



Adenoma Detection Rate as a Quality Metric: Is It Really Out of the Endoscopists' Hands?

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Colorectal carcinoma is the third most common cancer in the USA. While colonoscopy is widely recognized as the “gold standard” screening test, it is far from perfect. Although colonoscopy is effective at reducing rates of distal colon cancers, it has been less successful in preventing colon cancer incidence and the mortality accruing from undiagnosed proximal colon lesions. Furthermore, a negative colonoscopy may not safeguard a patient until their next screening exam as interval colon cancers occur. A high-quality screening colonoscopy involves intubation of the entire colon and a diligent inspection of all mucosa with complete removal of all neoplastic lesions. Nevertheless, each exam is only as good as the endoscopist performing it. Given the variability among endoscopists, quality benchmarks are necessary in order to improve outcomes and to standardize high-quality patient care.

Gastroenterologists are familiar with the quality indicators used to rate the quality of screening colonoscopy. One robust quality metric is the adenoma detection rate (ADR), the proportion of screening exams in patients over age 50 in which one or more adenomas are removed. The quality standard is a combined ADR of at least 25% (30% for male patients and 20% for females). Higher ADRs are associated with improved outcomes, including reduced colorectal cancer incidence and mortality rates. Patient, physician-related, and procedural factors influence ADR. Male gender, increasing age, tobacco use, obesity, and diabetes are all associated with an increased risk of adenoma development. There is often significant variability in ADR performance among gastroenterologists, suggesting that physician- and procedure-related factors exist that could influence ADR. The search for relevant factors has generated a number of

studies looking for a means to enhance ADR and the effectiveness of colonoscopy.

This issue of *Digestive Diseases and Sciences* includes one such study by Cavicchi et al. [1]. They conducted a retrospective single-center study in order to identify patient and physician factors associated with the ADR and with sessile polyp detection rates (SPDR). Their study group included 11,682 patients who underwent colonoscopy over a 2-year period. This group of consecutive colonoscopy patients included those with a positive FIT, patients under age 50, and those with a personal history of colon cancer or colon polyps. Their group had 30 physicians of which most were male and had ≥ 20 years of experience.

As with all other groups who have published on ADR, there was a wide range within their physician group (15–44%; mean $27.4 \pm 7.3\%$). SPDR was also extremely variable (0–16%; mean $7.8 \pm 4.4\%$). Univariate analysis identified several well-recognized factors such as patient gender, age, and indication (positive FIT) that were predictably and significantly associated with high ADR and SPDR. Nonetheless, with multivariate analysis, the number of significant shared factors between these two rates collapsed to only two: personal history of colon cancer/polyps (positive correlation) and a procedure indication for digestive symptoms (inverse correlation) for polyp detection. Interestingly, none of the physician-related factors significantly affected ADR in their analysis.

Also, striking was the absence of shared demographic predictors for ADR and SPDR. Male gender and increasing patient age were not associated with SPDR, suggesting that serrated polyp formation differs significantly from the factors that drive the traditional adenoma to carcinoma pathway. The fact that scope withdrawal time was not associated with ADR, but was associated with SPDR is curious. Finally, the finding that low-volume endoscopists had higher SPDR is also somewhat perplexing. The authors speculate that since the physicians with a lower case volume had more time to complete the exams, there was sufficient time to find

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serrated polyps. This finding is contrary to the general trend in the literature that both ADR and SPDR are positively associated with longer withdrawal times [2].

While the study by Cavicchi et al. is larger than many single-center studies, there is still only a modest number of participating endoscopists (30) performing a relatively low median volume of cases over 2 years (264 with one endoscopist only doing 15 colonoscopies over 2 years). Hence, there are wide confidence intervals around detection rates using the median number of cases, $\pm 5.5\%$ around ADR and $\pm 3.3\%$ around SPDR, which limits reliable assessment of both rates. There is also a heterogeneity of indications, with screening exams comprising only 5% of the total, with nearly one-third being surveillance exams and follow-up of positive FIT. One could argue that ADR in this higher-risk patient population should have been greater than screening benchmarks. We also find it interesting that mean insertion times seemed prolonged at 7 min, especially relative to mean withdrawal time of only 8.3 min.

There are a host of factors that can influence polyp detection rates during colonoscopy and more are being evaluated with time. Yet, most of the literature is focused on ADR with only a recent uptick of studies on SPDR. An impediment to determining factors associated with SPDR is the only recent widespread recognition of serrated adenomas/polyps and the greater variability in serrated polypectomy specimen interpretation among pathologists [3, 4]. Nevertheless, recent work has suggested that physician factors affect SPDR as academic gastroenterologists had higher rates than both community gastroenterologists and colorectal surgeons with formal training in colonoscopy; the three groups had comparable ADRs [5]. Although one would expect that greater endoscopic experience would improve detection rates, studies have shown mixed results [5, 6]. What may also seem counterintuitive is that the factors influencing ADR do not translate to SPDR. Procedural factors including examining the proximal colon twice (or cecal retroflexion) and the frequent use of electronic chromoendoscopy in this segment may prove to be more important for SPDR-related benchmarks in the near future than they have been for ADR [7].

Despite the limited understanding of the physician factors that drive detection rates and an unclear path toward developing training aimed at improving neoplastic polyp detection, multiple new technologies or endoscope attachments have been marketed to enhance polyp detection. Yet, initial reports showing benefit all too frequently lack subsequent confirmation. Overall, the enhancements have demonstrated mixed success with most showing little benefit over low-cost low-tech interventions such as water instillation, the use of second observers, and changes in position during withdrawal [8]. An exception may be narrow-band imaging (NBI) that has recently been reassessed, with a greater benefit realized from the second-generation version of this

form of electronic chromoendoscopy [3]. But, even the latest technology is undermined by the most basic of necessities, adequate bowel preparation.

Perhaps factors that have not yet been analyzed are important in neoplastic polyp detection such as percentage of time NBI is activated during withdrawal, frequent assessment of visual acuity of the endoscopist and actual time spent examining mucosa during withdrawal versus time spent cleaning or removing residual fluid. There is even a recent study to suggest that physician personality may play a role in determining ADR [9].

All of this interest in improving polyp detection is encouraging as endoscopists strive to maximize the impact of colonoscopy on colon cancer detection and prevention. Still, any preliminary report needs to be weighed with caution until confirming studies are conducted. Several endoscopist features associated with ADR may have been due to confounding factors that influence polyp prevalence such as patient comorbidities, medications, and procedural factors [10]. Until more is learned, split preps, adequate withdrawal time (far more than 6 min), regular reporting of ADRs and SPDRs to individual endoscopists, and the generous use of NBI during meticulous mucosal examination are worthy peri-procedural and procedural habits to cultivate.

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