



## It's not lack of evidence holding back resect and discard

Optical diagnosis (OD) refers to histology prediction based on endoscopic features. OD has several potential uses in colonoscopy (Table 1). The most transformative potential use of OD in colonoscopy is to alter the management of diminutive colorectal polyps. In 2011, the American Society for Gastrointestinal Endoscopy (ASGE) proposed 2 practice strategies using OD to reduce risk and/or cost associated with endoscopic resection of diminutive polyps, accompanied by minimum OD performance thresholds at which the strategies would be accepted for implementation.<sup>1</sup>

One proposed practice strategy is the “diagnose and leave” strategy for hyperplastic rectosigmoid diminutive polyps. The recommended threshold for OD performance of  $\geq 90\%$  negative predictive value for adenomatous histologic features is easily met,<sup>2</sup> in part because about 85% of diminutive rectosigmoid polyps are nonadenomatous.<sup>3</sup> The diagnose and leave strategy is not radical, given that nearly all experienced colonoscopists already practice it to some extent. The second and radical proposal is “resect and discard,” which envisions diminutive polyps having their histologic features predicted by OD and then resected and thrown away without pathologic evaluation. The concept of resect and discard remains a major paradigm shift from the widespread practice of submitting all tissue resected by endoscopy to pathologic analysis. The ASGE recommended that for OD use to be acceptable in a resect and discard paradigm, the agreement in assigned postpolypectomy surveillance intervals based on OD should have  $\geq 90\%$  agreement with intervals based on diagnoses derived from pathologic examination.

Meta-analyses and systematic reviews, including 1 performed by the ASGE Technology Assessment Committee,<sup>2</sup> found that various forms of electronic chromoendoscopy-based OD allowed surveillance interval predictions above the recommended ASGE thresholds. This led to endorsement of the resect and discard practice by the ASGE and also by the European Society for Gastrointestinal Endoscopy<sup>4</sup> and the National Institute for Health and Care Excellence.<sup>5</sup> Despite these endorsements, the resect and discard paradigm is seldom practiced in the United States.

In this issue of *Gastrointestinal Endoscopy*, Ahmad et al<sup>6</sup> present the DISCARD 3 study results. Based in the United Kingdom Bowel Cancer Screening Program, 8

certified endoscopists performed OD on 1560 polyps  $< 10$  mm. Assuming that resect and discard would be used for lesions  $\leq 5$  mm, OD based on narrow-band imaging (NBI) provided surveillance interval concordance of 91.3%, 98.3%, and 98.7% by use of the guidelines from the U.S. Multi-Society Task Force, the European Society for Gastrointestinal Endoscopy, and the British Society of Gastroenterology, respectively. Thus, DISCARD3 provides more evidence that resect and discard is an appropriate paradigm for clinical practice.

DISCARD3 follows on the previously published DISCARD2 study, in which 28 community-based endoscopists in the United Kingdom received training in OD but overall failed

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to achieve adequate accuracy.<sup>7</sup> In a redesign of the unsuccessful DISCARD2, the DISCARD3 investigators established an extensive protocol of training, monitoring, and feedback to the study endoscopists (Table 2). This protocol is so comprehensive that it renders the process unfeasible for most of the world, including most practices in the United States. However, from previous studies that did not implement training and monitoring protocols this extensive, there is overall ample evidence that expert endoscopists can achieve the ASGE-recommended OD performance thresholds.<sup>2</sup>

As noted above, in clinical practice in the United States, almost no endoscopists, including experts, actually practice resect and discard. The success of DISCARD3 is unlikely to change this. DISCARD3 is more likely to advance resect and discard in the United Kingdom, where the technical aspects of colonoscopy performance are easier to mandate and fund, particularly when procedures are performed within the purview of the organized Bowel Cancer Screening Program. However, in the United States and in some other countries, implementation of resect and discard is impeded by 2 factors having nothing to do with evidence.

One of these factors is the perceived medical-legal risk associated with resect and discard. Whereas nearly all endoscopists would agree that the risk of invasive cancer in

**TABLE 1. Uses of optical diagnosis in colonoscopy**

Clinical use	Currently in use in United States?
• Resect and discard	Rarely
• Differentiate SSLs from lateral spreading lesions to guide cold (SSL) versus hot (adenoma) resection	Yes
• Predict deep submucosal invasion based on NICE 3/Kudo 5	Yes
• Leave distal hyperplastic polyps in place	Yes
• Evaluate resection scars to differentiate residual polyp from clip artifact	Yes

NICE, Narrow-band imaging International Colorectal Endoscopic classification; SSL, sessile serrated lesion.

**TABLE 2. Methods used in DISCARD 3 that may be difficult to reproduce entirely or partly in clinical practice**

• 8 endoscopists certified in the Bowel Cancer Screening Program
• All endoscopists with prior experience with NBI
• Formal training program in NBI
• Regular comprehensive feedback based on performance
• White light and NBI photos of every polyp
• Up to 3 recuts when high confidence diagnoses are not confirmed by pathologic analysis

DISCARD, Detect Inspect Characterize Resect and Discard; NBI, narrow-band imaging.

diminutive polyps is so low as to be viewed as essentially negligible,<sup>8</sup> interval cancers are a reality. When an interval cancer occurs, the exact cause is typically difficult to pinpoint. The most likely cause involving possible physician error is a missed lesion, but the literature supports an incompletely resected lesion as a potential cause, and adoption of resect and discard creates a third potential cause of a thrown away (and thus unrecognized) cancer that recurred.

A second factor impeding the implementation of resect and discard is that the paradigm involves time expenditure and financial costs for which there is no remuneration to endoscopists (Table 3). When medical-legal risk is combined with the costs required for training, monitoring endoscopist performance, reporting performance, and getting consent from patients,<sup>9</sup> endoscopists lose interest. Even in the setting of salaried endoscopists and a self-contained health-care system covering the costs of both endoscopy and pathologic analysis, the cost savings of reduced pathology fees arising from resect and discard would be weighed against the cost of constructing and maintaining the endoscopic OD program (Table 2). Resect and discard is only 1 of several potential advancements in colonoscopy practice where lack of logical reimbursement policy is delaying evidence-based, cost-effective approaches to colonoscopy care (Table 4).

These practical barriers to implementation of resect and discard persist, even while several factors are actually making resect and discard appear increasingly feasible from a scientific perspective. For example, the simplification of European and British postpolypectomy surveillance guidelines

**TABLE 3. Impediments to resect and discard in United States practice**

• OD takes extra time (electronic chromoendoscopy, close focus)
• OD requires photodocumentation or video recording for support
• OD confounds measurement of adenoma detection rate
• No reimbursement available for OD
• Perceived medical-legal risk associated with discarding cancer
• No cost coverage for quality assurance program of OD implementation
• Potential resistance from patients; need for additional informed consent
• Endoscopists owning pathology laboratories with incentives to separate polyps into more bottles
• Endoscopists owning pathology laboratories have actual <i>disincentive</i> to initiate resect and discard

OD, Optical diagnosis.

is driving concordance in surveillance between OD and pathologic analysis to very high levels.<sup>6</sup> Although seldom used in the United States, the option of simplified surveillance (eg, 10 years for 1 or 2 adenomas <10 mm) is already available.<sup>10</sup> Second, computer-aided diagnosis, or artificial intelligence programs that predict histologic features, have performed as well as expert endoscopists<sup>3</sup> and could overcome the uncertainties posed by poor performance of community-based endoscopists in OD. Third, more systematic use of endoscopic photography, and even routine video recording and cloud storage, allow enhanced documentation of endoscopist decision making (and thereby medical-legal protection). Fourth, evidence is mounting that pathologic diagnoses of diminutive polyps are not a gold standard. Several studies, including DISCARD3, demonstrate that relying on pathologic analysis for diminutive polyps is flawed by tissue fragmentation and sectioning through normal tissue adjacent to polyps. Finally, and most importantly, resect and discard rests fundamentally on the increasing widespread recognition and agreement that the risk of submucosally invasive cancer in diminutive colorectal polyps is essentially negligible.<sup>8</sup>

In summary, DISCARD3 builds on the extensive evidence that recommended thresholds for OD performance in resect and discard can be met by at least some endo-

**TABLE 4. Examples where colonoscopy best practice and/or cost-effective practice are impeded by reimbursement policy**

• Resect and discard not yet implemented
• Physician-directed sedation replaced by anesthesia services
• Only first polypectomy reimbursed, incentivizing “one and done”
• No CPT code for endoscopic submucosal dissection
• No reimbursement for ancillary detection devices (distal attachments, artificial intelligence)

CPT, Current Procedural Terminology.

scopists. Changes in postpolypectomy surveillance guidelines, the development of computer-aided diagnosis, and increasing recognition that diminutive polyps are almost never malignant are making resect and discard an increasingly logical, cost effective, and much saner approach to the many millions of diminutive colorectal polyps removed annually during colonoscopy. Despite this, practical impediments to resect and discard remain real obstacles to progress. We can't expect colonoscopists to embrace the burden of resect and discard with its added procedure time, cost, and perceived risk without compensation. It's time to turn energies and ingenuity toward overcoming these practical impediments to new paradigms in colonoscopy practice. They are what is holding up resect and discard, along with other endoscopic advances in colonoscopy.

## DISCLOSURE

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Abbreviations: ASGE, American Society for Gastrointestinal Endoscopy; NBI, narrow-band imaging; OD, optical diagnosis.

## REFERENCES

1. Rex DK, Kahi C, O'Brien M, et al. The American Society for Gastrointestinal Endoscopy PIVI (preservation and incorporation of valuable endoscopic innovations) on real-time endoscopic assessment of the histology of diminutive colorectal polyps. *Gastrointest Endosc* 2011;73:419-22.
2. ASGE Technology Committee; Abu Dayyeh BK, Thosani N, Konda V, et al. ASGE Technology Committee systematic review and meta-analysis assessing the ASGE PIVI thresholds for adopting real-time endoscopic assessment of the histology of diminutive colorectal polyps. *Gastrointest Endosc* 2015;81:502 e1-16.
3. Weigt J, Repici A, Antonelli G, et al. Performance of a new integrated computer-assisted system (CADe/CADx) for detection and characterization of colorectal neoplasia. *Endoscopy* 2022;54:180-4.
4. Kaminski MF, Hassan C, Bisschops R, et al. Advanced imaging for detection and differentiation of colorectal neoplasia: European Society of Gastrointestinal Endoscopy (ESGE) guideline. *Endoscopy* 2014;46:435-49.
5. National Institute for Health Care Excellence. Virtual chromoendoscopy to assess colorectal polyps during colonoscopy. Available at: <https://www.nice.org.uk/guidance/dg28>. Accessed August 27, 2022.
6. Ahmad A, Moorghen M, Wilson A, et al. Implementation of optical diagnosis with a “resect and discard” strategy in clinical practice: DISCARD3 study. *Gastrointest Endosc* 2022;96:1021-32.
7. Rees CJ, Rajasekhar PT, Wilson A, et al. Narrow band imaging optical diagnosis of small colorectal polyps in routine clinical practice: the detect inspect characterise resect and discard 2 (DISCARD 2) study. *Gut* 2017;66:887-95.
8. Ponugoti PL, Cummings OW, Rex DK. Risk of cancer in small and diminutive colorectal polyps. *Dig Liver Dis* 2017;49:34-7.
9. Sakata S, Lee AHS, Kheir AO, et al. Patient acceptance of the optical diagnosis and misdiagnosis of diminutive colorectal polyps. *Gastrointest Endosc* 2017;86:372-5.e2.
10. Gupta S, Lieberman D, Anderson JC, et al. Recommendations for follow-up after colonoscopy and polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer. *Gastrointest Endosc* 2020;91:463-85.e5.