EDITORIAL

Adenoma detection rate: in search of quality improvement, not just measurement

When patients have colonoscopy to detect neoplasia, they expect that the examination will be complete and accurate, that all polyps will be completely removed, and that the risk of subsequent colorectal cancer (CRC) will be very low. How does the patient know that he or she is receiving a high-quality colonoscopy? The most important quality measure is the rate of interval CRC within 5 years or before the next scheduled colonoscopy, an interval during which we would not expect new, de novo CRC to develop after all neoplasia have been completely removed. Measurement of interval CRC would require tracking systems that are not currently available in most settings. As patients transition to different health care systems and medical record systems, it is challenging for endoscopists to track a 5-year outcome—even an important outcome like interval CRC. Perhaps in the future we will have systems that enable us to track individual patients, but for now it is a distant dream. To measure colonoscopy quality, we are left with surrogate measures.

The adenoma detection rate (ADR) has been widely accepted by expert groups as an important colonoscopy quality measure. The adoption of this measure is based largely on 2 studies showing an inverse relationship between ADR and subsequent risk of CRC. Kaminski et al followed up patients after they had undergone screening colonoscopies in Poland. If the endoscopist had an ADR less than 20%, patients had a significantly higher risk of the development of an interval CRC than did patients who had undergone colonoscopies by an endoscopist with an ADR greater than 20%. Corley et al followed up a group of patients who had colonoscopies performed for screening, surveillance, and evaluation of symptoms. There was a strong relationship between lower ADR and higher risk of interval CRC. In that study, for every 1% increase in ADR there was a 3% decrease in interval CRC. The hazard ratio for interval CRC for endoscopists in the highest quintile of ADR (ADR >33.5%) was 0.52 (95% confidence interval, 0.39-0.69) relative to the lowest ADR quintile (ADR 7%-19%). Notably, this study included patients undergoing surveillance and evaluation of symptoms.

In a perfect world, in which all polyps are detected and completely removed at the baseline colonoscopy, interval CRC would be rare. Prior studies have suggested that the most common reason for interval CRC within 5 years of a baseline colonoscopy is missed lesions. Incomplete removal of polyps may be a factor in a smaller proportion of interval CRCs. It appears that ADR is a robust but cumbersome surrogate for interval CRC. The measure requires the linkage of endoscopy and pathology results. There is a relationship between the polyp detection rate (PDR) and ADR, and some have suggested that PDR could be an adequate substitute for ADR, which would be easy to measure. A study from Ontario has shown a relationship between PDR and the risk of interval CRC. However, gaming of reporting is a potential problem. Many patients have diminutive pale polyps in the rectosigmoid area, which are very obviously hyperplastic polyps and are often not removed in clinical practice. If PDR became a quality measure, every tiny bump might be removed and called a polyp.

If we agree that ADR is an important surrogate for interval CRC, how should it be measured? Expert groups have suggested that ADR should be derived from first-time screening examinations in average-risk individuals. This creates another potential obstacle to measurement in addition to the linkage of pathology. Systems must identify individuals undergoing average-risk screening and use only those patients for the analysis. For practices in which there is more surveillance and diagnostic colonoscopy, achieving an adequate number of screening examination could be a problem. Does it make a difference, or can all types of procedures for which the primary objective is detection of neoplasia be merged to calculate ADR?

Several studies have used mixed populations of patients undergoing screening, surveillance, and diagnostic

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colonoscopies. In a recent survey of nearly 1.4 million colonoscopies in the United States, the rates of finding large polyps (a surrogate for advanced neoplasia) varied on the basis of indication, age, and sex. Although there may be differences, the overall ADR may not be significantly altered by the patient mix, and it may still be an important quality measure. In the study by Corley et al demonstrating a dramatic relationship between ADR and interval cancer, patients undergoing all types of colonoscopies were included.

The current study by Marcondes et al analyzed more than 20,000 colonoscopies in a practice of 11 gastroenterologists. The overall ADR was 35.9% with no exclusions. The authors applied various exclusions and found that depending on the specific exclusion, ADR changed by −4.6% to +5.1%. The key point is that for any individual endoscopist there was no change in their ranking relative to other endoscopists when exclusions were applied.

The demographic mix may be far more important than the procedure indication for calculation of ADR. Age and sex really do make a difference. Practices with predominantly younger (50- to 60-year-old) women will have lower ADRs than will those with older men. It may make more sense to calculate ADR by sex and age than by indication.

As the authors propose, it may be reasonable to exclude examinations that are not clearly related to cancer prevention because the ADR is a measure related to preventing interval CRC, thus minimizing exclusions. The inclusion of patients undergoing screening and polyp surveillance makes sense from this standpoint. Patients undergoing colonoscopy for the evaluation of certain symptoms (rectal bleeding) might also be included because a primary aim is to rule out neoplasia. According to the Clinical Outcomes Research Initiative data (1.4 million colonoscopies), this comprises more than 80% of all colonoscopy examinations.

If the ADR is monitored by an endoscopist with a relatively stable mix of patients, the measurement can also be a meaningful quality improvement tool for that endoscopist. In the new study by Abdul-Baki and colleagues, 9 endoscopists were monitored before and after the initiation of public reporting ADR rates. Bottom line: the rates for ADR and advanced neoplasia improved. ADR increased in the postpublic report period by 4% to 17%. Perhaps more important than overall ADR was the finding that advanced adenoma detection also increased from 10% to 12.7% in the 2 periods. Because this was a before-and-after type of study, there are several possible areas for bias. When individuals know that their performance is being measured, there may be test improvement. If the topic of interest is the impact of public reporting, a randomized study of practices would be a more ideal study design. This study was limited to 1 practice and may not be representative of other types of practices. The study was confounded by other factors, including a change in bowel preparation regimen (to split-dose), the introduction of electronic reporting (which may have improved documentation), and individual monthly feedback on ADR. We do not know whether there was also technical improvement with high-definition instruments, which may have an impact on ADR. Therefore, it is not clear whether public reporting alone really accounted for the difference.

Nevertheless, we can take away several important lessons from this study. ADR is complex, and performance is related to many of the factors just noted. Although it is important to have a benchmark threshold for “acceptable” performance, it may be more important to follow and document ADR over time as a quality improvement tool for each endoscopist. There will be variations based on patient demographics and procedure indications—and that is all right. If ADR is monitored over time, the impact of various types of interventions (such as changes in bowel preparation, colonoscopy equipment, comparative reporting, and public reporting) can be evaluated at an individual level. If ADR rates start to fall, individuals will be aware, and they can examine whether the decline results primarily from practice demographics or from other factors.

Other aspects of ADR measurement need more discussion and research. Is it sufficient to measure the detection of 1 adenoma when many patients have 2 or more? There has been speculation about a “one and done” phenomenon, in which endoscopists may be less vigilant after they find their first adenoma. Is it really important to find 3-mm adenomas, or should we be focusing on pathologic structures more likely to develop into malignancy over time? Evidence that diminutive polyps rarely harbor significant pathologic features has raised questions about their clinical importance. Perhaps we should be focusing our quality measure on lesions of greater import—polyps 6 mm or larger, or 10 mm or larger. And what about serrated polyps, currently not included in the traditional calculation of ADR? Such measurements would require a large number of procedures to generate robust, reproducible data, but if 80% of colonoscopies are included, that might be possible.

This is an exciting time for medicine. We are focusing on the quality of the health care we deliver. For colonoscopy, we rely on surrogate measures of quality, which are linked to important endpoints—bowel preparation quality, cecal intubation rate, and ADR. When electronic systems can enable long-term follow-up, we may be able to transition to the endpoints we really need to measure: rates of interval cancer and 30-day adverse events. For now, it makes sense to calculate ADR for all examinations in which detection of neoplasia and cancer prevention is the primary goal, and use the ADR as a quality improvement tool.
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Abbreviations: ADR, adenoma detection rate; CRC, colorectal cancer.

REFERENCES


Registration of Clinical Trials

Gastrointestinal Endoscopy follows the International Committee of Medical Journal Editors (ICMJE)’s Uniform Requirements for Manuscripts Submitted to Biomedical Journals. All clinical trials eventually submitted to GIE must have been registered through one of the registries approved by the ICMJE, and proof of that registration must be submitted to GIE along with the article. For further details and explanation of which trials need to be registered as well as a list of ICMJE-acceptable registries, please go to http://www.icmje.org.