasma Shaukat, MD, MPH
Robert M. and Mary H. Glickman Professor of Medicine and Gastroenterology
Department of Medicine
Director of Outcomes Research
Division of Gastroenterology and Hepatology
NYU Langone Health
New York, New York

G&H Why should the quality of colonoscopy be a major concern among clinicians?

AS Colonoscopy is a highly effective tool for preventing and reducing the burden of colorectal cancer. However, colonoscopy is highly operator-dependent, which means that this variability can affect how effective a clinician is in reducing the incidence of colorectal cancer. Therefore, quality indicators are needed to ensure that the colonoscopy achieves its purpose.

There are also other reasons to ensure a high-quality colonoscopy. First, it is clearly important for clinical outcomes. Second, high-quality colonoscopy better ensures patient safety. Third, high-quality colonoscopy ties into patient satisfaction. Finally, reimbursement for colonoscopy is based on the quality of the procedure, as information on indicators needs to be submitted to ensure that the clinician is meeting the benchmarks.

G&H What are the fundamentals of a high-quality examination?

AS The key element is that the colonoscopy achieves its goal. For the vast majority of procedures, the goal is to detect any polyps that could potentially turn into cancer. In doing so, there are several parameters that fall onto the list of quality indicators. They are roughly divided into indicators that apply before, during, and after the procedure. Preprocedural indicators include elements such as choosing the correct indication, having an informed discussion with the patient about risks and benefits, and making sure that the equipment and other components are at hand in the room where the procedure will take place.

Intraprocedural indicators are likely the most important because the endoscopist is most responsible for them. These indicators include a number of questions. First, was the bowel preparation adequate to visualize and ensure a good examination? Second, was the examination completed to its intent—meaning, was the cecum or the cecal landmarks reached and photographed? Third, was enough time taken to inspect the lining of the colon in a high-quality examination—meaning, were the withdrawal time and the withdrawal technique adequate? Finally, was an adequate number of adenomas found to ensure that a thorough examination was performed?

Postprocedural quality indicators involve the complication rate, patient recovery, and patient experience. Every endoscopy center or hospital should have a robust system in place to track complications up to 30 days after the colonoscopy. For example, many units have staff call the patient. Similarly, patients may be surveyed to understand how satisfied they were with their procedure and if they have any suggestions for improvements.

G&H How has the 2015 update of colonoscopy quality indicators from the American Society for Gastrointestinal Endoscopy and the American College of Gastroenterology impacted outcomes?

AS Those indicators became the nidus to perform further research and ask whether they are tied to long-term

outcomes, such as reduction in the incidence of colorectal cancer. The answer was yes for several quality indicators, such as adenoma detection rate (ADR) and withdrawal time. One of the largest studies performed, which included 314,872 colonoscopies, tracked postcolonoscopy colorectal cancers among 136 endoscopists at Kaiser Permanente Northern California. ADRs ranged from 7.4% to 52.5%. During the follow-up period, 712 colorectal adenocarcinomas, including 255 advanced-stage cancers, were detected. A total of 147 deaths attributed to colorectal cancer were also recorded. The study found that endoscopists with an ADR in the lowest quintile (<17%) had twice the incidence of colorectal cancer among their patients compared with endoscopists with an ADR in the highest quintile (≥38). In fact, for each 1% increase in ADR, there was a 3% decrease in the risk of colorectal cancer.

Now, national benchmarks have been disseminated that define high-quality colonoscopy and determine reimbursement payouts. Adhering to meeting and exceeding these benchmarks will, in the long term, result in improved outcomes, such as reduction in the incidence of colorectal cancer. Data are now beginning to show that patients who undergo a high-quality colonoscopy are at reduced risk for colorectal cancer at 10 or even up to 15 years postprocedure. The data show that a thorough, high-quality examination is the basis of improved outcomes.

G&H What metrics are available to determine the quality of a colonoscopy?

AS There are several highly recommended metrics. One is bowel preparation. The quality of the preparation should be adequate in 85% or more of colonoscopies performed by an endoscopist to avoid having to repeat the procedure. Another metric is that the endoscopist should reach the cecum or the cecal landmarks—that is, perform a complete colonoscopy—in 90% of his or her colonoscopies. Again, it is imperative to ensure that a thorough inspection is performed.

The third metric is the ADR. Endoscopists must meet and exceed a minimum ADR of 25%, meaning that if they are performing colonoscopies in a given time period—for example, 100 colonoscopies performed across 6 months—they should detect at least 1 adenoma in 25 of those 100 patients and should likely try to exceed that rate.

The fourth metric concerns withdrawal time. The time spent inspecting the mucosa on the way back should be a minimum of 8 minutes. In addition, a good technique should be used that inspects behind folds and includes a very careful segmenting assessment.

G&H What key points should clinicians be aware of regarding advances in ADR benchmarks?

AS As mentioned, the ADR benchmark is 25%, but it is now being recognized as the minimum threshold. The truly aspirational goal is 50% or greater. Also, it is increasingly being understood that the ADR alone may be inadequate. Work is being done to develop newer quality indicators that are related to adenoma detection. Among these are adenomas per colonoscopy and adenomas per positive participant.

Published data have suggested that ADR may be insufficient to assess the quality of a colonoscopy because an endoscopist may be less inclined to identify and remove polyps after a single adenoma has been detected. In other words, the endoscopist identifies 1 adenoma, takes the attitude that the job is done, and does not proceed further. It is not adequate to just find 1 adenoma per patient. A second adenoma and perhaps even a third could be missed.

A study conducted at the University of Minnesota found that longer withdrawal time significantly correlated with higher ADR, adenomas per colonoscopy, and adenomas per positive participant (low vs high; $P<.001$). Endoscopists with high ADRs, adenomas per colonoscopy, and adenomas per positive participant were also more likely to be high detectors of sessile serrated adenomas and advanced adenomas (low vs high; $P<.001$).

G&H What resources are available for clinicians who want to improve their skills and better ensure quality control?

AS Fortunately, many useful resources are available, as are many different ways to improve skill sets. The value and outcomes of these efforts depend on how much time and cost a clinician wants to place on their application and performance optimization. It may be preferable to begin by choosing a skill that is easy and low cost to improve upon, such as withdrawal technique. Learning and applying a water exchange technique during the colonoscopy also is very useful. Another technique to boost thoroughness of an examination is to turn the patient so that different parts of the mucosa are exposed. All of these techniques are straightforward actions that can be done in the endoscopy suite.

Clinicians also may avail themselves of distal attachment devices that expose more mucosa. Pursuing continuing medical education as well as using resources that provide quality improvement feedback are also important. Clinicians should receive quality indicator report cards, understand where they stand compared with their

peers in a practice group or nationally, and then develop a plan of how to best improve their skill set. As for educational courses, online continuing medical education webinars and videos are available, and many gastroenterology specialty societies offer courses to help clinicians improve their technique.

G&H What innovative technologies are currently available to help improve the quality of colonoscopy?

AS All endoscopists should now be using higher-magnification colonoscopes. They also should be considering use of distal attachment devices. Such devices can be hooked onto the end of the colonoscope to help open up more parts of the mucosa and provide a better inspection of it. In addition, artificial intelligence (AI) technology is now approved by the US Food and Drug Administration and is available for use.

G&H How is AI impacting quality improvement regarding colonoscopy?

AS AI is the up-and-coming technology in this field, and it has a wide range of uses that can improve quality control. AI helps in the detection of polyps that can otherwise be missed. It helps size them, and it provides an objective measure to alert the endoscopist that the end of the colon has been reached. AI also holds the promise of better ensuring thoroughness in polyp removal. AI can help a clinician evaluate whether a polyp has been adequately resected. Future studies in this area will examine whether AI, along with either a distal attachment device or a colonoscope with a wider angle, can further enhance the ability to detect smaller or more subtle lesions and help the performance of higher-quality colonoscopies.

G&H What other innovations are in the pipeline?

AS In addition to AI, the other potential innovation is newer colonoscopes that have a wider angle of view to expose more mucosa. Such colonoscopes may even provide a 360-degree view that allows the endoscopist to look at the sides as well as what is in front and behind a visualized area. These are some of the exciting developments that may be seen in the next several years.

Disclosures

Dr Shaukat is a scientific consultant for Iterative Scopes, Freenome, and Medtronic.

Suggested Reading

Corley DA, Jensen CD, Marks AR, et al. Adenoma detection rate and risk of colorectal cancer and death. *N Engl J Med*. 2014;370(14):1298-1306.

May FP, Shaukat A. State of the science on quality indicators for colonoscopy and how to achieve them. *Am J Gastroenterol*. 2020;115(8):1183-1190.

Wang S, Kim AS, Church TR, Perdue DG, Shaukat A. Adenomas per colonoscopy and adenoma per positive participant as quality indicators for screening colonoscopy. *Endosc Int Open*. 2020;8(11):E1560-E1565.