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Optimizing tracking and completion of follow-up colonoscopy after abnormal stool tests at health systems participating in the Centers for Disease Control and Prevention's Colorectal Cancer Control Program

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Abstract

Purpose—We present findings from an assessment of award recipients' partners from the Centers for Disease Control and Prevention's Colorectal Cancer Control Program (CRCCP). We describe partners' processes of identifying and tracking patients undergoing stool-based screening.

Methods—We analyzed data from eight CRCCP award recipients purposively sampled and their partner health systems from 2019 to 2023. The data included number of stool-based tests distributed and returned; abnormal findings; referrals and completion of follow-up colonoscopies; and colonoscopy findings. We also report on strategies to improve tracking of stool-based tests and facilitation of follow-up colonoscopies.

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Ethics approval Institutional Review Board approval was not required because it was determined this study was not research involving human subjects.

Results—Five of eight CRCCP award recipients reported that all or some partner health systems were able to report stool test return rates. Six had health systems that were able to report abnormal stool test findings. Two reported that health systems could track time to follow-up colonoscopy completion from date of referral, while four could report colonoscopy completion but not the timeframe. Follow-up colonoscopy completion varied substantially from 24.2 to 75.5% (average of 47.9%). Strategies to improve identifying and tracking screening focused mainly on the use of electronic medical records; strategies to facilitate follow-up colonoscopy were multi-level.

Conclusion—Health systems vary in their ability to track steps in the stool-based screening process and few health systems can track time to completion of follow-up colonoscopy. Longer time intervals can result in more advanced disease. CRCCP-associated health systems participating in this study could support the implementation of multicomponent strategies at the individual, provider, and health system levels to improve tracking and completion of follow-up colonoscopy.

Keywords

Colorectal cancer; Screening; Colorectal cancer tracking; Follow-up colonoscopy; Follow-up of abnormal stool tests; Cancer screening programs

Background

Colorectal cancer (CRC) screening is instrumental in reducing CRC-related mortality [1]. Until 2021, screening for CRC was recommended starting at age 50; however, the United States Preventive Services Task Force (USPSTF) lowered the recommendation to age 45 [2]. For people ages 45–75, the most recent data from the 2021 National Health Interview Survey show that 58.7% were up to date with CRC screening [3]. CRC screening rates vary by race and ethnicity, age group, insurance status, as well as education, income, and location of care [3, 4].

Stool-based tests are one type of CRC screening modality. These include fecal occult blood tests (FOBT) and fecal immunochemical tests (FIT), both of which need to be completed annually according to the USPSTF guidelines [2]. The multi-target stool DNA test (Cologuard; FIT-DNA) is recommended to be completed every 1–3 years [5]. Because of barriers, such as long wait times for screening colonoscopy appointments, travel, distance to providers, and bowel prep [6-8], stool-based tests may be a more readily available screening option. Mailed FIT programs have also been shown to be effective in overcoming CRC screening barriers [9].

Stool-based tests require timely follow-up with colonoscopy (“follow-up colonoscopy”) to complete the screening process if the initial stool test is abnormal [2]. A recent systematic review showed that the time interval should be no longer than 9 months, as the incidence of CRC and advanced stage diagnosis increases with time between stool test and follow-up colonoscopy [10]. However, the percentage of people completing follow-up ranges widely; studies have indicated that between 15.4 and 95.2% of patients complete a follow-up colonoscopy within 6 months [11-15].

Many health systems and clinics, including FQHCs, have challenges in identifying patients eligible for CRC screening and tracking results. Systems and clinics may be unable to track patients who need follow-up colonoscopies because their electronic medical record system (EMR) is not configured to track or link abnormal stool-based tests in a systematic way that triggers a clinician's referral for a follow-up colonoscopy [16]. Patients need to visit either a hospital or endoscopy center for the follow-up appointment, which facility (i.e., clinic or procedure center) takes on the responsibility for making sure the patient has an appointment is often unclear. Further, these external facilities may not use the same EMR as the clinic or have a health information exchange in place, so there is no seamless electronic linkage between systems [17]. When any of these happen, it becomes much more labor intensive for clinics to monitor status of appointments, as well as obtain and document results of follow-up colonoscopies.

The Centers for Disease Control and Prevention funds the Colorectal Cancer Program (CRCCP). The CRCCP currently consists of 35 award recipients across the USA to promote CRC screening for age-eligible and uninsured or underinsured patients through the implementation of evidence-based interventions (e.g., patient and provider reminders, provider assessment and feedback, activities to reduce structural barriers, and patient navigation) [18]. The award recipients are made up of 20 state health departments, 8 universities, 2 tribal organizations, and 5 other types of organizations (e.g., an FQHC, a hospital), who often partner with FQHCs. In this paper, we report on the extent to which a sample of health systems, that award recipients' partner with, provide support along the continuum of CRC screening to facilitate the completion of the screening episode. We also summarize the challenges and identify strategies that health systems can use to mitigate barriers in tracking data and improving completion of recommended follow-up colonoscopies.

Methods

The eight participating award recipients in this study are a part of the CRCCP Learning Collaborative, a subset of 21 CRCCP award recipients that assess the implementation, effectiveness, and cost of interventions [19]. Members of the Learning Collaborative participate in CDC CRCCP special studies and provide data to generate evidence based on their real-world practices. The eight participating award recipients in this study were selected through a purposive sampling process, using elements that included geographic diversity (and included all U.S. Census Regions) and ability to report data on tracking stool-based test screenings and their outcomes.

We introduced the study to the eight award recipients on videoconference calls in 2023 to gauge their interest in taking part. We provided data collection spreadsheets that the award recipients completed on behalf of their health systems and returned via email. Award recipients were asked to select representative health systems from among those who were participating in the CRCCP. The one inclusion criterion was that the health system had to have the ability to track colorectal cancer screening at some level and provide the requested data. Award recipients provided the sociodemographic characteristics of the CRC screening-eligible populations at the health systems. We report details on sex, race/ethnicity,

and the proportion uninsured. We also report the overall screening uptake. Recipients also provided screening and follow-up colonoscopy outcomes data, and we calculated stool test return rates, percentage of abnormal FIT results, CRC screening uptake, and percentage of follow-up colonoscopies completed. We defined stool tests as the sum of FOBT, FIT, and FIT-DNA tests. The data were analyzed and managed in Microsoft Excel.

The reporting periods used by the award recipients in most instances were the same for demographics and outcome measures. However, three award recipients reported different time periods for demographics and outcome measures because of the lag in implementation. The years for reporting demographics ranged from 2019 to 2022 and for outcomes ranged from 2020 to 2022. The outcome measures were reported for their baseline periods, which we defined as the time immediately prior to the introduction of any strategies to improve the reporting of screening measures.

We also examined whether award recipients were able to track patients at various stages along the CRC screening continuum and what processes health systems had in place to track patients with abnormal stool tests through follow-up colonoscopies. Although the main focus of our assessment was on follow-up colonoscopy, we included the full screening episode to assess the overall ability of health systems to track screening data. First, if the data collection had flaws in the initial screening steps, then the number of patients identified with abnormal stool test findings may not be accurate. Second, similar data issues may impact quality of information available along more than one step in the screening continuum and, thus, these issues may have to be addressed in tandem. Data are reported at the award recipient level and an average was calculated when multiple health systems were included for an award recipient.

Additionally, we conducted in-depth interviews by videoconference with stakeholders from each award recipient to learn more about their current processes as well as the barriers and challenges the health systems faced in tracking follow-up colonoscopies. The stakeholders were the CRCCP program directors or program managers for award recipients and their backgrounds included nursing, epidemiology, and evaluation. Questions included

- How do participating health systems in the CRCCP program identify patients who need CRC screening?
- How do participating health systems track, or plan to track, results of the stool screening test?
- How do health systems track, or plan to track, follow-up colonoscopies using EMR or other approaches?
- What are the challenges for health systems to track and facilitate follow-up colonoscopy? And what, if any, strategies are being implemented to overcome these challenges?

The calls lasted approximately 30 min. We later conducted site visits during the spring of 2023 to five award recipients and some of their partner health systems, which were a convenience sample, where we further discussed the process the health systems used to track colonoscopies after abnormal stool test results. We maintained detailed notes of

the interviews and site visit conversations that were maintained in Microsoft Word. These notes were reviewed by staff at Implenomics to derive key themes pertaining to barriers and potential solutions. The data gathered through these sources also provided additional contextual knowledge to interpret the results. Institutional Review Board approval was not required because it was determined this study was not research involving human subjects.

Results

Participating health system and patient characteristics

In Table 1, we present patient and provider characteristics from the health systems partnering with the eight CRCCP award recipients. The number of participating health systems per award recipient in this study ranged from 1 to 9, while the number of total clinics included ranged from 4 to 23. The total number of patients, aged 50–75, included in our assessment ranged from 1,978 to 48,558. Across health systems, more than half of the patients were women. The percentage of patients who were uninsured varied across the health systems. Two award recipients had a low proportion of patients who were uninsured (5.0% and 12.8%), while one recipient had a large proportion of patients who were uninsured (38.0%). Similarly, there were differences in population characteristics by race and ethnicity across the eight award recipients: one award recipient had a population that was predominantly Hispanic people (83.2%) and one reported a large proportion of American Indian or Alaska Native people (39.0%). The screening uptake (the percentage of patients screened for CRC) among the award recipients ranged from 38.7 to 48.5%.

Health system ability to track and report screening measures

In Table 2, we report on health systems' ability to track and report data along the CRC screening continuum at baseline. Two of the award recipients reported that the health systems were able to consistently report the number of stool tests mailed or handed out to patients. Four out of the eight award recipients reported that 33.3% to 80.0% of their health systems were able to track stool tests that were provided in clinic or mailed. All award recipients reported that their health systems were able to track all (5 award recipients) or some (3 award recipients) of the stool tests that were returned. Furthermore, only six award recipients reported that their partner health systems were able to consistently document abnormal stool test findings and, although five of these could also report follow-up colonoscopy completion, only two award recipients had health systems who tracked the completion timeframe. Four of the award recipients had health systems partners who were able to report all or some of the findings from the follow-up colonoscopy. All award recipients reported that their health systems were using, or will be using, an EMR system to track stool-based screening, while only five out of the eight reported the use of EMRs for follow-up colonoscopy tracking. All but one health system were using or initiating the use of other tools, such as RED-Cap or Excel, to supplement EMRs to track screening and follow-up colonoscopy.

Table 3 shows screening outcomes from the award recipients who were able to report data for the screening steps. The proportion of stool tests returned ranged from 34.7 to 64.6% (average of 51.7%), while the proportion of abnormal stool tests ranged from 6.9 to 16.8%

(average of 12.4%). The referral rate for follow-up colonoscopy ranged from 70.9 to 89.8% (average of 80.9%). The follow-up colonoscopy completion varied substantially across the award recipients from 24.2 to 75.5% (average of 47.9%); one recipient had a completion rate above 70%, while all others had rates below 58%. Only two award recipients were able to report on the follow-up colonoscopy rate within 6 months after abnormal test findings: the completion rate was 16.3% and 63.3% (average of 39.8%). The percentage of award recipients reporting abnormal findings from follow-up colonoscopy ranged from 56.3 to 84.2% (average of 70.6%). The percentage of adenomatous polyps found in colonoscopy follow-ups ranged from 14.0 to 54.1% (average of 35.0%). There was one case of CRC reported.

Improving tracking and completing of follow-up colonoscopies: summary of barriers and solutions

In Fig. 1, we summarize the feedback from award recipients' health systems on abnormal stool test follow-up barriers and impact on patient outcomes. Ideally the EMR tracking process would proceed as follows: a health clinic would receive stool-based test results and record normal and abnormal tests into the EMR. If a stool test was abnormal, a referral for a colonoscopy would be made and an appointment would be scheduled and documented. The health clinic would then subsequently be notified that a patient completed a follow-up colonoscopy and would receive the patient's results. This information, including when the next colonoscopy should be performed, would also be entered into the EMR. However, award recipients noted a number of barriers that interfere with this process at each step, including not tracking stool test distribution and not knowing if a colonoscopy was for initial screening or follow-up. Along the continuum, award recipients also reported challenges related to lack of staff to enter or abstract data into the EMR, as well as delays and challenges in receiving findings from facilities outside the clinic/health system. In turn, these challenges impact patient outcomes negatively in numerous ways. For instance, recipients noted that health clinics cannot conduct patient reminders if they do not know who received and returned stool-based tests or who had appointments for follow-up colonoscopies. And, if a patient had a follow-up colonoscopy and if the results were abnormal, it was not possible for a health clinic to assist or navigate the patient through treatment without these tracking data.

In Table 4, we present a summary of strategies that CRCCP health systems have begun implementing to improve follow-up colonoscopy completion after the baseline data were collected. Health systems shared multiple strategies to improve data tracking as well as to facilitate follow-up colonoscopies, which we categorized into individual, provider, health system, and community levels of implementation. To improve data tracking of colonoscopy completion, health systems used patient self-reports to enter information into the EMR, as well as trained all staff, including providers, to enter information directly into the EMR. At the health system level, health systems implemented strategies to put into place or enhance the EMR, population health systems, and supplemental platforms, such as REDCap. Patient navigators were also tasked with finding and entering patient test results. At the community level, one award recipient created a website to support making follow-up colonoscopy appointments and providing results.

Health systems have put into practice numerous interventions at the individual level in order to facilitate follow-up colonoscopies. Patients were educated on how to prepare for a follow-up colonoscopy as well as how to interpret test results. Patient navigators, nurses, and other office staff provided instructions or assisted with scheduling appointments for follow-up colonoscopies and, in instances where cost was a concern, provided assistance in finding and enrolling patients in insurance or charitable care. Health center staff also implemented patient reminders and navigation support. At the provider level, health systems added follow-up colonoscopy completion to their provider assessment and feedback reports. Again, where cost was a concern for patients, health systems were able to use either CRCCP funds or charitable funds for follow-up. Health systems also established Memoranda of Understanding with providers who perform endoscopies to provide a certain number of colonoscopies for health system patients at reduced rates or for free. Lastly, at the community level, because colonoscopies require a medical escort to take a patient home, and having an escort and transportation are often barriers, health systems worked to develop partnerships with transportation services, such as Uber Health. Health systems also used existing translated materials from organizations for small media as well as worked to provide interpretation services.

Discussion

In this study, we report on the experiences of selected CRCCP award recipients and health systems in tracking stool-based screening (defined as FIT, FOBT, and FIT-DNA), with specific focus on follow-up colonoscopies after abnormal stool testing. During this baseline assessment, we found that only two of the award recipients reported that all their participating health systems could consistently track the number of stool-based tests distributed. In general, most of the health systems were able to document the stool tests that were returned, although three award recipients reported that some of their health systems were not able to track consistently. Overall, 75% (6 out of 8) of the award recipients reported that the health systems were able to document abnormal findings. These gaps may hinder the ability of health systems to monitor screening to maximize stool test returns and to accurately generate the proportion of abnormal findings, which is required for assessing test performance and informing quality assurance processes [20, 21]. Furthermore, only six of the eight award recipients reported that all participating health systems were able to report referrals and overall completion of follow-up colonoscopies. Importantly, only two award recipients indicated that their partners could report follow-up colonoscopy completion within specified timeframes, such as 6 months from date of abnormal test results. The ability to track timely completion of follow-up colonoscopy is essential, as studies have shown that longer time intervals can result in more advanced disease [10, 22, 23].

These findings highlight the importance of implementing approaches to improve tracking along the screening continuum. Health systems participating in the CRCCP are implementing and testing a range of approaches to improve tracking and follow-up of abnormal stool tests. There is limited evidence on the optimal approach to enhance or supplement EMRs [24], and we found that most health systems are incorporating approaches to track stool-based screenings as well as follow-up colonoscopies using additional data tracking tools, such as REDCap and Excel. Participants at CDC’s 2019 Mailed FIT

summit also spoke to the importance of data infrastructure [9] and developed a mailed FIT implementation guide [25] with information on managing and tracking mailed FITs, which is also instructive for tracking abnormal FITs. Furthermore, the strategies highlighted by participants involve both improvement in data entry and the ability to capture the existing information for decision-making. Health systems are therefore looking beyond technological enhancements. Importantly, training and dedicated staff time were reported as essential to ensure accurate and complete data to track stool-based screening and follow-up colonoscopies.

We found wide variation in the screening process measures among the award recipients in this study whose partner health systems were able to report details on the steps along the screening continuum. On average, 12.3% (6.9 to 16.8%) had abnormal findings and the referral rate was an average of 80.9% (70.9 to 89.8%). Post-analysis conversations with study participants indicated that potential reasons why referrals were not provided may include evidence of a recent colonoscopy in the patients' records and patient health status. The uptake of follow-up colonoscopy ranged from 24.2 to 75.5% with an average of 47.9%. Colonoscopy completion within 6 months of referral was lower with an average of 39.8%. Similarly, low follow-up colonoscopy uptake from 18 to 57% have been reported at FQHCs [12, 13], which are below the 80% target recommended by the Multi-Society Task Force on Colorectal Cancer [26]. Only one health system in our study was able to report a follow-up uptake of 75.5%. However, an evaluation of the CRCCP when the program first began indicated that, when quality measures were in place with systems in place to track and monitor follow-up, 82.9% of people with an abnormal blood stool test completed colonoscopy [11].

Additional research is required to explore the variability reported in this study and to identify optimal strategies to track follow-up colonoscopy completion rates as well as individual, provider, health system, and community-level strategies to support completion of follow-up colonoscopies. As shown above, individual health systems have implemented strategies regarding use of EMR and health population tools; however, there is no one system, as reported by respondents, which tracks individuals along the CRC screening spectrum. Further, the volume of patients served could be an important factor. On the one hand, large health systems may have more resources to implement strategies to improve data tracking and follow-up colonoscopy completion. On the other hand, large health systems may have a greater number of uninsured patients with abnormal stool test findings for whom they need to identify providers who can offer free colonoscopies or identify a payment source for the colonoscopies. And, rural locations and geographic distribution of colonoscopy capacity could also impact follow-up colonoscopy completion rates [27, 28]. Prior studies have indicated that multi-level interventions can likely support individual, provider, health system, and community-level strategies to improve adherence to follow-up colonoscopy [29-35]. In addition, research is required to expand the age range of these analyses to include the age group 45–49.

There are a few limitations that should be considered in interpreting the study findings. First, we included only a limited number of health systems, which were purposively sampled. Therefore, the findings may not be generalizable to community health centers with different

context factors, including patient language preferences, payer mix, and relationships with providers to perform colonoscopies. There may also be selection bias in the health systems chosen by the award recipients. Second, as we did not conduct detailed chart reviews, there could potentially be inaccuracies in the baseline data reported, as health systems were just initiating data quality improvement activities via their participation in CRCCP. Third, there were differences in the annual periods for which the data were reported and, in some instances, the COVID-19 pandemic may have impacted the stool-based screening process and follow-up colonoscopy completion. Fourth, there was substantial variability in the tracking process and outcomes reported; hence, the means reported may be skewed. We have reported the range for each measure to accurately reflect the variation among the participants. Lastly, only a few award recipients reported on FIT-DNA and therefore, we combined all stool test return rates. The return rates may vary as FIT-DNA patients receive patient navigation services from Cologuard, but many health systems also offered various interventions to promote stool test returns. Any patient with abnormal findings though received similar support services at a given health system for completion of follow-up colonoscopies.

Findings from this study offer important lessons for tracking and timely completion of follow-up colonoscopies after abnormal stool tests to complete the screening episode. The health systems in this study that the CDC award recipients partnered with were often unable to track the entire stool-based screening episode accurately and therefore could use support to enhance their EMRs, implement additional tracking tools, and train providers. Furthermore, these health systems could be aided by guidance on evidence-based strategies that can be implemented to improve tracking and increase completion of follow-up colonoscopies after abnormal stool tests. More active engagement by health centers providing follow-up colonoscopies in communicating appointments and test results could support patients' adherence to receiving follow-up colonoscopies. Improvements in data tracking and screening completion may also help to improve health equity and reduce mortality from CRC.

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Data availability

The datasets generated during and/or analyzed during the current study are not publicly available because they were collected by Implenomics for the purpose of this analysis and under contract with the Centers for Disease Control and Prevention.

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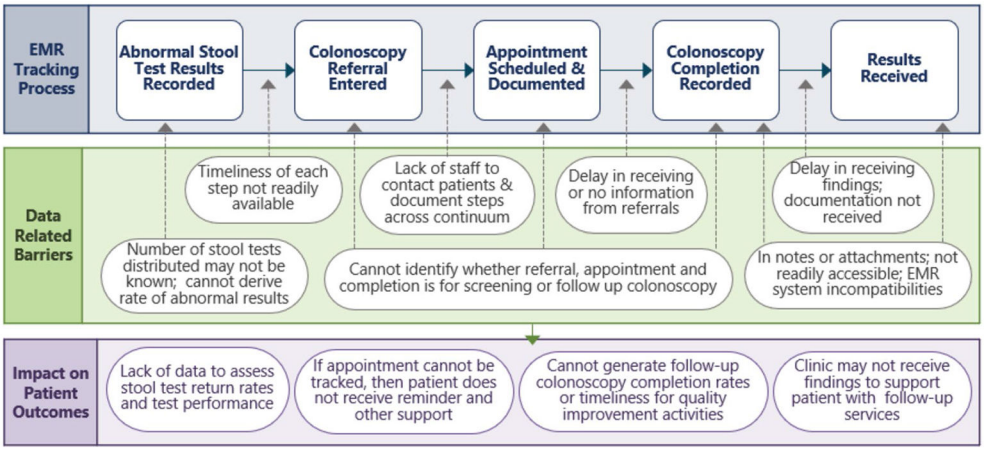

Fig. 1.
Challenges in tracking data on follow-up colonoscopy completion

Table 1

Patient and provider characteristics and screening rates among eight CDC Colorectal Cancer Control Program Award Recipients, 2020–2022

	CDC Colorectal Cancer Control Program Award Recipient							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
12-month timeframe	2020	2021	2021	2019	2022	2021	2019	2020
Health systems (n)	1	1	2	9	3	1	4	5
Clinics (n)	19	22	8	23	4	4	10	8
Primary care PROVIDERS (n)	201	41	27[a]	141	101	27	102	30
Number of screening-eligible patients, and proportion of women and uninsured patients aged 50–75								
Patients (n)	48,558	6,537	6,001	17,649	19,359	1,978	6,471	5,887
Women (%)	55.0	50.0	58.0	52.9	54.3	58.7	58.7	55.8
Uninsured (%)	20.0	38.0	22.8[a]	18.1	12.8	25.9	21.5	5.0
Race/ethnicity of patients aged 50–75 (%)[b]								
Hispanic	83.2	2.0	3.0	16.6	22.6	3.1	8.2	0.0
White	17.2	55.0	87.6	69.7	38.2	71.8	79.9	96.8
African American	3.7	0.0	7.8	8.1	35.1	15.3	0.6	2.1
Asian	7.5	2.0	0.1	2.1	12.0	0.0	5.0	0.0
Native Hawaiian or other Pacific Islander	0.0	0.0	0.2	0.2	0.6	0.0	0.3	0.0
American Indian or Alaskan Native	0.0	39.0	0.6	0.3	0.1	0.0	8.3	0.0
More than one race	0.0	0.0	0.2	1.1	6.9	0.0	0.4	0.7
Refused to report or missing	0.0	0.0	1.1	1.7	0.0	10.0	0.0	0.0
CRC screening uptake								
Number screened	23,523	2,375	2,774	8,562	6,945	821	3,059	2,790
Screening uptake (%)[c]	48.0	42.0	46.2	48.5	38.7	42.0	47.3	47.0

[a] Only 1 health system reported these details

[b] Race /ethnicity of patients may not sum to 100% because of double counting of multiple race/ethnicity. Data for Recipient 4 excludes 1 health system when reporting percentage of women and 2 health systems when reporting race/ethnicity.

[c] The proportion of patients screened compared to the number of patients eligible for screening. Screening uptake includes all methods of screening

Table 2

Clinic/health system ability to report data along the CRC Screening Continuum at baseline

	CDC Colorectal Cancer Control Program Award Recipient							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
12-month timeframe	2020	2021	2021	2021	2022	2021	2021	2021–2022
Health systems (n)	1	1	2	9	3	1	4	5
Clinics (n)	19	22	8	23	4	4	10	8
Do clinics within health systems track stool test distribution and return?								
Provided in clinic/mailed stool tests	None	None	None	Some (51.4%)	Some (33.3%)	All	All	Some (80.0%)
Returned stool tests	All	All	Some[a]	Some(62.5%)	Some (33.3%)	All	All	All
Abnormal stool test findings	All	All	All	None	None	All	All	All
Do clinics within health systems track referral and completion of follow-up colonoscopy after abnormal stool test?								
Referred for a follow-up colonoscopy	All	All	All	None	None	None	All	All
Completed follow-up colonoscopy	All	All	All	None	None	All[b]	All	All
Completed follow-up colonoscopy within 6 months of abnormal findings	All	All	None	None	None	None	None	None
Do clinics within health systems track results from follow-up colonoscopy?								
Any abnormal findings	None	All	All	None	None	None	Some	All
Adenomatous polyps	None	All	None	None	None	None	All	All
CRC diagnosis	None	All	None	None	None	None	Some	All
Do clinics within health systems track, or plan to track, the results of the stool-based screening test?								
Track within EMR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Track using other approaches[c]	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Do clinics within health systems track, or plan to track, follow-up colonoscopies?								
Track within EMR	Yes	No	Yes	Yes	Yes	No	No	Yes
Track using other approaches[c]	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes

We defined stool tests as FOBT, FIT, and FIT-DNA tests. [a]Not able to consistently track all returns; [b]The recipient did not report number referred so it is not possible to verify all colonoscopies are for follow-up after abnormal stool tests; [c]Most common approaches were to use RED-Cap or Excel and at baseline data collection these approaches may not have been fully functional

Table 3

Screening outcomes among health systems able to report the required data

	CDC Colorectal Cancer Control Program Award Recipient								Mean
	1	2	3	4	5	6	7	8	
12-month timeframe	2020	2021	2021	2021	2022	2021	2021	2021–2022	
Steps along the Screening Continuum									
Stool tests returned, n (%)	–	–	–	2,572 (57.4)	263 (45.0)	236 (57.0)	820 (64.6)	522 (34.7)	51.7 [34.7–64.6]
Abnormal stool test results, n (%)	1,032 (6.9)	57 (16.8)	141 (−)	–	–	24 (11.4)	104 (12.7)	74 (14.2)	12.4 [11.4–16.8]
Referral for follow-up colonoscopy, n (%)	927 (89.8)	49 (86.0)	100 (70.9)	–	–	–	87 (83.7)	55 (74.3)	80.9 [74.3–89.8]
Follow-up colonoscopy completed–based on available records, n (%)[a]	224 (24.2)	37 (75.5)	48 (48.0)	–	–	–	50 (57.5)	19 (34.5)	47.9 [24.2–75.5]
Follow-up colonoscopy completion rate—within 6 months, n (%)[a]	151 (16.3)	31 (63.3)	–	–	–	–	–	–	39.8 [16.3–69.3]
Screening Outcomes									
Any abnormal findings, n (%)[b]	–	28 (75.7)	27 (56.3)	–	–	–	33 (66.0)	16 (84.2)	70.6 [56.3–84.2]
Adenomatous polyps, n (%)[b]	–	20 (54.1)	–	–	–	–	n/r (14.0)	n/r (36.8)	35.0 [14.0–54.1]
CRC diagnosis, n(%)[b]	–	0 (0.0)	–	–	–	–	n/r (2.0)	0 (0.0)	0.7 [0.0–2.0]

We defined stool tests as FOBT, FIT and FIT-DNA tests

A '-' indicates that the information was not available

[a]Among those referred for follow-up colonoscopy

[b]Among those who completed follow-up colonoscopy n/r = cannot report due to small sample size

Table 4

Summary of strategies initiated by CDC Colorectal Cancer Control Program award recipients to improve data tracking and follow-up colonoscopy completion

Level of implementation	Data improvement to TRACK completion	Facilitating follow-up colonoscopy
Individual	Request information on colonoscopy completion from patients and enter into the EMR system	Educate patients on test results and train them on bowel preparation Offer patients support to schedule appointments Provide assistance to enroll patients in insurance or other programs Send patient reminders and offer navigation support to address barriers
Provider	Train all team members to enter accurate data in the appropriate fields in the EMR system	Implement a Provider Assessment and Feedback system
Health System	Enhance EMR for tracking CRC screening Implement overlay systems for population health analyses Build dashboard to easily review data for tracking Collect data in tools outside of the EMR Track data with the assistance of patient navigators	Initiate new payment processes to reimburse follow-up colonoscopy using CRCCP or donated funds Establish agreements with providers who perform endoscopies (i.e., securing additional appointments; donated colonoscopies for uninsured or underserved patients)
Community	Create website to support appointments and return of colonoscopy results	Develop partnerships with transport providers for rides and chaperone services Expand interpretation support to cover all languages spoken by patients