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Colorectal Cancer Control Where Have We Been and Where Should We Go Next?

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Colorectal cancer (CRC) is the second leading cause of cancer death in the United States, but it does not have to be. Screening prevents CRC by finding precancerous lesions so they can be removed before they become cancerous. Screening can also detect CRC early and, when CRC is localized, 5-year survival is over 90%, with many patients cured. Five-year survival for late-stage CRC, however, is less than 20%.¹

Colorectal cancer screening rates have been steadily increasing in the United States, yet only 62% of age-eligible adults are up-to-date for CRC screening.² Rates are lower among low-income (47%), uninsured (25%), African American (59%), Asian (52%), Native American (48%), and Hispanic (47%) populations.² These rates fall short of the 70% and 80% targets for Healthy People 2020 and National Colorectal Cancer Round Table. Net health care costs in the first year after CRC diagnosis range from \$36 000 for stage I to \$74 000 for stage IV disease.³ Colorectal cancer survivors also experience high out-of-pocket costs and lost productivity.⁴ In short, optimal and equitable CRC screening would improve health outcomes and produce cost-savings.⁵

In pursuit of optimal and equitable CRC control, multiple federal agencies, advocacy groups, and initiatives (eg, from the National Cancer Institute, Centers for Disease Control and Prevention, American Cancer Society) have sponsored numerous trials and experimental studies testing strategies to increase CRC screening uptake. While this research gives us a broad evidence base, it has led to a situation in which we have almost too much information. Policymakers, public health agencies, health care organizations, researchers, and other stakeholders might be better served by synthesizing the information that is already available. That approach might answer questions, such as: Which screening uptake strategies are most effective, in what settings, and for whom? Which strategies are ineffective and need no further study? What research gaps remain?

In this issue of *JAMA Internal Medicine*, Dougherty et al⁶ publish a systematic review and meta-analysis comparing the effectiveness of randomized clinical trials to increase CRC

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screening and follow-up. This was an ambitious project, with the authors reviewing 2123 unique abstracts and 104 full-text articles, yielding 92 randomized clinical trials that included 457534 patients. Most trials addressed initial CRC screening uptake, with only 13 investigating repeat screening and 6 evaluating interventions to increase follow-up colonoscopy after an abnormal fecal blood test (FBT) result.

In brief, interventions to increase CRC screening uptake that were consistently effective included FBT outreach (net increase, 22%) and patient navigation (especially when navigation included FBT provision; net increase, 11% without FBT vs 18% with FBT provision). Patient education alone appeared to have a small association with few differences between education type or delivery mode, unless education was combined with another intervention, such as the ability to request FBT. Clinician-directed interventions were associated with a net screening increase of 10% for academic detailing (1- on-1 clinician training) and 13% with point-of-care reminders during patient visits. Multicomponent, multilevel interventions were consistently effective (relative risk [RR], 1.92; 95% CI, 1.69–2.19)-but only minimally more so than single-component interventions alone (multi-vs single RR, 1.18; 95% CI, 1.09–1.29). Dougherty et al⁶ also did a thorough search of registered clinical trials and abstracts and used funnel plots to assess publication bias. They rated the evidence strength, with high scores for FBT outreach and navigation. Study time also mattered: studies with shorter follow-up had larger net benefit, probably because usual care that opportunistically offered screening at clinic visits did not have enough time to catch up.

Very few studies evaluated interventions to increase colonoscopy follow-up after an abnormal FBT result, although some evidence suggested that navigation and clinician-directed interventions led to moderate increases. However, the strength of the evidence was low. Follow-up diagnostic colonoscopy rates were suboptimal, particularly in community health clinics that care for disadvantaged populations.⁷ Lack of follow-up colonoscopy defeats the purpose of an FBT screening program because early-stage cancers go undetected when they are most treatable. Also notable in the meta-analysis was the lack of sufficient studies to assess optimal strategies for increasing adherence long-term, which is important because FBT is recommended annually.

This meta-analysis had limitations. Patient phenotypes were not assessed, so interventions might have had differential effects on subgroups, particularly among disadvantaged populations with low CRC screening rates and worse CRC outcomes. Patient-level data analysis could lead to the identification of individuals most likely to respond to specific strategies, enabling targeted, more cost-effective interventions. Intervention settings, populations recruited, and implementation processes varied, and addressing these contextual factors is critical to dissemination and implementation. Knowing that an intervention is effective in a highly controlled research setting does not guarantee local or widespread adoption. Strategies for improving population care need to be feasible, acceptable, and compatible with the fast-paced, complicated processes of providing day-to-day health care to patients and resources that are available to clinicians and within organizations.

Dissemination and implementation science is a developing field devoted to understanding factors in adoption of evidence-based interventions and testing different strategies for improving the integration of these interventions into practice. Implementation barriers and facilitators are generally multilevel and multifactorial, and external factors, such as policies, affect efforts to increase CRC screening. The percentage of eligible adults screened for CRC is 1 of 40 metrics used to rate health plans for Medicare's 5-star program. Medicare Advantage Plans achieving a higher star rating receive additional reimbursement and other benefits. Health plans participating in Medicare Advantage or similar programs are motivated to increase CRC screening rates and often use a variety of evidence-based (and sometimes nonevidence-based) approaches to increase CRC screening uptake. Kaiser Permanente in California achieves CRC screening rates well above the National Colorectal Round Table CRC goal of 80% by 2018 by mailing more than 500 000 FIT kits annually.⁸ Unfortunately, US quality metrics do not collect follow-up colonoscopy rates after a positive CRC test result, which could spark interest in an understudied and persistent gap in CRC cancer control. Ultimately, the metrics that could drive implementation and matter most are rates of CRC, stage at diagnosis, and mortality—data that are already collected across states and counties, but are not compared across health plans.

Additional barriers to achieving CRC control are costs and availability of colonoscopy. While the Affordable Care Act mandated that insurance plans cover CRC screening tests in full, with no patient out-of-pocket costs, coverage does not apply to colonoscopies that convert from screening to diagnostic when a polyp is removed or diagnostic colonoscopies after a positive FBT result. This coverage failure means that patients may have to pay thousands of dollars to complete recommended CRC testing.⁹

The Dougherty et al⁶ analysis can and should inform decision makers. We can now safely say that, in general, no more studies are needed to demonstrate that outreach with FBT and patient navigation increase CRC screening. Instead, we need research in other areas of the CRC control continuum, including how best to implement evidence-based strategies and adaptations needed for different settings and populations, how to ensure follow-up after a positive CRC test result, what interventions increase adherence to ongoing CRC screening, and ultimately, what association CRC control programs have with CRC incidence, mortality, and health equity.

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