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## Improving Colorectal Cancer Screening and Testing in a Primary Care Clinic

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IMPROVING COLORECTAL CANCER SCREENING AND TESTING  
IN A PRIMARY CARE CLINIC

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Leslie Michelle DuBois

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## LIST OF ABBREVIATIONS

Abbreviation	Page
1. colorectal cancer (CRC).....	12
2. U.S. Preventive Services Task Force (USPSTF).....	13
3. fecal immunochemical test (FIT).....	13
4. deoxyribonucleic acid (DNA).....	13
5. computerized tomography colonography (CTC).....	13
6. United States Multi-Society Task Force (MSTF).....	14
7. federally qualified health center (FQHC).....	14
8. Health Resources & Services Administration (HRSA). ....	14
9. Uniform Data System (UDS).....	15
10. Children’s Health Insurance Program (CHIP).....	17
11. obstetrics/gynecology (OB/GYN).....	19
12. full time equivalent (FTE).....	20
13. medical assistant (MA) .....	20
14. electronic health record (EHR) .....	21
15. vital signs (VS) .....	22
16. physical exam (PE).....	22
17. provider approval queue (PAQ).....	23
18. gastroenterology (GI).....	24
19. fecal occult blood tests (FOBTs).....	38

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20. short message service (SMS).....	39
21. plan-do-study-act (PDSA).....	41
22. digital video disc (DVD).....	52
23. coronavirus disease 2019 (COVID-19).....	66
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37. flexible sigmoidoscopy (FS).....	93

### **Abstract**

Colorectal cancer (CRC) is the third most common cancer and the second most common cause of cancer-related deaths worldwide (World Health Organization, 2019a). In the United States, CRC was the fourth most common cancer in 2016 (Centers for Disease Control and Prevention, 2019a). The American Cancer Society (2020a) estimated that there will be 147,950 new cases and 53,200 deaths of CRC in the U.S. in 2020. The purpose of the project was to improve CRC screening completion rates and follow up referrals from 27.5% to 35% for adult patients, 50-75 years of age, within a family medicine clinic using the U.S. Preventive Services Task Force (2016) and Health Resources & Services Administration (2018b) clinical practice guidelines utilizing fecal immunochemical tests (FIT) kits. FIT is a huge benefit to the underinsured, uninsured, and underserved populations in detecting CRC (Riehman et al., 2018). The objectives were to increase the percentage of patients meeting screening guidelines who receive an order for CRC screening through staff and patient education made readily available; increase the percentage of FIT results through FIT kit distribution within the clinic and live communication follow up for those with no results in the EHR; and increase the percentage of those with a positive FIT who receive a referral for follow up testing within 2 weeks through standardized EHR communication process and use of clinic tracking sheets. HRSA provides funding to the organization for preventive services based on performance on CRC screening. CRC is 100% treatable and the impact of improving CRC screening will improve patient outcomes by preventing and decreasing disability and mortality from CRC.

*Keywords:* colorectal cancer, colorectal cancer screening, colorectal cancer testing, FIT

### **Improving Colorectal Cancer Screening and Testing in a Primary Care Clinic**

Colorectal cancer (CRC) is the third most common cancer accounting for 1,849,518 cases and the second most common cause of cancer related deaths worldwide resulting in 880,792 deaths in 2018 (World Health Organization, 2019a). The Centers for Disease Control and Prevention (2019a) noted that CRC is the third leading cause of mortality from cancer in both sexes worldwide. In the United States, CRC was the fourth most common cancer with 141,270 new cases and 52,286 deaths in 2016 (Centers for Disease Control and Prevention, 2019b). The American Cancer Society (2020a) estimated that there would be 147,950 estimated new cases and 53,200 estimated deaths of CRC in the United States in 2020.

CRC is preventable in the average risk adult, 50-75 years of age, with appropriate screening in the primary care arena. Even though CRC is the most preventable type of cancer, it is the least prevented cancer due to the lack of formal screenings and lack of information (Colace et al., 2017). CRC occurs when polyps become cancerous which usually takes more than 10 years (Rex et al., 2017). This is one of the factors that contributes to making CRC so preventable. The World Health Organization (2019b) has identified several CRC risk factors that can be addressed through primary prevention such as alcohol use, physical activity, dietary habits, and obesity. CRC screening is considered secondary prevention; however, it has proven to decrease the morbidity and mortality attributed to CRC in average risk adults, 50-75 years of age due to early detection of the CRC (Rex et al, 2017).

In Texas, CRC was the fourth most common cancer with 10,007 new cases and 3,847 deaths in 2016 (Centers for Disease Control and Prevention, 2019b). Hispanics have the second highest rate of new CRC cases in Texas in 2016 (Centers for Disease Control and Prevention, 2019b). Texas 2016 statistics mirror those at the national level (Centers for Disease Control and

Prevention, 2019b). The American Cancer Society (2020b) estimates that there will be an estimated 11,430 new cases and 4,070 estimated deaths related to CRC in Texas.

In Bexar County, Texas there were 3,323 new cases of CRC and 1,290 deaths from CRC between 2013-2017 (Centers for Disease Control and Prevention, 2019b). In Texas Congressional District 35, there were 1,269 new cases and 465 deaths from CRC from 2013-2017 (Centers for Disease Control and Prevention, 2019b). CRC was the third most common cancer within the Hispanic population (38.2 per 100,000 people) from 2013-2017 in Texas Congressional District 35 (Centers for Disease Control and Prevention, 2019b). The Centers for Disease Control and Prevention (2017) indicated that in 2016, Texas had a CRC screening rate of 60.1% and that uninsured male Hispanics between 50 to 64 years of age were not screened for CRC. The Texas Department of State Health Services (2018) estimated that 73.3% of Bexar County residents, ages 50-75 years of age, indicated that they were up to date on colorectal cancer screening.

### **Current Guidelines**

The U.S. Preventive Services Task Force (USPSTF) (2016) suggests screening for CRC beginning at age 50 years and proceeding until 75 years of age. The American Cancer Society (2018a) identifies that there are two groups of screening tools for CRC, stool-based tests and visual examinations. Stool-based tests include an annual fecal immunochemical test (FIT) or a stool deoxyribonucleic acid (DNA) test every 3 years. Visual examinations include a sigmoidoscopy/computerized tomography colonography (CTC) every 5 years or a colonoscopy every 10 years. A colonoscopy is required if any of the above tests are abnormal (American Cancer Society, 2018a). The American Cancer Society (2018b) notes that the most important action when considering the risks and benefits of each test is to simply get screened. The FIT

offers the most inexpensive option with the least amount of risks as well as it is often offered free for those who are uninsured or underinsured. Riehman et al. (2018) noted that the FIT could be of a huge benefit to the underinsured, uninsured, and underserved populations due to its cost-effectiveness and accuracy in detecting CRC.

The U.S. Multi-Society Task Force (MSTF) on CRC that consisted of the American College of Gastroenterology, the American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy released a consensus guideline recommending that primary care providers advise patients to have a colonoscopy or a FIT if the colonoscopy is declined as tier-one tests for adults 50-75 years of age whom are at average risk for CRC (Rex et al., 2017). These screening tests are grouped into tiers based on performance, affordability, and simplicity (Rex et al., 2017). The MSTF on CRC recommended that the key quality metrics to measure in a FIT program include: (a) FIT completion rate of those offered the FIT, (b) the number returning the specimen, (c) the number returning the specimen but sample is unacceptable (beyond the return time as determined by manufacturer guidelines) and (d) colonoscopy follow up rate for those with a positive FIT (Robertson et al., 2017).

### **Statement of the Problem**

A microsystem assessment of a federally qualified health center (FQHC) family medicine east campus clinic that is a part of a larger healthcare system revealed a CRC screening completion rate of 27.5%. The organizational goal for CRC screening was 31% in order to maximize reimbursement from the Health Resources & Services Administration (HRSA). This FQHC family medicine clinic serves a large Hispanic population that is eligible for CRC screenings according to the MSTF guidelines.

The family medicine east campus clinic providers have been identified as needing improvement by the organization as neither was meeting the organizational goal of 31% for completed CRC screenings. There are a total of 35 providers in the organization who provide healthcare to patients who qualify for CRC screenings. The two providers for the family medicine east campus clinic were ranked No. 23 (25.5%) and No. 25 (25%) as of August 31, 2019 for CRC screening completion rates.

The healthcare organization's previous performance on CRC screening as reported by the HRSA Uniform Data System (UDS) for 2016, 2017, and 2018 was 17.59%, 12.90%, and 33.64% respectively (HRSA, 2018a). The desired organization goal for 2019 was 35%; however, the minimally acceptable threshold for meeting the goal was 31%. The organization's performance on CRC screenings for August 2019 was 31% based on the quality performance dashboard application, which provides real-time performance on quality of care measures and any other measures that the organization considers being of importance. The healthcare organization has consistently had the lowest performance on CRC quality of care measure in 2016-2018 compared to other preventive services according to the UDS reports. As of August 31, 2019, the top three best performing clinics for CRC screening were the west campus (52.2%), the northwest campus (49.3%), and the medical center campus (47.3%). As of August 31, 2019, the clinics that were identified as needing improvement included the San Marcos campus (28.6%), the east campus (26.2%), and the Kyle campus (16.8%). As of August 31, 2019, the top three healthcare organization provider's individual performance scores for CRC screenings were 72.9%, 68%, and 65.5%. As of August 31, 2019, the lowest three healthcare organization provider's individual performance scores for CRC screenings were 25.5%, 25%, and 17.3%.



Two of these three low provider performances are associated with two providers who staff the east clinic where I did this quality improvement project.

### **Background and Significance**

CRC screening in the United States is a significant problem with approximately 38 million people (1 in 3 adults), 50-75 years of age not getting screened for CRC as recommended (National Colorectal Cancer Roundtable, 2019). The National Colorectal Cancer Roundtable (2020) has set the target rate for CRC screening in every community at 80%. The Centers for Disease Control and Prevention (2019c) concluded from the 2018 Behavioral Risk Factor Surveillance System that 81% of adults, 50 to 64 years of age have never been screened for CRC. Healthy People 2020 (2019) set a target goal of 70.5% for CRC screenings based on the most recent clinical guidelines, which encompasses adults 50 to 75 years of age. Despite the wide availability of screening tests, there has only been a 7% increase in CRC screenings from 2013 to 2018 (Health People 2019, 2020). CRC screening disparities are most apparent among those with a low household income, low educational completion rate, and those of Hispanic/Latino origin (DeGroff et al., 2018; Joseph et al., 2020).

The percentage of adults, 50 to 75 years of age, who were in compliance with colorectal malignancy screening was 68.8% in 2018 (Centers for Disease Control and Prevention, 2019c). The National Committee for Quality Assurance (2019) Healthcare Effectiveness Data and Information Set for 2018 indicated that the CRC screening rate was 64.1% and 60.3% for the commercial health maintenance organization and preferred provider organization coverage respectively. The Healthcare Effectiveness Data and Information Set for 2018 indicated a CRC screening rate of 71.1% and 75.2% for health maintenance organization and preferred provider organization Medicare coverage respectively (National Committee for Quality Assurance, 2019).

Additionally, Indian Health Service's (2019) Government Performance and Results Act for 2017-2019 revealed CRC screening rates of 41.4% (target: 40.2%) and 31.9% (target: 32.6%) for 2017 and 2018 respectively. A target rate of 32.6% was established for 2019 but no outcome data was provided as of to date (Indian Health Service, 2019). The combined UDS CRC screening rates for FQHC adults ages 50-75 years for 2016-2018 was 39.9%, 42.0%, and 44.1% respectively (National Colorectal Cancer Roundtable, 2019).

### **Background and Significance Summary**

CRC screening rates have been increasing over the past couple of years; however, the screening rates among the nation's minorities and vulnerable populations who are uninsured or underinsured remains widely unchanged. Even though there is a national goal to have every community reach an 80% screening rate for CRC, many FQHCs across the nation struggle to reach a screening rate that is half the national goal. The family medicine east campus clinic struggles with meeting not only the national goal but also with meeting the CRC screening rate threshold for this organization of 31%.

### **Assessment**

The family medicine east campus clinic serves mostly patients who are Hispanic or African American. The zip code for the east campus location is 78220. The primary zip code that the clinic provides services to is 78220, drawing 1,667 patients from this area. The next two highest zip codes that the clinic provides service to is 78210 and 78702, drawing 1,393 patients and 1,165 patients respectively from these areas. Within the zip code area of 78220, there are 880 individuals who are covered by Medicaid, Children's Health Insurance Program (CHIP), or other public programs. Of the remaining patients, 490 individuals are uninsured, 217 individuals have private insurance, and 80 individuals are covered by Medicare. According to Advameg

(2019), the zip code area 78220 had a population size of 17,080 in 2017. The 2017 median household income for 78220 was \$29,966 compared to the State average of \$59,206 and national average of \$61,372 (Advameg, 2019; Fontenot et al., 2018). The unemployment rate in 2017 for 78220 was 8.6% compared to the State and national average of 4.3% (Advameg, 2019; Dunn & Blank, 2018; U.S. Bureau of Labor Statistics, 2020). According to UnitedStatesZipCodes.org (2019), the educational completion level for those 25 years of age and older in 2015 for the 78220 zip code was 29.6% having less than a high school diploma, 52.1% having a high school diploma, 6.6% having an associate's degree and 11.8% having a bachelor's degree or higher. The vast majority of patients in the primary zip code that are seen by the family medicine east campus clinic are patients who are Hispanic or African American with a median household income of \$29,966 who have a high school diploma or less with an unemployment rate of 8.6%, which is below the national average in all categories. Furthermore, the majority of these patients are on Medicaid, CHIP, or other public program to cover healthcare costs. Data supports that this clinic primarily sees a vulnerable population. When comparing this to the demographics of the entire healthcare organization, a similar picture emerges.

The total number of patients seen by the entire healthcare organization is 27,866. Of these patients, 10,345 are 100% and below poverty guidelines; 4,983 are 101-150% below poverty guidelines; 2,481 are 151-200% below poverty guidelines; 416 are over 200% below poverty guidelines; and 43,027 are unknown as these patients have opted to pay full fee because they refused to provide income information for billing purposes. Access to insurance information for adults, 18 years of age or older, within the healthcare organization reveals that 53.8% of patients seen are uninsured, 6.1% have Medicare, and 28.9% have private insurance.

The family medicine clinic population for the entire healthcare organization consists of adults 18 years of age or older. The total number of patients seen in 2018 who were 18 years of age or older was 17,776 with 12,119 (68.2%) being female and 5,627 (31.8%) being male. The total number of patients 50-74 years of age that were seen was 6,324 (35.6%) with 3,997 (63.2%) being female and 2,327 (36.8%) being male. The top three medical conditions within the healthcare organization for patients who frequently visited the family medicine clinics were overweight and obesity (19,165 patients), hypertension (6,654 patients), and diabetes mellitus (4,389 patients). The top three referrals for the family medicine clinics were made to dermatology, behavioral health, and cardiology. The family medicine east campus clinic had similar findings as the entire healthcare organization with the exception of a significant number of referrals also being made to obstetrics/gynecology (OB/GYN) in addition to the top three listed for the entire healthcare organization.

For the most part patients were satisfied with the services provided by the east campus clinics. The three east campus clinics that received the highest satisfaction scores were dental (93.8%), OB/GYN (93.3%), and pediatrics (88.2%). The reasons provided for these high scores was phone attendant courtesy and helpfulness (navigation center handles all incoming calls), providers listening and providers explaining information at a level understood by the patients. The family medicine clinic had the lowest satisfactions scores (84.7%) of the east campus clinics. The reasons provided for these low scores were provider wait times, quality/value of care received and ability to be a walk-in patient.

The low satisfaction score may be explained somewhat by the volume of patients the family medicine clinic sees on a routine basis which can impact wait times, quality of care and the ability to see a provider without a scheduled appointment. For example, there were a total of

676 visits in the family medicine east campus clinic in August of 2019. This translates into approximately 15-30 daily visits per provider for August 2019. Broken down by a weekly volume, there were 165 family medicine east campus clinic visits during the week of August 12-16, 2019. While the majority of these patients are established patients within the clinic, a significant number of new patients were seen which require longer appointment times that are not calculated into the scheduling. Of the 676 visits during August 2019, 89 (13.1%) of these patients were new patients. There was no data available for the number of patients leaving the family medicine east campus clinic during August 2019. In order to get a better picture of the provider workload for the family medicine east campus clinic, data was pulled for the number of patients seen by the current providers for 2018. The current nurse practitioner saw approximately 4,359 patients in 2018. There was no current physician data available as the physician provider was recently employed in April of 2019. However, data from 2018 for the healthcare organization revealed that on average, the nurse practitioners within the healthcare organization see 3,762 patients while the physicians see 4,004 patients.

The family medicine east campus clinic is staffed by one family medicine physician (0.80 full time equivalent (FTE)), one family nurse practitioner (1.0 FTE), two medical assistants (MAs) (2.0 FTE's), and one float MA (1.0 FTE). The family medicine east campus clinic is open Monday thru Friday from 0800-1900 excluding major holidays. There is a website available on the world wide web where the patient portal access is located for patients to access their medical records, laboratory results, and send/receive secure messages from the healthcare team. All appointments are booked in 10-minute intervals and often time providers are double-booked or sometimes even triple-booked. Appointment types are classified as either established patients, follow up patients, acute patients, new patients, emergency room follow up patients, walk in

patients, injections, adult physicals, or same day service. The appointment type is not always indicated on the schedule. As previously mentioned, scheduling adjustments are made based on appointment classification.

The healthcare organization is designated as a FQHC. HRSA provides funding to the healthcare organization for primary care services rendered in an underserved location based on performance of certain quality of care measures. CRC screening is one of these quality of care measures. Quality is measured based on the total number of patients seen between the ages of 50-75 (denominator) and the number of patients who received appropriate screening for CRC (numerator) (HRSA, 2018b). This information is transmitted electronically via the UDS based on calendar year performance. There are eight quality of care measures that includes or spans patients 18 years of age or older and can include other service lines such as OB/GYN or pediatrics. The organization offers free FIT testing to all patients regardless of insurance coverage.

The healthcare organization has received substantial funding as a FQHC that meets the quality of care measures as established by the federal government. In fact, the healthcare organization received \$75,000 in 2018 for improving HRSA quality of care measures. Over the last 2 years, the organization has received \$6,949,883 in grant funding. The cash income for 2018 was \$4,423,231.

### **Current CRC Screening Process**

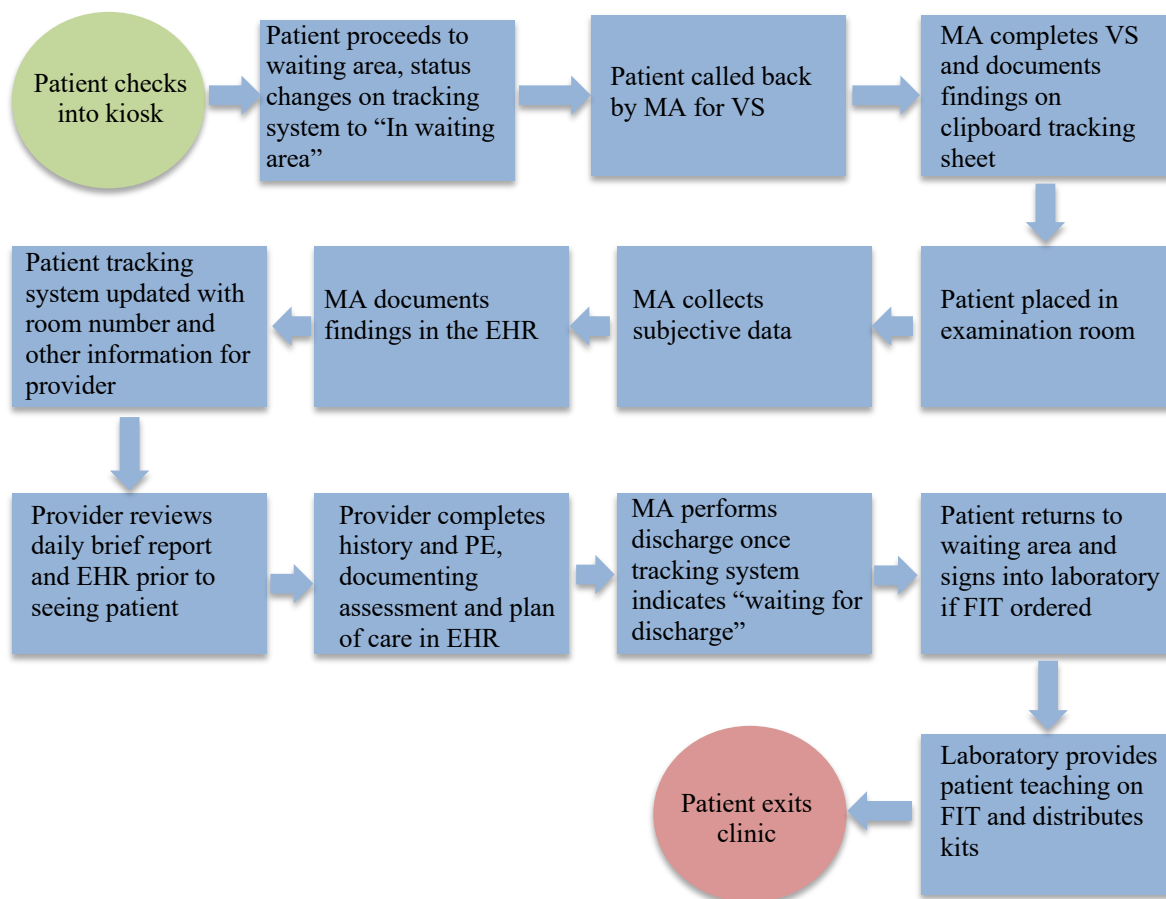
The current CRC screening process starts when the patient enters the clinic and checks into the kiosk that causes a change in the patient tracking column to reflect “in waiting area” in green font in the electronic health record (EHR). The patient proceeds to the family medicine east campus clinic’s waiting area. The MA notes the change in status in the inbox queue and

meets the patient in the waiting area to escort him or her to the vital signs (VS) area where vital signs are taken. The MA records the vital signs onto a tracking sheet attached to a clipboard and moves the patient to the examination room. While in the examination room, the MA collects subjective data that includes the chief complaint, history of present illness, medication reconciliation, completion of a depression screening, and conducts a review of systems. The MA updates the EHR in the examination room as information is collected or upon returning to the computer station. The patient tracking column is updated with the examination room number and other information that the MA deems important to communicate. The MA may communicate to the provider verbally if there are any checklist items (preventive screenings) on the printed daily brief report that needs to be addressed. Colorectal is identified on the printed daily brief report if the patient is due for a CRC screening. The provider reviews the daily brief report and EHR to identify if any preventive screenings are due prior to entering the examination room. Once in the examination room, the provider conducts an interview, performs a physical examination (PE), completes the assessment in the EHR, and enters a plan that includes the patient's diagnosis, laboratory orders, referrals, medications, discharge instructions and follow up instructions. Once this is complete, the patient tracking column is updated by the provider indicating waiting for discharge. The MA prints the patient's plan/discharge instructions that may include a laboratory order for a FIT or a referral for a colonoscopy and proceeds to perform discharge teaching with the patient. If there is an order for a FIT, the MA instructs the patient to return to the waiting room upon discharge to sign in on the laboratory clipboard in order to be placed in the queue for a FIT kit distribution. If there is a referral for a colonoscopy, the MA instructs the patient on the referral process and the timeframe to expect a response in relation to the referral. The laboratory staff checks the clipboard regularly and calls the patient back to the specimen collection area

where instructions on how to collect the specimen for the FIT is provided. If the patient does not have any questions, then the laboratory staff dispenses the FIT to the patient. Once the laboratory staff completes this process, then the patient exits the clinic. Figure 1 provides an overview of this process.

**Figure 1**

*Flowchart of Current CRC Screening Process*



### Current FIT Positive Result Process

The current process for positive FIT results starts when the provider receives a notification of the positive FIT result in the provider approval queue (PAQ). Provider A creates a clinical task within the EHR that delegates the MA to call and inform the patient about the



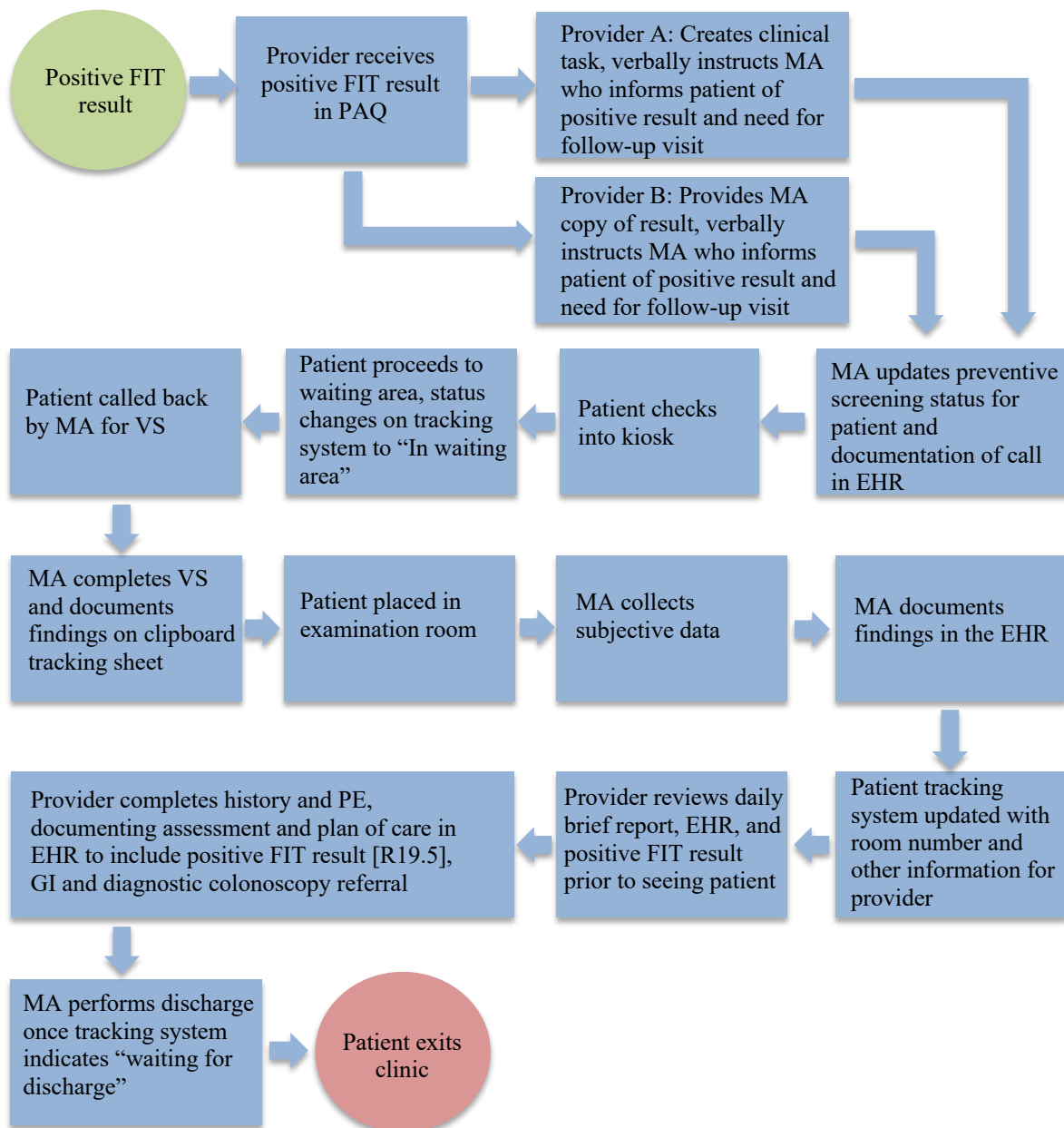
abnormal test result and schedule a follow up appointment. The MA marks the task as complete in the EHR. The provider also notifies the MA verbally about the clinical task. Provider B prints and provides a copy of the positive FIT test result to the MA and verbally instructs the MA to call and inform the patient about the abnormal test result and to schedule a follow up appointment. Upon completion, the MA initials the printed copy of the positive FIT test result and places the initialed copy in the provider's folder in the locked records room. The MA updates the preventive screening status in the EHR noting the FIT date and result, the date the patient was called, the request for the patient to schedule a follow up appointment and enters the reason for the telephone communication (abnormal test result and date of follow up appointment). When the patient returns to the clinic for the follow-up visit related to the positive FIT, the check in procedure is basically the same as a regular clinic visit as previously described except after updating the patient tracking column in the EHR that the patient is in an examination room, the MA verbally communicates to the provider that the patient is following up for a positive FIT result. The provider reviews the EHR and laboratory module to confirm the positive FIT result before proceeding to the examination room. Once the provider has completed the history and physical examination, the provider discusses with the patient the need for a gastroenterology (GI) referral and colonoscopy. If the patient agrees with this recommendation, a referral is included in the plan of care. If the patient refuses the recommendation for a referral, that decision is entered in the EHR. Upon completion of the patient interaction, the patient tracking column is updated by the provider with waiting for discharge. The MA prints the patient's plan/discharge instructions which includes the GI and diagnostic colonoscopy referrals if the patient agreed with the recommended plan of care. The MA provides instructions about the

referral process and timeframe involved for the referral before completing the discharge process.

The patient then exits the clinic. Figure 2 provides an overview of this process.

**Figure 2**

*Flowchart of Current FIT Positive Results Process*



**Organizational Readiness for Change**

From the executive leadership down to the provider, there was a consensus that screening rates for CRC screening must improve. The providers and staff at the family medicine east campus clinic are motivated, committed, capable and ready to implement the changes necessary to increase the clinic's performance with CRC screening. The laboratory staff are supportive of any interventions that are required of them to aid in improving CRC screening completion rates. The healthcare organization has hired a population health manager who has experience with improving preventive care services improvement and this person is willing to assist with the project. The quality manager was onboard and ready to support this quality improvement project in order to increase CRC screening rates. One person in administration felt that he was trying to look out for the MAs workload. However, after I engaged in discussion with the MAs, they felt that participating in the project would not increase the current workload requirements. I was able to convince the person in administration to be supportive of the project after showing the initial results of the project 2 weeks into implementation. A letter of support was obtained from my clinical mentor and the practice manager for the family medicine east campus clinic (Appendix A).

**Stakeholders and Stakeholders Engagement**

The stakeholders for this quality improvement project are the patients, the patient's families, the clinic staff, the clinic providers, my clinic mentor, the population health manager, the quality improvement manager, clinic management, the organization leadership, and myself. This project can have an impact on improving patient outcomes by preventing and decreasing disability and mortality related to CRC. Man et al. (2018) noted that many CRC related deaths may be due to missed CRC screening opportunities. CRC is a preventable and treatable cancer if

detected early. This means that detection of CRC initially starts with the appropriate screening of adults 50-75 years of age. The providers and staff have provided input for ways to increase CRC screening that includes: (a) patient notification via text messaging and patient portal messaging, (b) provider reminders in the EHR, (c) clinic navigator whose designated position is to track and contact patients about preventive screenings and abnormal results, (d) community outreach activities such as flyers, (e) provider and staff education on screening options, (f) pamphlets in the waiting room that addresses CRC screening, (g) use of public service announcements via the television in the waiting room, (h) distribution of literature during the office visit, (i) increased use of patient education portals in the exam rooms, (j) consistent use of standing orders by MAs to order the CRC screening test, (k) increased communications with the laboratory that distributes and receives completed FITs, and (l) access to FIT kits after normal laboratory hours for distribution to patients. Upon reviewing all the input from the providers, clinic management, and staff and taking into account the evidence-based literature, a plan was devised that chose the most efficient, effective and cost saving interventions that could help meet the goal of improving CRC preventive screenings in patients 50-75 years of age that were seen by the family medicine east campus clinic. Details of this plan can be found in the methods section.

### **Assessment Summary**

The family medicine east campus clinic serves a vulnerable segment of our population in San Antonio, Texas. As a FQHC provider of primary care, the family medicine east campus clinic is interested in improving its performance related to the CRC screening quality of care measure. Addressing the low performance of CRC screenings within the clinic will improve patient outcomes by preventing and decreasing disability and mortality related to CRC. CRC is a

preventable and treatable cancer if detected early. The means for detection starts initially with the appropriate screening in adults 50-75 years of age.

### **Project Identification**

#### **Purpose**

The purpose of this performance improvement project was to improve the number of adult patients in a FQHC family medicine clinic, ages 50-75 years, who complete CRC screening from 28.2% to 35% by April 2020 following the USPSTF (2016) and HRSA (2018b) clinical practice guidelines for CRC screening utilizing FIT kits as well as standardizing the process for proper disposition and referral for a diagnostic colonoscopy for patients with a positive FIT result.

#### **Objectives**

The objectives for this evidenced based project were to:

- increase the percentage of patients meeting screening guidelines who receive an order for CRC screening in the EHR on the day of their patient visit from 46% to 100%
- increase the percentage of patients who have FIT results entered into the EHR from 26% to 75%
- increase the percentage of patients with positive FIT results documented in the EHR who receive a referral for follow up testing within 2 weeks from 20% to 100%

#### **Anticipated Outcomes**

It was anticipated that implementation of this project would result in more adult patients between the ages of 50-75 years obtaining an order for CRC screening and receiving their FIT kit prior to leaving the family medicine east campus clinic. By increasing the percentage of patients who received an order and a FIT kit during their office visit, a greater number of these patients

would submit a stool specimen for analysis thereby increasing CRC patient screening results in the EHR. Those patients with a positive FIT result would then be referred for follow-up within 2 weeks of having their results entered into the EHR. Increasing CRC screening rates helps to improve identification of CRC with an opportunity to obtain definitive treatment in a timelier manner.

### Summary and Strength of Evidence

The Melnyk and Fineout-Overholt (2015) system for level of evidence was used to rate the literary evidence strength. This system consists of seven levels and is based on a combination of quality, validity, and applicability of the evidence to a specific patient environment (Melnik & Fineout-Overholt, 2015). Table 1 provides a summary overview of the rating system.

**Table 1**

#### *Level of Evidence*

Level of Evidence	Study Design
I	Systematic reviews and meta-analysis of randomized controlled studies
II	Single, randomized controlled studies
III	Quasi-experimental studies and non-randomized controlled studies
IV	Cohort or case-control studies
V	Systematic review or meta-synthesis of qualitative or descriptive studies
VI	Single, qualitative or descriptive studies
VII	Expert opinion of authorities and/or reports of expert committees

The Johns Hopkins Nursing Evidence-Based Practice system for quality of evidence was used to rate the literary evidence quality (Dang & Dearholt, 2018). This system consists of four

levels and uses a lettering system of A, A-B, B, and C to depict quality of evidence. The quality of evidence is based on a combination of study design, sample size, scientific evidenced reviewed, appropriateness of recommendations, and generalizability (Dang & Dearholt, 2018).

Table 2 provides a summary of the rating system for quality of evidence.

**Table 2**

*Quality of Evidence*

Quality of Evidence	Criteria
A	High: Conclusive, consistent, sufficient, generalizable; sufficient sample size for study design; adequate control, definitive conclusions, consistent recommendations based on comprehensive literature review that includes thorough references to scientific evidence.
A-B	High-Good: Fairly conclusive, consistent, sufficient evidence. Meets some criteria from both A and B levels.
B	Good: Reasonably conclusive, consistent results, sufficient sample size for study designs; reasonably consistent recommendations based on fairly comprehensive literature review that includes references to scientific evidence. However, there may be some conflicting evidence.
C	Low: Inconclusive, inconsistent, insufficient evidence, insufficient sample size for the study design, inconsistent results, little references to scientific evidence. Conclusions cannot be drawn.

Evidence related to this project was identified by performing a comprehensive search using Worldcat, Cochrane Central Register of Controlled Trials (via Wiley), Cochrane Library, Clinical Trials.gov, PubMed Central, Cumulative Index to Nursing and Allied Health Literature, and Medline. Citations were limited to the English language. A literature review was initiated by conducting a search using the key words colorectal cancer, colorectal cancer screening, fecal occult blood tests, fecal immunochemical tests, FIT screening, colorectal neoplasms, positive FIT, text messaging and colorectal cancer screening, CRC screening guidelines, CRC screening reminder systems, increasing colorectal cancer screening, colorectal cancer screening knowledge. Over 120 articles were found. The literature search was further narrowed by searching for articles that covered CRC screening guidelines, interventions, and stool-based testing. Articles that dealt with screening of adults younger than 50 years of age were excluded from the literature search since routine screening of these patients was not indicated in current clinical practice guidelines. I conducted a review of anecdotal, qualitative, and quantitative studies as well as established clinical practice guidelines from professional associations. A total of 15 articles were used for an in-depth synthesis of the literature for this project. Appendix B outlines the evidentiary table and rating of the evidence for this project.

Historically, CRC screening rates are lower in FQHCs as compared to the rest of the population and consistently lower among those of low-income backgrounds, those with Medicaid or those who are uninsured (Adams et al., 2018). FQHCs who serve mostly minorities that are uninsured and meet poverty guidelines are not showing the same CRC screening rates as the rest of the population. There are many interventions that can be implemented at the patient, healthcare organization, and community levels to address these CRC screening rates. The widely used screening test in FQHCs has been the FIT (Adams et al., 2018). Many interventions have



been used to improve CRC screening rates in FQHCs with varying results. Group education about CRC screening was the least chosen intervention by FQHCs while mailed and telephone reminders was the most widely used (Adams et al., 2018). These findings along with my assessment of the family medicine east campus clinic assessment guided my review of the literature and evidence. The consensus from the literature is that CRC screening rates have increased for the overall population but this increase is disproportionate and not representative of those considered to be of low socioeconomic status, uninsured, covered by Medicaid, minorities (Hispanic and African-American), or meeting poverty guidelines (Adams et al., 2018). The national CRC screening rate in 2018 for all FQHC adults, from 50-75 years of age, was 44.1% (National Colorectal Cancer Roundtable, 2019). The combined CRC screening rate in 2018 for all Texas FQHC adults, from 50-75 years of age was 35.72% (HRSA, 2018a). My healthcare organization's CRC screening rate in 2018 for all adults, from 50-75 years of age was 33.64% (HRSA, 2018a). Stool based or visual screening for CRC in adults in Texas, 50 years or older received a national ranking of No. 48 with a 61.5% screening rate compared to a 68.9% national screening rate in 2016 from the general population (American Cancer Society, 2018a). As previously described, my clinic's population has a majority of patients that are minorities, uninsured or on Medicaid/CHIP/other public assistance, who meet the poverty guidelines. Currently, the family medicine east campus clinic has implemented free FIT testing for all patients in hopes that the financial burden of a preventive service would not present as a barrier to completing the testing. Additionally, the clinic was offering a \$10 incentive upon return of the completed test to the clinic. These two strategies were the only interventions being utilized in by the clinic to improve CRC screening rates. Mehta et al. (2019) concluded from a randomized control trial of 897 participants that incentives with a value of \$10 or less had no impact on FIT

completion rates. Gupta et al. (2016) conducted a randomized, comparative effectiveness trial of 8,565 participants considered to be low-income and uninsured. The conclusion was that financial incentives of \$5 or \$10 had no impact on completion of CRC screenings (Gupta et al., 2016).

The USPSTF (2016) updated the 2008 guidelines, which provided recommendations for CRC screening after reviewing the effectiveness, harms, and screening tests performance in order to provide recommendations for specific screening tests by conducting a systematic evidence review. Outcomes from models in the Cancer Intervention and Surveillance Modeling Network revealed that between 12-20 deaths from CRC per 1,000 people were averted due to annual FIT screening (USPSTF, 2016). Screening for CRC is an underused preventive health strategy in the United States (USPSTF, 2016). The USPSTF (2016) suggests screening for CRC beginning at 50 years of age and proceeding until 75 years of age. The most important action when considering the risks and benefits of each screening test is simply for the patient to be screened (American Cancer Society, 2018b). The FIT is the least expensive option for CRC screening with the least amount of risks. FIT testing is often free for those who are uninsured or underinsured.

The MSTF on CRC which consisted of the American College of Gastroenterology, the American Gastroenterological Association, and the American Society for Gastrointestinal Endoscopy released a consensus guideline recommending that a systematic approach for recommending CRC screening testing would be taken with average risk adults, 50-75 years of age (Rex et al., 2017). The MSTF recommended that a colonoscopy be suggested first as the primary CRC screening test. If the patient declined a colonoscopy, then the primary care provider should recommend a stool-based test such as a FIT (Rex et al., 2017). The MSTF considers a colonoscopy and a FIT as tier-one testing and encouraged an opportunistic approach

when offering sequential screening (Rex et al., 2017). There are nine options available for CRC screening. The MSTF recommended that when a patient is only offered “two” screening options, it is highly likely that the patient will follow through and complete the screening (Rex et al., 2017). The MSTF also took the position that the best test is the test that is completed (Rex et al., 2017).

Ishida et al. (2019) conducted a quality improvement project utilizing 100 patients in a FQHC to improve the CRC screening ordering process in order to ensure that more patients completed CRC screenings. Twenty patients who were eligible for screening received orders initiated in the clinic by medical staff (providers and/or unlicensed assistive personnel), 40 patients received automated telephone outreach calls reminding them to get their CRC screening orders from the care coordinators, and 40 patients received calls from the care coordinator to obtain an order for CRC screening. MAs offering opportunistic screening orders based on clinic protocols resulted in the highest percentage of patients accepting CRC screenings with patients preferring this outreach approach compared with the care coordinator outreach or automated voice messages (Ishida et al., 2019). Ishida et al. noted that CRC screening has long been exclusively the purview of individual providers; therefore, expanding unlicensed assistive personnel participation in CRC screening campaigns can make a significant impact on the health of the communities.

Coronado et al. (2014) conducted a qualitative study of 26 participants from a FQHC to develop FIT kit directions that were easy to read and be understood by a diverse population using the least amount of words in hopes to increase CRC screening rates. There was a step wise grouping of mailings sent to the participants with a project introduction letter sent first followed by a FIT kit with two sets of directions, one in English (200 words) and another in Spanish (215

words) along with photographs as well as the revised directions that had the least amount of words in English (4 words) and in Spanish (5 words) that also included pictograms. A final mailing that included a reminder postcard was also sent (Coronado et al., 2014). All of the patients favored the revised directions with pictograms over the regular bilingual directions. Providing simplicity in easy to understand directions on how to complete a FIT kit may help raise CRC screening rates among low-education and non-English-speaking populations (Coronado et al., 2014).

Dougherty et al. (2018) conducted a systematic review and meta-analysis of 73 randomized control trials with a total of 366,766 participants. Dougherty et al. identified that patient navigation and stool-based testing outreach each produced a significant increase in completion of CRC screenings while combining both of the interventions produced an even greater increase in CRC screenings. Reuland et al. (2017) conducted a randomized clinical trial of 265 patients with a combination of a decision aid (video) and patient navigation. The two interventions were responsible for an increase in CRC screening rates. Davis et al. (2018) performed a systematic review of 27 studies and discovered that distribution of stool-based testing in clinic by providers and clinical staff, mailed stool-based testing kits program, inclusion of pre-postage paid envelopes to return completed kits, and patient reminder/call were highly effective in increasing CRC screening rates. Cunningham et al. (2019) conducted a quality improvement pre-post intervention study that identified effective and cost-efficient multicomponent interventions including educational postcards, electronic education, MA and registered nurse education, and provider ordered screening during in office visit at two different family care centers increased CRC screening rates. Coronado et al. (2018) conducted a cluster, randomized, pragmatic clinical trial of 41,193 adults to determine the effectiveness of the auto

mailing of FIT kits based on information contained in the EHR as a part of standard of care in FQHC. It was found that a mail-based CRC screening outreach program can improve CRC screening rates with the FIT and other secondary screening interventions. The outreach program can have a positive impact on clinical workflows. However, additional strategies may be needed in the health center settings that lack resources who are considering implementing a mail-based CRC screening program. Coronado et al. (2017) conducted a randomized control trial of 2,772 participants that were stratified by clinic to compare the effectiveness of various automated versus live strategy reminders for a direct-mail FIT program. The data suggested that FIT reminders that included a live call were more effective than reminders that relied solely on written communication such as a text message or letter (Coronado et al., 2017). The effectiveness of reminders must be weighed against the costs of delivering those reminders and patient experiences with receiving reminders. Automated phone calls and text messages are the least costly options to implement, yet live reminders may allow staff to address or triage other patient healthcare needs. Reminders that included a live call performed better than reminders that relied on written communication. For patients who preferred speaking Spanish, the combination of the automated and live phone calls produced the highest return rates (Coronado et al., 2017). Live communications, especially with Spanish speaking patients, had a positive impact on CRC screening completion rates.

Robertson et al. (2017) compared how effective the FIT was with other secondary preventive tests for CRC screenings in order to provide recommendations from the MSTF on CRC. A systematic and meta-analysis review of randomized control trials, cohort, cross-sectional, and single comparative studies were completed, and the FIT was determined to have an overall sensitivity of 79% and specificity of 94% for CRC. The key quality metrics to

measure in a FIT program are FIT completion rates of those offered the FIT, the number of patients returning unacceptable specimens that went beyond the return time as determined by manufacturer guidelines, and colonoscopy follow up rates for those patients with a positive FIT (Robertson et al., 2017). Selby et al. (2019) conducted a mixed-methods study of a retrospective longitudinal cohort of 160,051 participants who completed and received a positive result on the FIT. The purpose of the study was to improve strategies for follow-up after a positive FIT was identified since the effectiveness of the FIT depends on prompt colonoscopy investigation follow-up. The outcome that was measured was improving timeliness of colonoscopy follow-up after receiving a positive FIT result as noted in the laboratory data of the EHR. The current rates of colonoscopy follow up after a positive FIT result was 50%. The evidence-based research notes that as the 180-day threshold is surpassed, the chances of CRC increases (Selby et al., 2019). The interventions used by Selby et al. included scheduling a colonoscopy follow-up within 30 days of a positive FIT, creating a registry for the tracking of participants with positive a FIT, and using navigators to contact participants for a colonoscopy follow-up.

Gonzalez et al. (2017) conducted a systematic review of a variety of randomized control trials, case-control studies and observational cohort studies to describe the incidence, prevalence, morbidity and mortality of CRC internationally. The purpose of this review was to offer evidence-based CRC interventions in order to provide appropriate guidelines for the primary care practitioner as it relates to primary and secondary CRC preventive services. CRC risks can be decreased through the implementation of primary (obesity prevention, nutrition counseling and tobacco cessation) and secondary (visual or stool-based screenings) interventions (Gonzalez et al., 2017). Primary care practitioners are at the forefront of primary care and are strategically positioned to address factors such as nutrition and weight loss counseling, tobacco cessation, and

alcohol use. In order to increase CRC screening rates in the primary care practice, there must be an effective use of both clinical information systems (EHRs and registries) and system design (patient and provider reminders) (Gonzalez et al., 2017). The lack of implementing secondary screening strategies can have a negative impact on patient outcome as it relates to CRC screening, early diagnosis, and treatment (Gonzalez et al., 2017). Gonzalez et al. (2017) also addressed the importance of secondary screening approaches in average risk adults and added that clinical information systems (EHR/registry) and system designs (patient/provider reminders) can have a negative impact if the use of such systems is not maximized in an effort to ensure appropriate screening, detection, and treatment of patients who present with the early stages of CRC. Providing preventive care in the primary care setting that addresses risks associated with CRC can help decrease the incidence of CRC.

Hirst et al. (2017) conducted a two-armed randomized control trial with 8,269 screening-qualified adults. The primary objective was to test the viability of a text-message reminder to encourage return of completed fecal occult blood tests (FOBTs). The secondary objectives were to determine whether a text-message update was increasingly compelling in improving the completion of CRC screenings among first-time invitees than repeat invitees and to determine the adequacy of the text messages by testing the viability among the non-responders who additionally had registered cellular number. In spite of the fact that text-message updates did not essentially increase the general populace's return of completed FOBTs, the improvement among first-time invitees was empowering (Hirst et al., 2017). Utilizing text message reminders for first time invitees to return CRC screening kits can be promising (Hirst et al, 2017). Schwebel and Larimer (2018) provided a systematic narrative review of 162 articles on the application of text message reminders in the primary care arena. The results of this systematic review show that

short message service (SMS) updates can be successfully executed worldwide and in an assortment of settings to help improve healthcare (Schwebel & Larimer, 2018). SMS updates show amazing promises as an automated support tool in the primary care environment. This systematic review found 86% (48/56) of studies involving appointment reminders and 85% (83/97) of the studies involving medical adherence reminders revealed positive outcomes related with SMS messages (Schwebel & Larimer, 2018). Singal et al. (2016) conducted a three-year randomized control trial of 5,999 patients to compare initial screening participation across the three groups (FIT outreach, colonoscopy outreach, and usual care) among individuals with at least one year of post-intervention follow-up. This study found that mailed outreach invitations can significantly increase CRC screening rates among underserved populations. Effective CRC screening is dependent on completion of the entire screening process, which includes repeat screening in those with normal tests or follow-up evaluation of abnormal screening results (Singal et al., 2016). Gordon and Green (2015) conducted a cross-sectional survey of 500,550 health plan members who received a computer-generated letter from their primary care doctor telling them that the FIT kit was coming, why it was important to get screened for CRC, and that the test was free to all members. The purpose of this study was to recognize steps that could be taken to expand take-up and yearly utilization of the FIT and improve CRC screening efforts. The FIT kit arrived at patients' homes approximately 1 week after being seen by the provider along with a multilingual flyer about the importance of being screened for CRC and a pre-paid cardboard mailer to send the stool sample to the processing lab. Members who did not send in their completed FIT samples received an automated phone reminder approximately 4 weeks after the mailing and a follow-up letter 2 weeks after that. In addition, medical facilities were encouraged to implement CRC screening "in reach" activities, offering members, whose EHR



showed they were past due for CRC screening, a FIT kit at primary care visits or flu shot clinics. Gordon and Green identified barriers to the completion of the FIT kit such as feelings of discomfort, disgust, embarrassment with collecting the stool, thinking it is unnecessary, fatalism/fear, and too difficult to use. Approximately half of FIT kit users suggested adding a disposable glove, extra paper, and wider-mouth tube to the kit (Gordon & Green, 2015). Providing patients with information that addresses factors hindering the completion of FIT has a positive impact on CRC screening completion rates.

The review of the evidence revealed several interventions that can be implemented to increase CRC screening rates. There is consensus that CRC screening is recommended for adults between the 50-75 years of age. Patients seem to be receptive to MAs offering opportunistic screening during office visits, which has resulted in higher CRC completion rates. The most important take away for the patient is to complete the CRC screening. Financial incentives have little to no impact on CRC completion rates. The FIT is the least inexpensive and least invasive option for CRC screening posing the least amount of risks to the patient and is often times free for those who are uninsured or underinsured. The FIT and colonoscopy are considered tier one tests. The evidence suggests that offering one or two choices such as the FIT or colonoscopy as CRC screening methods during a provider visit increases the likelihood of completing the CRC screening. The evidence also suggests that supplementing the FIT kit with simple to read instructions and a glove increases CRC screening completion rate. Patient access to live communication about stool-based testing, reminder calls, and having the patient actively participate in viewing instructional videos on how to perform proper stool collection has also increased CRC screening completion rates. While automated phone calls and text messages can

be inexpensive options; live reminder calls and live communication with providers and office staff yield higher CRC screening completion rates.

The key quality metrics to review in a FIT program are FIT completion rates of those offered the FIT, the number of patients returning unacceptable specimens that went beyond the return time as determined by manufacturer guidelines, and colonoscopy follow up rates for those patients with a positive FIT. Additionally, focusing on improving strategies for follow-up care after a positive FIT was identified as an important factor in reducing CRC. This includes improving timeliness of colonoscopy follow-up to less than 180 days after receiving a positive FIT result. Scheduling a colonoscopy follow-up within 30 days of a positive FIT, creating a registry for the tracking of patients with positive FIT results, and using navigators to contact participants for a FIT/colonoscopy follow-up have also improved CRC screening rates in the primary care setting. The goal is to detect CRC early since this type of cancer is 100% treatable and the likelihood of long-lasting complications is minimized when treated early.

## **Methods**

### **Project Description**

The plan-do-study-act (PDSA) model for clinical improvement served as a framework for implementing a project over a 10-week period to improve patient CRC screenings for adult patients between 50-75 years of age using the USPSTF (2016) and HRSA (2018b) clinical practice guidelines (Coury et al., 2017). The PDSA model for clinical improvement was also used to identify progress towards achieving the project's objectives (Coury et al., 2017). Data was collected and reviewed in order to determine gaps in meeting USPSTF and HRSA clinical practice guidelines for CRC screenings and interventions were planned based on this information (plan). The planned interventions were then implemented in the family medicine east campus

clinic (do). Charts were audited looking at the data for trends and progression towards meeting the project objectives (study). Modifications were then made based on personal observation of the clinic's performance in conjunction with the information obtained from the data review, which led to the next PDSA cycle (act) (Coury et al., 2017).

Data was collected from the family medicine east campus clinic's EHR from the September 01, 2019 to September 30, 2019 dates of service to evaluate the clinic's performance with CRC screenings. All patient encounters that were part of the clinic's workflow were reviewed to determine quality care gaps that impacted performance of CRC screening completion rates. A secondary review was performed to ensure that patients were not counted twice and that only average risk patients were included in the data abstraction. Patients with a high risk of developing CRC were not included in this project, as these patients had already been flagged for referral. Once data was collected, I reflected on the current process the family medicine east campus clinic was using for CRC screenings as described in the assessment section. I also sought input from the providers and staff on perceived obstacles to CRC screenings. This helped me to formulate the interventions that would be needed in the clinic to meet the USPSTF and HRSA clinical practice guidelines for CRC screening.

The interventions that were developed for this project consisted of the following:

- a one-hour in-person briefing and orientation session presented by myself on the importance of CRC screening, the current USPSTF and HRSA CRC screening clinical practice guidelines, the clinic's current performance in meeting these guidelines, as well as details about the project
- patient education about CRC and the importance of CRC screening

- use of a patient education video on collection of the FIT sample in conjunction with distribution of a FIT kit by the MAs during the patients' clinic visits
- development and use of a clinical tracking sheet for compliance by both the clinic providers and staff as well as the patients
- live phone communication with patients who did not return FIT samples to remind them to complete the specimen collections
- review of the EHR capabilities for CRC screenings with providers
- daily chart audits
- referrals for patients with positive FIT results documented in the EHR

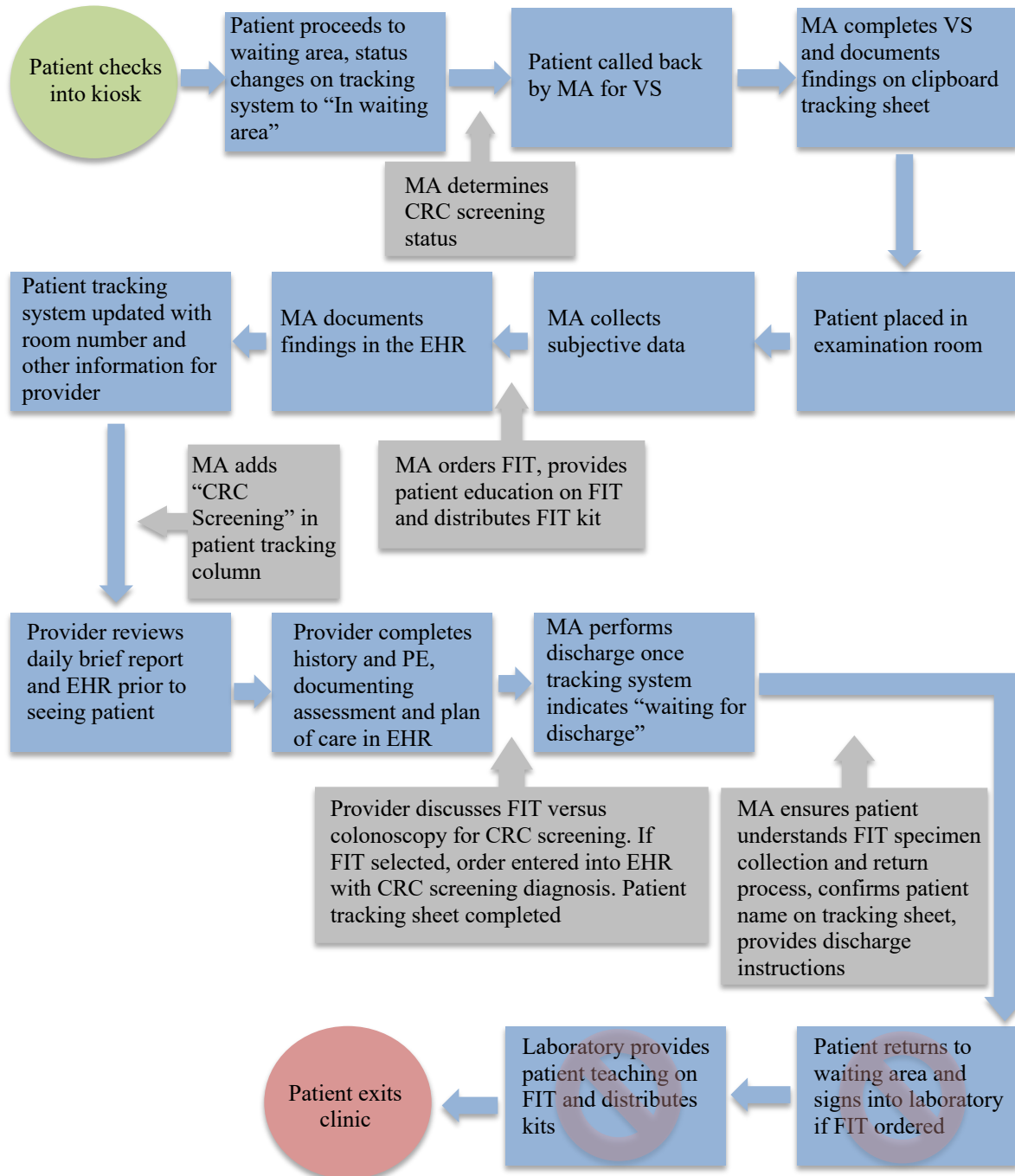
The objectives for this evidenced based project were to:

- increase the percentage of patients meeting screening guidelines who receive an order for CRC screening in the EHR on the day of their patient visit from 46% to 100%
- increase the percentage of patients who have FIT results entered into the EHR from 26% to 75%
- increase the percentage of patients with positive FIT results documented in the EHR who receive a referral for follow up testing within 2 weeks from 20% to 100%

Figure 3 provides an overview of the interventions for this project related to the family medicine east campus clinic's current processes for CRC screening. The grey areas represent the project interventions.

**Figure 3**

*Flowchart of Current CRC Screening Process with Project Interventions*



Evaluation methods were tailored specifically to each objective. Objective 1 was measured through chart audits of the EHR noting the percentage of eligible patients who had a valid order for CRC screening on the day of visit in the encounter module or the laboratory module of the EHR. Objective 2 was measured through chart audits of the EHR noting the number of patients who had FIT results documented in the laboratory module component of their individual files. Objective 3 was measured through chart audits of the EHR noting patients with documented positive FIT results in the laboratory module component of their individual file that also had a referral for follow-up testing within 2 weeks of the date the FIT results were entered into the EHR. The lack of documentation in the EHR for each of these objectives was interpreted as a negative finding in meeting the project objectives.

Once implementation of the interventions was underway, a retrospective chart audit was completed weekly along with a review of the CRC screening quality of measures performance scores for the clinic as well as the individual providers that was obtained from the organization's quality performance dashboard. A Microsoft Excel spreadsheet registry (chart-audit tool) was created and housed in Microsoft SharePoint with shared access provided to the clinic's population health manager in order to conduct outreach activities with those patients whom had not returned a completed FIT kit 2 weeks after the laboratory order for a FIT was entered by clinic staff. The spreadsheet was then uploaded into Microsoft Access where a CRC screening registry was created and utilized by myself to determine progress towards meeting the project objectives.

The chart audit of the family medicine east campus clinic providers for September 2019 yielded 200 patients who met the guidelines for CRC screening and served as a baseline for comparison and trending once implementation of the project began. My goal during the

implementation phase of the project was to conduct a weekly chart audit of at least 25% of the records in order to determine progress in meeting the quality improvement project outcomes and to make any adjustments to the interventions if needed. Additionally, the CRC screening completion rates were collected by myself from the quality performance dashboard and shared with clinic staff and providers on a weekly basis to assist them in gauging their progress towards achieving the agreed upon objectives.

### **Provider and Staff Survey**

Providers and staff were asked to complete a “Health Care Systems for Increasing and Tracking Colorectal Cancer Screening Tests” pre-intervention survey from Harris et al. (2010) to determine baseline knowledge about CRC screenings. The survey gauged (a) their individual approaches to CRC screening, (b) their views on the effectiveness of CRC screening testing, (c) their views on appropriate follow up for positive stool based tests, (d) their understanding about the family medicine east campus clinic’s current CRC screening process, (e) their understanding about the patients’ backgrounds, (f) their understanding about the staff’s medical preparation, (g) and their understanding of the providers’ backgrounds including primary medical specialty, status of board certification in the specialty, year of graduation, and highest clinical degree obtained. Survey data was reviewed to determine what information needed to be included in the 1-hour educational session.

### **In-person Briefing and Orientation**

Prior to implementation of the project a briefing was held with the family medicine east campus administration outlining the project and the anticipated outcomes. This briefing helped to ensure that this project was in line with the organization’s goals and cooperative participation by

the family medicine east campus clinic. Administration granted permission to proceed with implementation of the project.

In order to prepare the providers and staff to implement this project, a 1-hour briefing and orientation was provided outlining: (a) CRC screening risks and benefits, (b) the appropriate use of the terms FIT versus FOBT, (c) the 2016 USPSTF and 2018 HRSA guidelines for CRC screening, (d) a review of the HRSA UDS reports for the family medicine east campus clinic highlighting the quality of care measures for CRC screenings, (e) the planned CRC screening interventions for the project, (f) and the timeline for implementation.

I provided an overview of the quality improvement project that would be implemented in the family medicine east campus clinic in order to meet the 2016 USPSTF and 2018 HRSA CRC screening guidelines and the metrics set by the organization's corporate office for the clinic site. The presentation began by reviewing the importance of CRC screening for adults 50-75 years of age as well as the risks and benefits associated with the various methods of CRC screening. I then highlighted the differences between FIT and FOBT as some of the staff were using these terms interchangeably. I also provided a summary of the family medicine east campus clinic's performance measures on CRC screening. This provided a foundation for the purpose of implementing the 2016 USPSTF and 2018 HRSA CRC screening guidelines and the interventions planned for this project that are discussed in detail later in this section. At this time, I presented the clinical pathway that was developed for this project that outlined the process the family medicine east campus clinic would follow for CRC screening, which consisted of the following:



- the patient presents to the clinic
- screening of EHR and review of the daily brief report along with the patient intake was completed
- the patient's EHR is reviewed to determine if the patient is 50-75 years of age and has not had a CRC screening within 1-10 years depending on the method of CRC screening used
- the patient and staff discuss the need for a CRC screening and the appropriate available screening options offered by the clinic (FIT versus colonoscopy)
- if the patient chooses the FIT, either the MA or provider enters the order into the laboratory module of the EHR. If the patient desires a colonoscopy then the provider enters the GI referral into the EHR
- during the patient's current clinic visit, a FIT kit is provided to those patients opting for CRC screening using the FIT method
- a 5 minute InSure ONE patient education video is played for the patient covering instructions on how to collect the stool specimen for the FIT kits being used by the clinic
- the patient is provided the Colon Cancer Screening: Care Instructions as part of the discharge paperwork
- the provider documents the appropriate billing code for CRC screening in EHR for the patient's current encounter
- the patient is discharged from the appointment
- the patient collects the stool specimen at home according to the FIT kit instructions and returns the specimen to the clinic where a \$10 gift card is provided. The patient

- also has the option of delivering the specimen to any clinic or designated laboratory within the organization or could mail the specimen in to the laboratory
- once the laboratory processes the specimen, the results are entered into the patient's EHR in the laboratory module by the laboratory who processes the specimen
  - if the findings are positive, then a GI referral is entered within 2 weeks of receipt of the laboratory results

Following the presentation of the clinical pathway that would be used for this project, I elaborated on various aspects of the clinical pathway. This began with the "Colon Cancer Screening: Care Instructions" available in the family medicine east campus clinic patient education section of the EHR being distributed to the providers and staff for review. I demonstrated how to locate and access the CRC screening patient education in the EHR education section and how to print this information so it could be attached and distributed to the patient at discharge. I emphasized the importance of effectively using the established standing orders to document and distribute FIT tests for those patients who meet the CRC screening guidelines during their clinic visit, which ensured real time availability of the CRC screening test. During the briefing session, a short video lasting approximately 42 seconds was shown to the providers and staff to familiarize them with the InSure ONE FIT screening process. I also showed the 5-minute InSure ONE FIT patient education video that was used with this quality improvement project, so the providers and staff were aware of what instructions that patients were receiving regarding collection of stool specimens. The InSure ONE FIT patient education video was available in both English and Spanish. Lastly, I highlighted the directions for the appropriate use of the family medicine east campus clinic tracking sheet. Before the presentation was concluded, I addressed all provider and staff questions and/or comments.

**FIT Test Order**

As the first step in the clinical pathway, the MAs reviewed the daily briefs and appointment schedule for patients who were to be seen that day. The MAs then reviewed the EHRs of those patients to determine if the patients met the USPSTF and HRSA guidelines for CRC screening. This review of the EHR consisted of reviewing any comments noted on the appointment schedule screen, which may have addressed CRC screening. These types of comments were entered by the onsite champion no later than the evening prior to the day of the appointment. The EHR laboratory data tab was opened to determine if there was a result for a FIT within the last year or stool DNA test within the last 3 years. The diagnostic tab and other documents tab were reviewed to determine if the record contained a scanned colonoscopy report with a date within the last 10 years or a sigmoidoscopy report with a date within the last 5 years. Once the full review of the EHR was completed and the patient met the USPSTF and HRSA guidelines for CRC screening, the daily brief report was updated accordingly for accuracy and confirmation of data reported.

During the check-in process, if the patient was identified as meeting the guidelines for CRC screening on the day of the office visit, the MA provided the patient with information regarding CRC and the importance of CRC screening. The MA then discussed with the patient the two options offered by the clinic for CRC screening. If the patient opted for a FIT test, the standing protocols were used to place a laboratory order in the EHR for a FIT test with a notation made in the EHR under the “Today’s Patient Tracking Column” using the description “FIT ordered” before updating the patient’s status to “waiting for provider.” If the patient desired a colonoscopy as opposed to a FIT, the MA entered a notation in the EHR under the “Today’s Patient Tracking Column” using the description “GI referral needed” before updating the

patient's status to "waiting for provider." Documenting the patient's choice in the "Today's Patient Tracking/Room Column" of the EHR helped to ensure that the MA was using the current standing protocols for those who meet the USPSTF and HRSA guidelines for CRC screening. If the patient was undecided about the type of CRC screening test desired, then the MA entered a notation in the EHR under the "Today's Patient Tracking Column" using the description "CRC Screening" before updating the patient's status to "waiting for provider." The family medicine east campus clinic tracking sheet was used by the MAs for tracking patients who receive an order for a FIT.

I reviewed the family medicine east campus clinic tracking sheet daily to determine if CRC screenings were completed as indicated by a check and compared this with the laboratory data section to determine if a FIT order was placed or by reviewing the encounter notes to identify if a GI referral for a colonoscopy was made. The status of FIT orders was tracked in the Excel spreadsheet. This data was useful in determining the appropriate use of the tracking sheet and effectiveness of the quality improvement program.

### **FIT Kit Distribution and Education**

The providers reviewed the patients' EHR and conducted their appropriate examinations. If patients were between 50-75 years of age and a description of "CRC screening" was noted in the EHR in the patient tracking column, then the providers followed the same process as the MAs in regard to ordering the appropriate CRC screening test.

If a patient opted for a FIT, the clinic staff ensured that the patient received a FIT kit prior to being discharged. The clinic chose to use the InSure ONE FIT kits. Documentation of FIT kit distribution was noted on the family medicine east campus clinic tracking sheet. The 4 minute 59 second instructional video from the manufacturer was copied to a digital video disc

(DVD). This instructional video from InSure ONE FIT included instructions on how to collect the stool specimen, how to properly place the stool specimen on the collection card, how to properly complete the specimen label, and how to properly attach the label to the card.

Additionally, the instructional video contained information about CRC screening, recommended intervals for FIT testing, and why the test was ordered. This video was available both in English and Spanish. Patients were given a choice as to which language they preferred when viewing the instructional video. Prior to discharge, patients opting for FIT CRC screening viewed the video in the examination room or designated office in the clinic.

In preparation for discharge, the MAs ensured that eligible patients had received the FIT kit, watched the instructional video, and had a copy of the Colon Cancer Screening: Care Instructions as part of the patient's discharge paperwork. The FIT kit was given to patients in a biohazard bag that contained the FIT kit, an examination glove, and a plastic bag (discrete bag) that could be used to drop off the specimen inconspicuously. Patients were instructed to return the FIT kit to the family medicine east campus clinic laboratory, any organizational clinic laboratory, or any contracted diagnostic laboratory. Patients were also informed that once the FIT kit was returned, they were eligible to receive a \$10 gift card. The Colon Cancer Screening: Care Instructions contained information about CRC, CRC screening tests with test descriptions, appropriate tests based on risk factors, and signs and symptoms to report to providers that warranted CRC screening testing. The Colon Cancer Screening: Care Instructions were available in English and Spanish. The discharge paperwork also included information on where the stool specimen could be returned for processing.

Once discharge of the patient was completed, the MA entered a checkmark in the column marked "FIT Kit Given" on the family medicine east campus clinic tracking sheet. This step

helped to ensure that the FIT kits were distributed, the instructional video was watched, and the Colon Cancer Screening: Care Instructions were provided to the patient at discharge. Use of the tracking sheet also helped to ensure that FIT kits were distributed during current clinic visits. I reviewed the family medicine east campus clinic tracking sheet daily to determine if FIT kits were distributed for those with FIT orders. The status of FIT kit distribution was tracked in the Excel spreadsheet. The data helped to determine the appropriate use of the clinic tracking sheet and effectiveness of the quality improvement program.

### **Provider Responsibilities**

Prior to entering the examination room, providers reviewed the daily brief and patients' EHR in the order history section to look for completed and outstanding laboratory orders, which are valid for 1 year. Additionally, the providers reviewed the EHR care guidelines section, categories/diagnostics section, and referral correspondence section for any endoscopic procedure reports related to CRC screening. To complete the review, the providers also checked the room column to verify if "FIT ordered", "CRC screening" or "GI referral needed" was annotated in order to ensure that CRC screening was being addressed during the current office visit if eligible patients were due for CRC screening.

During patient encounters, providers discussed the FIT and colonoscopy options for CRC screening of eligible patients. If patients chose the FIT, the providers would order a FIT for those patients who had not received a FIT order in the EHR by the MAs during patient check-in. If patients chose a colonoscopy, the provider would order a GI and colonoscopy referral in the EHR. Distribution of the FIT kit followed the process previous outlined. Providers answered any questions that patients had regarding the CRC screening process.

As part of completing patients' visits, providers documented appropriate diagnosis codes into the EHR for billing and tracking purposes. Visual cues in the EHR helped to ensure that the MAs and providers were documenting orders for CRC screening in the EHR. The providers were required to document CRC screening diagnosis codes in the plan section of the EHR. This was necessary in order for the FIT order and/or GI referral to be attached to the billable and reimbursable preventive screening for the current patient office visit. Providers used the International Classification of Diseases code Z12.11, which indicated that CRC screening was addressed during the encounter. Providers were also required to document that the Colon Cancer Screening: Care Instructions were included in the patient's discharge plan.

### **Patients Completing CRC Screening Process and Referrals**

Patients who received a FIT kit were entered and tracked on a spreadsheet using the following data points: (a) patient's initials, (b) date of birth, (c) age at time of visit, (d) gender, (e) zip code, (f) insurance status, (g) race, (h) ethnicity, (i) date of office visit, (j) type of CRC screen received, (k) coding/billing status for CRC screening, (l) FIT distribution status, (m) date FIT resulted negative if applicable, (n) date of live communication, (o) date FIT resulted positive if applicable, (p) date patient contacted in reference to FIT result, (q) date of follow up appointment, (r) disposition/referral status, (s) coding/billing status for positive FIT results, (t) provider type, and (u) system error identification for those EHRs with evidence of CRC screening. Initially, I tracked the patients, however, the population health manager assumed responsibility for tracking the patients and making live phone communications with the patients who did not return a FIT kit after 2 weeks. If at the end of 2 weeks from the date of the FIT order no results were available in the EHR, then patients were contacted by the population health manager.

Once the laboratory received stool specimens, the FIT specimens were processed and results were entered into the patients' EHR. The Excel spreadsheet was used by the onsite champion for tracking patients who had results in the EHR by indicating a date in the positive or negative result column as indicated. On a weekly basis, the onsite champion and I entered results in the Excel spreadsheet. Successful specimen collection was determined based on whether a result was noted within 2 weeks of the visit in the Excel spreadsheet as indicated by a date in either the negative or positive result column based on FIT results in the EHR. If the result columns were blank, then this indicated that the stool specimen was not returned. The onsite champion and I updated the FIT results weekly. The onsite champion used this data to provide outreach efforts at 2 weeks from the date of the visit in the form of live phone communication to encourage patients to complete and return the FIT. The EHR was updated with a note documenting the patient communication and the reason for not returning the completed FIT. If results were available in the laboratory module, then I entered the date the FIT results were entered into the EHR in the appropriate column of the spreadsheet. If the FIT results were negative as indicated by "not detected" in the EHR laboratory module, then no additional data was entered into the spreadsheet. If the FIT results were positive as indicated by "detected" in the EHR laboratory module, then additional data was needed besides the date of the positive FIT result.

The final step involved notification and recommendation/disposition of those patients who completed the FIT and had a "positive" result in the laboratory results section of the EHR as indicated by the notation "detected." All positive results were identified by using a red font in the positive FIT result date column in the Excel spreadsheet that contained the CRC screening tracking sheet information. The onsite champion notified providers of positive results via internal



messaging in the EHR if an appointment or disposition/referral was not noted within 1 week of a positive result. In addition to the positive FIT result tracking by the population health manager, the providers checked their PAQ daily to identify any patients with positive FIT results. There was some variation in how each provider notified patients of the positive FIT results. Provider A created a clinical task in the EHR for the MAs to notify patients of positive results and the need to schedule a follow-up visit. Provider A also verbally informed the MAs that there were clinical tasks in the EHR for positive FIT results. Provider B printed a copy of the FIT positive result and provided it directly to the MA instructing the MAs to notify patients of positive results and the need to schedule a follow-up visit. The MAs proceeded to call the patient about the positive test results and scheduled the patients for follow up appointments to address the results with the providers. Patients had a choice of coming to the clinic to discuss the results or talking with providers via telephone on a designated date and time to discuss the results. Once the MAs notified patients of the results and scheduled a follow-up appointment, they entered an update in the EHR documenting the conversation, the reason for the follow-up visit, and the patient's preference for appointment (in office or via telephone). To complete this process, the MAs either marked the clinical task as completed in the EHR for provider A or initialed the printed copy of the positive FIT result before placing the sheet in provider B's folder in the combination locked records room. The date the provider entered an encounter addressing the positive FIT result along with a recommendation/referral to GI for a diagnostic colonoscopy was entered into the spreadsheet. A colonoscopy is required if a FIT result is positive (American Cancer Society, 2018b). This process provided closed loop communication between the providers and the MAs in addressing positive FIT results. The goal was to notify the patient within 14 days of the positive result to discuss next steps.

The evaluation of timely dispositions for positive results was determined by the date entered in the EHR for positive results and referrals to GI for diagnostic colonoscopies. The onsite champion and I tracked positive FIT results without an appointment, disposition, or referral on a daily basis after the first week of the project implementation. This data helped to determine if referrals for positive FIT results and appropriate dispositions were provided within 2 weeks of a positive result. This data also helped to determine the effectiveness of the quality improvement program.

## **Organizational Barriers and Facilitators**

### ***Barriers***

There were several organizational barriers to implementing this quality improvement project. The first barrier was a lack of space to allow patients to watch the 5-minute instructional video on the FIT kit. There were two providers using a total of six rooms with appointments scheduled every 10 minutes. The check-in area was a two-bay open area separated by a partition that did not allow for viewing of the instructional video in this area due to a lack of privacy and time constraints since a large volume of patients had to be processed through this area. There was one office, which served a dual purpose for telemedicine appointments and diabetic eye examinations. The laboratory area was only large enough to accommodate one patient and two laboratory technicians. I purchased a portable DVD player for ease of mobility in watching the instructional video while waiting for the provider in the examination room or use in the designated office space.

Current tracking methods of outcome measures for CRC screening did not indicate if the provider failed to order the screening or if the patient failed to complete the screening. The time it took to determine if it was a provider or patient issue equated to inefficient use of time and less

patients contacts. It was a lengthy process to determine why patients were not meeting the outcome measure for CRC screening. By implementing tracking of CRC screening orders on the actual day of the patient's visit, FIT kit distribution, and FIT results in the EHR helped to streamline the outreach process by having accurate information and a targeted list of whom to contact.

Another barrier was the Wi-Fi in the clinic was not reliable, therefore it would have been difficult for patients to watch any streaming instructional FIT kit videos. The manufacturer instructional videos were downloaded from the Internet onto recordable DVDs for use in the portable DVD players.

The clinic management team had competing priorities and did not see the full value of making improvements in an area that had poor performance. However, CRC screening was a priority from the overall organizational management team. The lessons learned and gained from this quality improvement project can be used to make improvement with other quality indicators in the future. Lack of achieving organizational goals on a quality measure was not only a provider problem; it was a clinic problem as well. Learning how to work towards common goals such as improving patient outcomes and exceeding organizational goals was the focus and motivational factor in the organization supporting a quality improvement project that accomplished these goals. The support of the clinic staff that were directly working with the project implementation proved that simple changes resulted in big gains that were realized due to real time availability of CRC screening performance data. The clinic set a personal goal of achieving first place in the organization and achieved this goal consistently over a 2-week period. However, the lack of valuing this project by the clinic management team had some effect on implementation of the project.

***Facilitators***

The key organizational facilitators for this quality improvement project were the executive leadership, clinic providers, and clinic staff all the way down to the MAs with the exception of the clinic management team who had a vested interest in improving CRC screening completion rates. The quality improvement team had made multiple attempts to assist with improving the CRC screening process resulting in a few gains; however, the quality improvement team performed most of the work without much participation from the family medicine east campus clinic staff. By choosing interventions that required no financial investment and were simple and easy to carry out, the family medicine east campus clinic staff got on board with improving CRC screening rates.

The laboratory staff were agreeable to allowing the family medicine east campus clinic providers and staff to distribute FIT kits and provide patient education on the proper steps in collection of stool specimens. Having the family medicine east campus clinic staff distribute the FIT kits addressed the problem of patients reporting that they did not receive a kit from the laboratory, the laboratory was closed when the FIT was ordered, or the patient left without checking with laboratory to pick up the FIT kit.

The organization's desired to increase the percentage of patients meeting the CRC screening quality indicators as a FQHC also served as a facilitator for this project since pay for performance influences the amount of money that is reimbursed to the clinic. This quality improvement project was easy for clinic providers and staff to implement with little to no cost. This quality improvement project also created a blueprint for the other family medicine clinics to follow as they move toward to improving their performance with quality indicators. Most important was that CRC is preventable and 100% treatable, but only if the screening is

completed. The patients also were identified as facilitators since they responded to completing CRC screenings by returning FIT kits and exceeding organizational goals for this quality indicator.

### **Ethical Considerations**

There were no potential risks or burdens to the patients, staff, providers, or administrative team in implementing this quality improvement project. This quality improvement project used evidenced based practice guidelines to establish best practices in caring for patients. A human subjects research determination questionnaire was completed for this project and was submitted to the University of the Incarnate Word Institutional Review Board for review. The University of the Incarnate Word Institutional Review Board deemed that this project was not regulated research but rather a quality improvement project and therefore did not require any further review. The CRC screening process and proposed interventions were reviewed by the clinic mentor and the project advisor. It was determined there was no substantial risk in implementing established clinical practice guidelines. The goal of this quality improvement project was to decrease the morbidity and mortality from CRC by implementing early screening and appropriate referrals for patients who tested positive for the FIT. The outcomes of this quality improvement project may not be generalizable beyond the healthcare organization in which the project was implemented. However, findings from this quality improvement project provide guidance to other providers in improving CRC screening rates.

Data confidentiality was maintained and the family medicine east campus clinic tracking sheet with CRC screening data was kept in a combination locked room within the provider's folder and was only accessed by those involved with the quality improvement project. The completed family medicine east campus clinic tracking sheet with CRC screening data was

placed in the designated container for shredding of documents containing patients' personal identifiable information as designated by the organization at the end of the data analysis phase.

### **Results**

Baseline patient demographic data from September 1-30, 2019, revealed 200 patients who met the criteria for CRC screening according to the USPSTF and HRSA clinical guidelines. These patients ranged in age from 50-74 years with a mean of 57.7 years. Sixty percent of these patients were female and 40% were male. The majority of these patients (57%) were of Hispanic origin. The rest of the patients were Black, non-Hispanic (27%) and White, non-Hispanic (8%). The remaining 8% patients were from varied racial and ethnic backgrounds. A majority of the patients seen at the family medicine east campus clinic were uninsured (52%) while the remaining insured (48%) were primarily using Medicare and Medicaid. Table 3 provides a summary of the patient demographics collected during this pre-intervention assessment as well as findings from the post-intervention evaluation.

Pre-intervention assessment data revealed that 54% of eligible patients did not receive an order for CRC screening. Forty-six percent of eligible patients received an order for CRC screening on the day of their clinic visit or within 1 year of the day of their clinic visit (laboratory orders and referrals are only valid if <1 year). Of the 46% of patients that received an order for CRC screening, 93.5% received an order for a FIT. The EHR revealed that only 25.6% of the patients that received an order for FIT had results documented in the EHR. Of these 25.6% of patients that had results documented in the EHR, 19.8% had negative FIT results and 5.8% had positive FIT results. Further evaluation of the EHR revealed that 20% of those patients with a documented positive FIT received a GI referral. The vast majority of these patients (80%) waited 25 days or longer to receive communication from the family medicine east campus clinic

of the positive FIT result and the order for a GI referral. The average wait time to receive communication of the positive FIT result and a GI referral was 95.2 days. Table 4 provides a summary of these findings collected during the pre-intervention assessment as well as findings from the post-intervention evaluation.

**Table 3***CRC Screening Characteristics Pre and Post Intervention*

Characteristic	Pre-Intervention ( <i>n</i> =200)	Post-Intervention ( <i>n</i> =337)
	09/01/2019-09/30/2019	02/11/2020-04/20/220
Age, mean, no. (in years)	– 57.68	– 57.67
Sex, no. (%)		
Male	– 40.0	– 36.5
Female	– 60.0	– 63.5
Race/ethnicity, no. (%)		
Hispanic	– 57.0	– 60.2
White, non-Hispanic	– 8.0	– 4.7
Black, non-Hispanic	– 27.0	– 23.1
Insurance coverage, no.(%)		
Yes	– 48.0	– 47.8
No	– 52.0	– 52.2

Post-intervention demographic data from February 11, 2020 to April 20, 2020, revealed 360 patients who met the criteria for CRC screening according to the USPSTF and HRSA clinical guidelines. Out of these 360 patients, 23 patients were excluded. The reasons for excluding 23 of these patients were that six patients refused CRC screening, three patients were identified as eligible in error as a valid FIT result was in the EHR, and 14 patients had evidence of a colonoscopy that was either scanned into the EHR or the colonoscopy report was requested and received during the implementation phase. The remaining 337 patients were used to evaluate the interventions. These patients ranged in age from 50-75 years with a mean of 57.7 years.

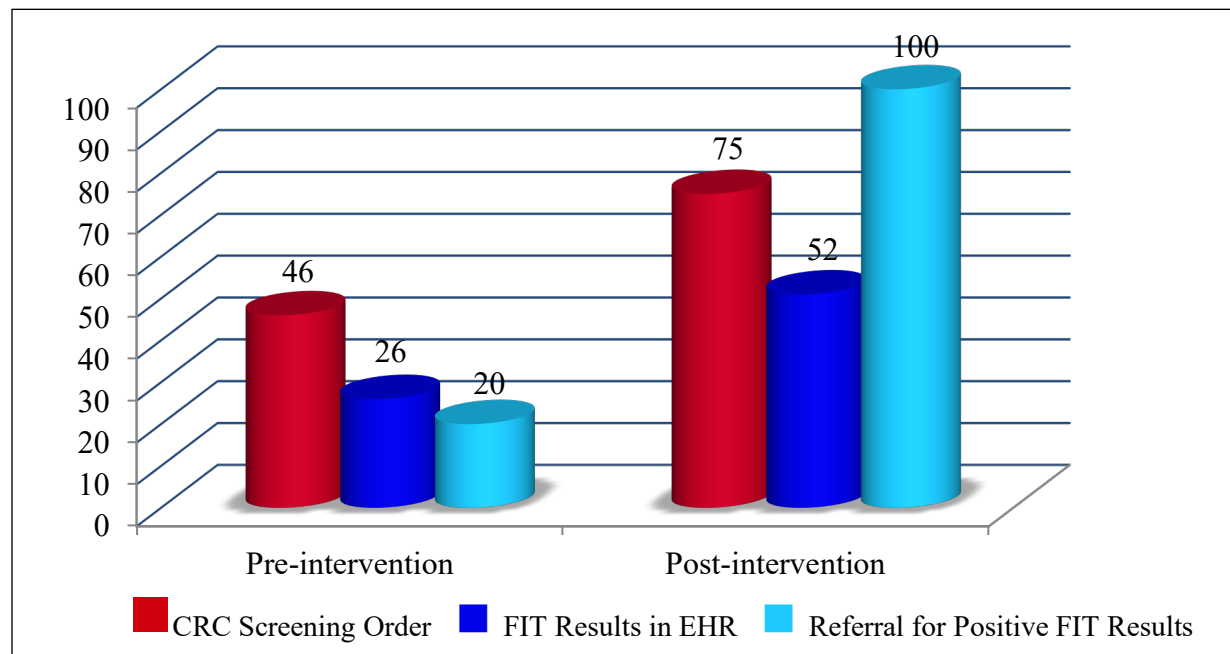
**Table 4***CRC Screening Objectives Pre and Post Intervention*

Objective	Pre-Intervention (n=200)	Post-Intervention (n=337)
	09/01/2019-09/30/2019	02/11/2020-04/20/2020
CRC Screening Order on Day of Visit, no. (%)		
Yes	– 46.0	– 75.4
No	– 54.0	– 24.6
FIT Distribution, no. (%)		
Yes	– Unknown	– 96.8
No	– Unknown	– 4.2
FIT Results in EHR, no. (%)		
Total	– 25.6	– 52.22
Negative	– 19.8	– 47.22
Positive	– 5.8	– 5.0
FIT Positive Result Notification with Referral, no. (%)		
< 2 weeks of posted result	– 20.0	– 100.0
≥ 2 weeks of posted result	– 80.0	– 0.0

Of these patients, 63.5% were female and 36.5% were male. The majority of the post intervention patients (60.2%) were of Hispanic origin. The rest of the post intervention patients were Black, non-Hispanic (23.1%) and White, non-Hispanic (4.7%). The remaining 12% of post interventions patients eligible for CRC screening were from varied racial and ethnic backgrounds. A majority of the patients seen at the family medicine east campus clinic were uninsured (52.2%) while the remaining insured (47.8%) were primarily using Medicare and Medicaid. Table 3 provides a summary of the patient demographics collected during the pre-intervention assessment as well as findings from this post-intervention evaluation.



Post-intervention assessment data revealed that 24.63% of eligible patients did not receive an order for CRC screening. Out of the 337 patients eligible for CRC screening, 75.37% received an order for CRC screening on the day of their clinic visit. Of the 75.37% of patients that received an order for CRC screening, 70.87% received an order for a FIT. The EHR revealed that 52.22% of the patients that received an order for FIT had results documented in the EHR. Out these 52.22% of patients that had results documented in the EHR, 47.22% had negative FIT results and 5% had positive FIT results. Further evaluation of the EHR revealed that 100% of those patients with a documented positive FIT received a GI referral within 2 weeks of the results being entered into EHR. The longest period of time that a patient had to wait for results was 11 days with an average wait time of 5.2 days to receive communication from the family medicine east campus clinic of the positive FIT result and the order for a GI referral. Table 4 provides a summary of the findings collected during the pre-intervention assessment as well as findings from this post-intervention evaluation. Figure 4 provides a percentage comparison between pre-intervention and post-intervention rates the project objectives. Objective 1 and objective 2 were not met, although it should be noted that there was a 63% increase in the percentage of orders being entered for CRC screening on the day of patient visits to the clinic and a 104% increase in the percentage of FIT results present in the EHR within 90 days of patient visit. Objective 3 was met with 100% of patients with positive FIT results having documentation in the EHR of receiving a GI referral. There was also a significant drop in the amount of time it took to notify patients of positive results and issuance of a GI referral from an average of 95.2 days to 5.2 days with 11 days as the longest period of time.

**Figure 4***CRC Screening Percentage Change for Project Objectives*

### Unintended Consequences

There were many unintended consequences associated with this project both positive and negative. As the project began, I discovered that the providers and staff were strongly focused on the FIT test, which is but one of the available screening tests for CRC. This was particularly important for patients who were insured as insurance coverage considers colonoscopies diagnostic in nature for patients with positive FIT results compared to being classified as screening colonoscopy if used as the initial screening method for CRC. Diagnostic colonoscopies usually result in out of pocket costs for patients whereas screening colonoscopies usually have no out of pocket cost. Unfortunately, there were three patients in the month of March whose FIT results were positive and two out of these three patients were insured. I met with the staff and providers at the end of March to encourage the staff and providers to review the patients'

insurance coverage to determine if a colonoscopy should be offered for those who are insured in order to avoid out of pocket expenses for the patients. If insured patients opted for FIT, then providers and staff were encouraged to inform patients that there might be an out of pocket expense associated with follow up colonoscopies if FIT results are positive so that the patient can make an informed decision.

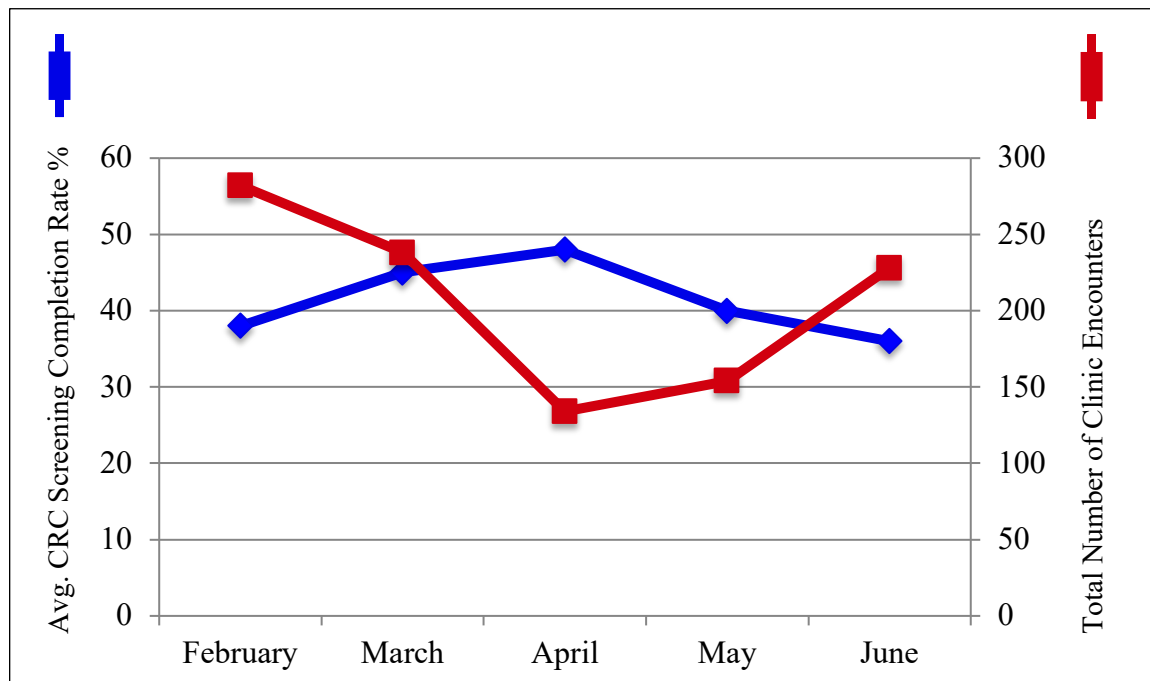
With the family medicine east campus clinic focusing on the CRC screening quality measure, it was communicated by administration that the providers were neglecting other quality measures that were of equal importance. Both providers and staff were encouraged to use the daily briefs to identify and address patients' needs related to all quality measures. The MAs were informed that a dashboard would be created to track performance for all quality care measures. It was also agreed upon that the MAs in addition to the providers would be held equally responsible for ensuring that standing protocols were carried out as a part of the patient care process.

Another unexpected consequence of this quality improvement project was the family medicine east campus clinic's ability to achieve the top performing family medicine clinic in the organization for 2 consecutive weeks for CRC screenings. This was a pleasant surprise and the clinic took joy in celebrating this welcomed accomplishment. The clinic designed a CRC screening t-shirt in support of CRC awareness month that helped build morale in the clinic which carried over into a notable performance despite the cancellation of the CRC awareness activities due to the coronavirus disease 2019 (COVID-19) pandemic. The staff were permitted to wear the t-shirts in the clinic even though the effects of the stay at home order in Bexar county was apparent with a decrease in patients seen at the family medicine east campus clinic.

The COVID-19 pandemic provided a unique opportunity to review processes and improve on areas needing attention. The use of telemedicine and curbside assessments changed the usual processes for the clinic. While reviewing the organization's monthly quality dashboard, the data showed an increase in the CRC screening completion rate despite a decrease in the number of clinic visits. April 2020 was the slowest month for the family medicine east campus clinic yet had the highest monthly CRC screening completion rate during the 5-month span (see Figure 5). Having the ability to spend an extra few minutes with patients may have accounted for this increase.

**Figure 5**

*2020 Average CRC Screening Completion Rate*



### Discussion

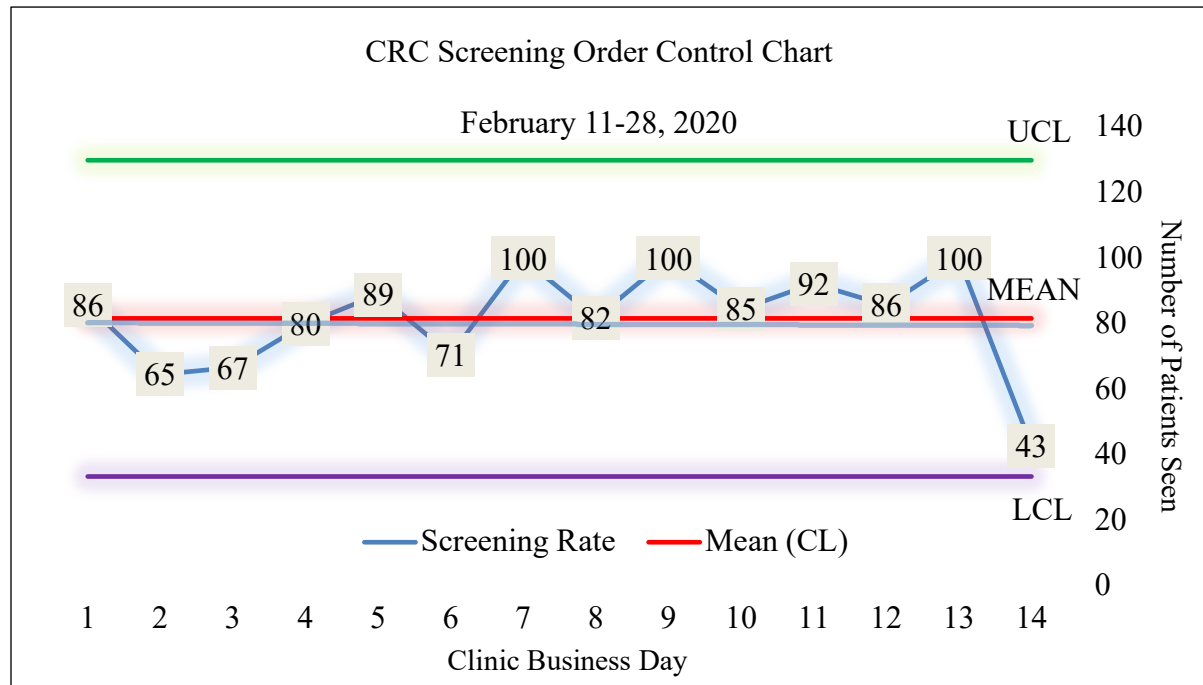
As previously mentioned, CRC is 100% treatable if detected early. CRC screening is essential in the early detection of CRC. An assessment of the family medicine east campus clinic revealed that the clinic was not following the USPSTF and HRSA clinical guidelines for CRC

screenings. The assessment revealed many processes that contributed to this problem. However, with any quality improvement process change it is important that those involved are willing to participate in the improvements. Supportive leadership is important and essential to launch a quality improvement initiative. The leaders must be able to visualize and understand the potential value of the quality improvement to the healthcare organization (Psek et al., 2015). Having a clear and concise approach to the quality improvement initiative and communicating this to the leadership and staff proved to be beneficial in demonstrating the value and benefits to patients, the clinic, and the organization (Psek et al., 2015). During my assessment of the family medicine east campus clinic it was evident that the providers and staff all recognized that their current performance was not meeting organizational goals or clinical practice guidelines. The providers and staff were willing to participate in improving CRC screening rates as long as the interventions did not significantly interfere with their ability to see patients in the clinic. This was an essential consideration due to the time allotted for appointments. The briefing and orientation sessions provided to the providers, staff, and administration helped created an environment of readiness by ensuring that everyone was on the same page regarding the quality improvement project.

During the first 2 weeks of the quality improvement project, the family medicine east campus clinic providers and staff showed a lot of motivation to move from the bottom of the organization for CRC screening completion rates by ensuring that approximately 81.71% of all patients seen received an order for CRC screening (see Figure 6). Approximately 67.14% of eligible patients opted and received an order for FIT screening with about 97.87% receiving the FIT kit from the clinic staff during their current clinic visit. Of the 94 patients who received an order for FIT screening during the first 2 weeks, 55.32% had a result in the EHR within 4 weeks.

**Figure 6**

*CRC Screening Order Process Control Chart*



### Tracking Data

A significant challenge with any quality improvement project is determining what information to collect and how to collect that information. The organization tracked quality improvement performance on CRC screening via a quality performance dashboard. The quality performance dashboard provided a screening rate based on the percentage of patients, 50 through 75 years of age, whom had the appropriate CRC screening out of the total who were eligible for screening (HRSA, 2018b). The dashboard did not indicate if the provider failed to order the screening or if the patient failed to complete the screening.

The data that I collected as opposed to what the quality performance dashboard collected proved to be much more meaningful. I collected datapoints involving date of visit, age at visit, type of CRC screening ordered, date of live phone communication, date of FIT result, date of

notification for positive FIT, date of disposition/referral for positive FIT, and provider type. This made the data more accessible and provided more insight as to the root cause of incomplete CRC screenings, i.e. was it a provider or patient-based process failure. The CRC screening order rates were based only on the total number of eligible patients seen and the total who received an order for CRC screening. The CRC screening order rate provided valuable information to the providers and clinic staff as to their compliance with ensuring that patients received appropriate CRC preventive screening during their clinic visits. The CRC FIT completion rates were based on the number of patients who received an order for a FIT compared to the number who completed the FIT screening. This information assisted the population health manager in streamlining targeted outreach activities to those who did not have a FIT result in the EHR 2 weeks after receiving a FIT order. The data spreadsheet also provided a centralized location where providers and staff could see who had a positive FIT result in order to ensure appropriate tracking of follow up dispositions for GI referrals and diagnostic colonoscopy.

### **Patient Responsibility in CRC Screening**

Providers are often evaluated based on performance of quality measures; however, with CRC screenings, patients have a responsibility to complete and return specimens to the clinic for processing in order for the intervention to be considered completed. This quality improvement project provided detailed data on how providers were doing as far as recommending and ordering the required CRC screening tests. Analysis of the data I collected and the data provided by the organization's performance-based dashboard helped to identify how providers, staff, and patients contributed to CRC screening completion rates. This quality improvement project also provided additional insight on the benefits and effectiveness of live phone communication with those who did not return a completed a FIT kit within 2 weeks of the office visit.

In an effort to ensure as much patient compliance as possible, this quality improvement project incorporated many strategies identified in the literature as helping to improve CRC screening rates. All of the rooms in the family medicine east campus clinic were stocked with pre-made FIT kits. The original FIT kits provided by the manufacturer contained a set of instructions for use, a test card for specimen collection, a brush kit with two waste bags, and a return envelope. As part of this quality improvement project, several additional items were added to the kit based on patient needs identified in the literature. Gordon and Green (2015) found that approximately 50% of FIT kit users suggested adding a disposable glove to FIT kits to assist with decreasing feelings of discomfort and disgust when collecting stool specimens. Gordon and Green (2015) also identified that many patients felt embarrassed about collecting and returning stool specimens for CRC screening. Initially, a single disposable glove was added to the kit to assist in preventing contact of the stool specimen with patients' hands. Once the quality improvement project was underway, it was decided that a discrete bag should be added to the FIT kit for transport of the completed FIT kit to the laboratory to decrease embarrassment. The clinic manager ordered discrete plastic bags approximately 1 month into the project implementation.

Effective specimen collection is dependent on patients' understanding of instructions on specimen collection. The family medicine east campus clinic serves a lower socioeconomic population with a large population of Spanish speaking patients. Coronado et al. (2014) found that FIT kit instructions that were brief, easy to read, contained picture representation of specimen collection, and were available in both English and Spanish helped improve FIT completion rates. I created a four-step direction sheet in English and Spanish for insertion in the FIT kits. I had a bilingual staff member review the instructions and make any necessary



corrections. Additionally, a 5-minute video that was available in English and Spanish was provided for patients to review prior to leaving the clinic with their FIT kits. It was interesting to note that none of the patients contacted the clinic with questions about the stool specimen collections and all of the completed FIT specimens that were returned to the laboratory were acceptable specimens as indicated by patient results in the EHR.

In order to ensure that patients had as many options as possible to return the stool specimens for processing, areas were highlighted on the information sheet that indicated what information was required for completion of the FIT and where they could return the specimens. Patients could return specimens to the family medicine east campus clinic, any clinic laboratory associated with the organization, or any location of the contracted laboratory outside of the clinic organization.

All of these interventions helped to decrease the patient's time at the clinic and ensure that the patients had all of the information they needed to complete the FIT kits. The providers and staff were able to confirm receipt of a FIT kit and answer any questions. This also helped to free up the laboratory staff from conducting the patient teaching about the FIT kits in between servicing other laboratory customers. These interventions decreased the amount of time patients spent at the clinic to obtain FIT kits and receive instructions on specimen collections to 5 minutes.

These interventions resulted in an increase in patients returning completed FIT kits from 25.6% to 52.22% during the implementation period. Although this did not meet the project objective of obtaining 75% of patients that had a FIT result in the EHR, it was a doubling of completed returned FIT kits. Coronado et al. (2017) compared the effectiveness of various reminders strategies (automated versus live) for a FIT program. They found that only 10% of the

patients returned their FIT within 3 weeks of receiving the kit. It was interesting to note that of the patients that returned the FIT kit, 26.67% of these patients returned the completed FIT kit in 2 weeks or less from the time of their clinic visit, which is higher than most rates reported in the literature.

I had the family medicine east campus clinic track patients receiving FIT kits to identify those patients who did not return their completed FIT kits within 2 weeks. There were 147 patients entered into the database at the end of February 2020 with only 24 patient results in the EHR within 2 weeks or less of receiving the FIT kit. It became apparent that as the number of patients receiving FIT kits continued to grow, it was not feasible to expect staff to identify who would contact the patients via live phone communication if FIT test results were still pending after 2 weeks. After much discussion with the family medicine east campus clinic personnel, the population health manager, who is bilingual in Spanish and English, and I agreed to make a revision to the project by centralizing the live phone communication outreach. This one point of contact would be more efficient and easier to track. The population health manager agreed to take ownership of this intervention. This also allowed the population health manager to address other quality care measures with the patient simultaneously once the patients were on the phone. This also allowed for greater interaction between the MAs and clinic management. The population health manager made 224 calls and was able to achieve approximately 88% contact with those who received an order for CRC screening but had not completed the FIT kit within 2 weeks. This resulted in an additional 23.89% of patients returning their FIT kits. Coronado et al. (2017) found that an additional 25.5% returned completed FIT kits after live reminders were delivered (live phone call, text, email, or automated phone call). The conclusion was that patients who received live phone calls had 50% greater odds of completing the FIT kit when compared to

those who receive an email or text message with a lower threshold of 21% and 34% respectively (Coronado et al., 2017).

### **Clinic Considerations**

Initially, this quality improvement project involved changing the tracking of FIT orders/FIT kit distribution from a paper documentation process to an EHR documentation process while using the daily brief quality measures sheet. The paper clinical tracking sheet was useful during the first 2 weeks of the project's implementation to assist with transitioning to the new process. However, during my observations of the clinic staff during the first 2 weeks, I saw that they were distributing the FIT kits and placing the order for a FIT test with less need for prompting. I decided on March 03, 2020 that due to the difficulty in keeping track of all the hardcopies of the clinical tracking sheets as well as a need to reduce the use of paper that the EHR comments section on the appointment screen would be used for tracking information along with the prompts provided by the printed daily brief that the MAs and providers printed every morning.

Selby et al. (2019) focused on the timeliness of colonoscopy follow-up within 30 days after receiving a positive FIT result and utilized a registry for tracking participants. Results showed that 79% of these patients obtained a follow up colonoscopy after a positive FIT within 180 days. This quality improvement project had a guideline of notifying patients of positive FIT results and ordering a GI referral within 2 weeks of receiving a positive FIT result so that the patient could see the gastroenterologist and schedule a colonoscopy in a timely manner. Almost 10% of the patients had positive FIT results and 100% of those patients received notification of the positive results and referrals for a diagnostic colonoscopy with an average notification time of 5.2 days. This was a significant drop from the average of 95.2 days pre-intervention.

However, it should be noted that due to the COVID-19 pandemic, most healthcare providers were not performing procedures considered non-emergent. Many of the gastroenterologist offices and endoscopy centers were closed during the latter part of this project's implementation due to the COVID-19 pandemic.

Two days prior to transferring this project over to the clinic, my clinic mentor approached me about exploring the possibility of adding an electronic flag to display upon opening the EHR. Due to the COVID-19 pandemic, many of the in person clinic visits were transferred to a telemedicine format in which the responsibility was solely on the provider to ensure the quality measures were being addressed. Telemedicine removes the MAs from the process thus preventing the MAs from entering orders for CRC screenings. It then became the responsibility of the providers to enter the order for FIT testing. After working for a few hours on one patient's EHR who was recently seen via telehealth, my clinical mentor and I were able to devise a more efficient way of alerting anyone who may access the EHR that patients are due for a CRC screening. The electronic red flag opens upon starting an encounter in the EHR and must either be acknowledged or dismissed to access the EHR. This change was initiated on April 17, 2020 for patients scheduled to be seen on Monday, April 20, 2020. I informed both providers and clinic staff about the change and how the alert would appear. The alert clearly stated, "CRC screening due." The clinic mentor praised the new intervention and commented that it was a big visual reminder that was very helpful after using it on April 20, 2020. I emailed the new process to the population health manager who also agreed that it would be helpful in alerting the healthcare team. The population health manager acknowledged that this process might be useful for the other quality measures that needed to be done routinely.

The daily chart audits continued throughout the implementation of the quality improvement project and information was shared with the staff in real-time when available. This information was pivotal in providing moral support and advice to the clinic providers and staff. It was important that I was available to the clinic providers and staff to answer questions, clarify information, or explain more about this quality improvement project. This quality improvement project had a minimal cost of \$120 to implement and increased patient time at the clinic by 5 minutes without delaying the amount of time providers spent with the patients. The Microsoft Access database that was given to the population health manager will be an asset in helping to ensure that annual CRC screenings are completed, particularly once the COVID-19 pandemic is controlled. Robertson et al. (2017) identified the key quality metrics that should be used to determine the effectiveness of a FIT program which include FIT completion rate to those offered testing, the number of patients returning unacceptable specimens that went beyond the return time as determined by manufacturer guidelines, and colonoscopy follow up rates for those patients with a positive FIT. With a substantial increase in FIT orders, FIT results in the EHR, and referrals for GI consults for those patients with positive results, the family medicine east campus clinic has improved its identification of patients at risk for CRC.

### **Limitations**

The COVID-19 pandemic potentially impacted the CRC screening completion rates for the FQHC family medicine east campus clinic. Face-to-face appointments were cancelled starting on March 19, 2020 with telemedicine being instituted as a replacement. The original project design was based on patients coming for routine face-to-face clinic visits. Adjustments were made as feasible once telemedicine appointments were instituted. CRC screening rates may have been higher if social distancing precautions had not needed to be implemented. The

COVID-19 pandemic has demonstrated the need to consider how to ensure sustainability of this type of project to include telemedicine visits. While this quality improvement project may be applicable to other quality measures, it cannot be assumed that is generalizable to other quality measures, differing specialties, or different patient demographics.

### **Recommendations**

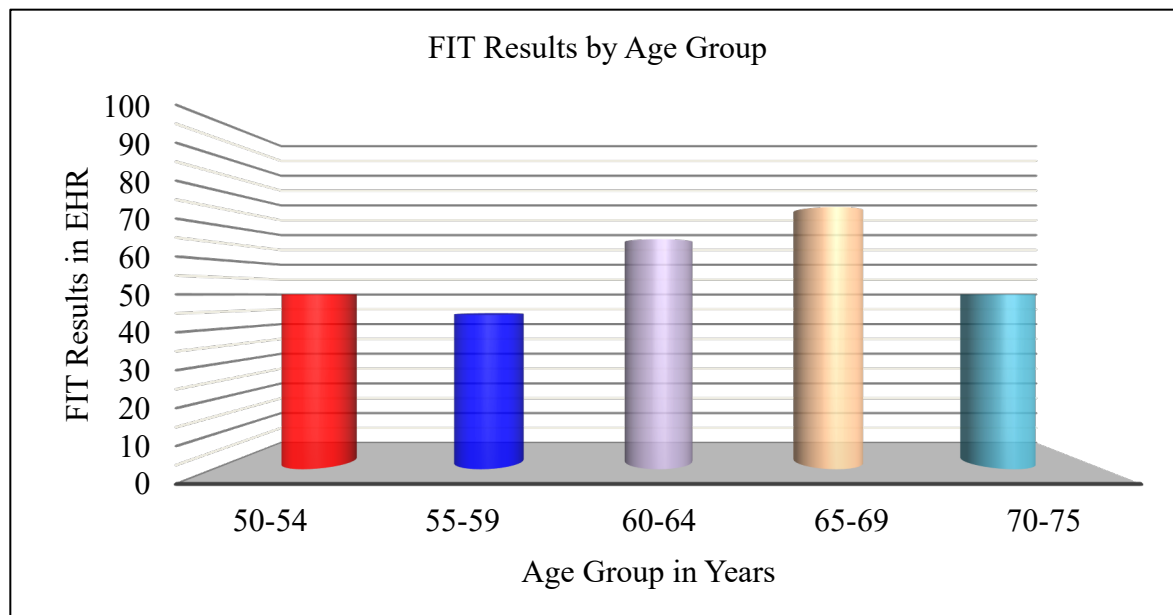
From the beginning, this quality improvement project has included a goal for the project to be sustainable. Despite the changes that had to be implemented in how patient care was delivered related to COVID-19, the family medicine east campus clinic allowed me to offer input on how CRC screenings could be accomplished using drive up curbside services. After meeting with the assistant clinical manager, it was decided that having portable DVD players available for the patients to watch the FIT kit instructional videos while sitting in their vehicles was a viable option to continue the project. Ordering of the FIT test had to be designated to the providers since the MAs no longer check the patients into the office. Patient CRC information, kit distribution, and the ordering of the tests would remain the same as a traditional office visit. However, when patients returned to the clinic, a drop off container was established to allow them to deposit their completed FIT kits. Despite these changes due to the COVID-19 pandemic, the clinic and I were able to make necessary modifications to the interventions and analysis compliance with the project interventions to ensure that quality of care continued to be offered to the patients based on established clinic guidelines regardless of the type of clinic visit whether telemedicine, curbside, or in-person visits.

I recommend looking at patients who are 50-59 years of age as this age group traditional has a lower CRC screening rate compared to patients 60-75 years of age, which places them at an increased risk of colon cancer (Joseph et al., 2020). Providing CRC screening information to

patients who are 49 years old during their clinic visit may be an effective strategy in helping patients to advocate for CRC screening once they turn 50. It also provides the patient an opportunity to consider which CRC screening method they would prefer to complete. This is consistent with Joseph et al. (2020) who noted that providing preventive education about CRC prior to the patient reaching the age of 50 can be of benefit once the patient and help ensure prompt completion of CRC screening once eligible for testing. CRC screening completion rates among those 50-54 years of age was the lowest with those 50-64 years of age having a lower CRC screening rate as compared to those who are 65-75 years of age as reported in the 2018 Behavioral Risk Factor Surveillance System survey (Joseph et al., 2020). This was consistent with CRC screening completion rates at the family medicine east campus clinic (see Figure 7).

**Figure 7**

*FIT Results in EHR by Age Group*



### **Implications for Practice**

Using an opportunistic approach with real time distribution of FIT kits during office visits positively impacts CRC screening completion rates. There was an increase in the number of actual FITs completed, an increase in the number of results documented in the EHR, and an increase in the timeliness of referrals for positive FIT results, which may lead to earlier identification of CRC and initiation of appropriate treatment. Increased CRC screening completion rates resulted in the FQHC family medicine east campus clinic meeting HRSA goals and improved reimbursement to the organization that may improve the availability of other resources to the patients. This quality improvement project helped improve the number of patients screened for CRC that ensures a healthier community, helps to keep healthcare costs controlled, and reduces morbidity and mortality rates associated with CRC. Finding low cost, easy prevention interventions help to improve screening rates for cancer, diabetes, heart disease, and other conditions. Screening guidelines need to be individualized for specific conditions. It may also help providers recognize the importance of screening for these types of conditions even when constrained by tight appointment times. Having the healthcare team working together ensures that no one team members is overburdened.

### **Relevance to DNP Prepared Nurse Practitioner**

As doctor of nursing practice (DNP) prepared nurse practitioners, understanding how to conduct, implement, and evaluate a quality improvement project based on current evidence will prove to be valuable to patients, patients' families, one's own practice, one's own organization, one's own community, and to professional organizations. The DNP prepared nurse practitioner as a responsibility to be able to translate research and use the best available evidence to improve the quality of nursing practice by critically analyzing evidence and data to address issues



effecting patient care (American Association of Colleges of Nursing, 2006; Thomas, et al., 2012). This often times requires questioning traditional practices in the clinical setting as new evidence emerges. For instance, the traditional method of obtaining a fecal specimen for CRC screening using the digital rectal approach during an office visit examination is outdated and not supported by the current evidence. A quality improvement project such as this in which preventive CRC screening methods that are supported by current clinical practice guidelines (USPSTF) can serve as a gateway to implement other quality improvement projects that may be needed in one's place of work. Practice and the generation of new knowledge are not static. There is always something to improve upon in one's own practice especially when it results in improved patient outcomes. Today's patients are well informed and inquisitive about their health because they do their own research. Therefore, DNP prepared nurse practitioners must remain knowledgeable, current, prepared and equipped to serve as a change agent within practice when the evidence supports change. This helps to ensure that the DNP prepared nurse practitioner is building trust with colleagues, patients, families, and the community know that they are working to improve the health of those who have entrusted them with their health.

### **Conclusion**

This quality improvement project contributed to the evidence that cost effective, basic interventions can have a significant impact on changing providers' behaviors. The family medicine east campus clinic fully supported the project and was eager to take the lessons learned and apply them to other quality measures as well as within other clinics. The noticeable performance improvement of the family medicine east campus clinic in CRC screenings has brought a sense of pride and renewed interest in providing the best care possible even during these historical and unprecedented times. The clinic achieved their goals, as have I. While only

one of the project objectives was met, there was a substantial increase in the performance of the other objectives that merits continued implementation of the project interventions. These basic and simple modifications resulted in improved care for the patients seen at the clinic.

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## Appendix A

### Letter of Support

#### Letter of Support

November 25, 2019

University of the Incarnate Word  
4301 Broadway Street  
San Antonio, Texas 78209

RE: Performance Improvement Project Letter of Support for Leslie M. DuBois

Dear University of the Incarnate Word Chair, Faculty and Members:

I am writing this letter of support for Leslie M. DuBois. It is our intention to support Leslie M. DuBois' performance improvement project (described below).

#### Performance Improvement Project Overview

##### **1. Project Purpose:**


The purpose of this performance improvement project is to increase the proportion of all adult patients in a federally qualified health center Family Medicine clinic, 50-75 years of age, who complete colorectal cancer screening.

##### **2. Background & Rationale:**

Colorectal cancer is 100% preventable with the appropriate screening in the primary care arena. The impact will improve patient outcomes by preventing and decreasing disability and mortality from colorectal cancer.

Sincerely, 

Joaquin Littlejohn, FNP-C  
DNP Project Mentor  
CommuniCare Health Centers, East Campus

For:   
Manuel Salazar  
Practice Manager  
CommuniCare Health Centers, East Campus

## Appendix B

## Evidentiary Table for Summary of Evidence

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
U.S. Preventive Services Task Force (2016)	Purpose: Establishes clinical practice guidelines	Design: N/A, Clinical Practice Guideline  Sample/Setting: N/A	Findings: The US Preventive Services Task Force (2016) suggests screening for CRC beginning at age 50 and proceeding until 75 years of age. The USPSTF determined with high confidence that screening for colorectal malignant growth in average-risk adults from 50 to 75 years of age, without symptoms, is of significant net advantage. Screening for CRC is a significantly underused preventive wellbeing service in the U.S.  Implications: The USPSTF suggests screening for CRC beginning at age 50 years and proceeding until 75 years of age (A recommendation). Proposals for average-risk adults from the USPSTF incorporate either colonoscopy at regular intervals (every 10 years), CTC at regular intervals (every 5 years), or a stool-based test (every 1 to 3 years), contingent upon the susceptibility of the stool-based test.	I	A
Lin et al. (2016)	Purpose: To provide a synthesis of the evidence to the USPSTF on updating the guidelines CRC screening	Design: Systematic review consisted of an evaluation of a variety of randomized control trials, prospective cohort studies, nested case-control studies and observational studies  Sample/Setting: 8,492 abstracts, 696 articles and additional 33 studies from a prior review. The article reviewed average risks or unknown risk factors for people aged 40 years or older with no symptoms.	Findings: The results indicate that any screening (flexible sigmoidoscopy (FS) [11-12 years], guaiac-based FOBT [11-30 years], and colonoscopy) was beneficial in reducing the incidence and mortality of CRC versus no screening at all. Any screening was beneficial in reducing the incidence and mortality of CRC versus no screening at all. With colonoscopy, adenomas 10 mm or larger have a detection rate of 89.1%-94.7% and adenomas 6 mm or larger have a detection rate of 74.6%-92.8%. With colonography, adenomas 10 mm or larger are detected 66.7%-93.5% of the time, and adenomas 6 mm or larger are detected 72.7%-98.0% of the time. The stool-based test identified as the FIT has a higher specificity of 73.3%-95.5% and lower sensitivity of 73.8%-78.6%. The risk of having a colonoscopy notably consists of perforation and bleeding. The notable risks of having a CTC are radiation exposure and the chance that you may have to have a follow up procedure to remove a polyp that was found.  Implications: More details are available about the effectiveness of the following tests: FS and FIT plus stool. Thus providing, evidence-	I	A

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
			based recommendations and guidelines for CRC screening intervention should also consider the risks and benefits associated with these screening procedures.		
Rex et al. (2017)	Purpose: Establishes consensus guideline for systematic approach to recommending testing	Design: Qualitative approach using an informal meta-analysis  Sample/Setting: N/A	Findings: The MSTF on CRC recommended that a colonoscopy is suggested first. If the patient declines a colonoscopy, then the primary care provider should recommend a stool-based test such as a FIT. The MSTF (2017) considers a colonoscopy and a FIT as tier-one testing and encouraged the opportunistic approach when offering sequential screening. There are nine options available for CRC screening. The MSTF recommended that when a patient is only offered “two” screening options, it is highly likely that the patient will follow through and complete the screening.  Implications: The MSTF took the stance that the best test is the test that is completed.	V	A
Gupta et al. (2016)	Purpose: To decide if offering small budgetary motivating forces would increase CRC screening rates in a low-pay, uninsured populace	Design: Randomized, comparative effectiveness trial  Sample/Setting: 8,565 participants considered to be low-income and uninsured	Findings: FIT completion rates among the uninsured was 36.9% with the financial incentive as compared to 36.2% without the financial incentive. Financial incentives of \$5 or \$10 had no impact on completion of CRC screenings.  Implications: Offering a financial incentive as a motivator to complete FIT screening does not impact CRC screening rates regardless of the amount.	II	A-B
Ishida et al. (2019)	Purpose: To improve the CRC screening ordering process to ensure that more patients who are eligible for screening receive orders initiated in the clinic by medical staff (providers and/or unlicensed assistive personnel and automated telephone outreach calls)	Design: Quality improvement project  Sample/Setting: 100 eligible and unscreened patients in a urban FQHC, during an 8 week period; 40 patients received outreach calls from care coordinators; 40 patients received automated telephone call reminders to call a care coordinator to obtain an order for CRC screening; 20 patients were offered CRC screening by a MA as a part of their scheduled office visits	Findings: A total of 100 patients received one of the interventions. Ten patients received an order for either colonoscopy or FIT by the conclusion of the second PDSA cycle. The MA-offered screening resulted in the highest percentage of patients accepting CRC screenings and patients preferred this outreach approach compared with care coordinator outreach or automated voice messages. Care coordinator outreach yielded a lower rate of accepted screenings. None of the patients who received the automated calls followed up to obtain a screening order.  Implications: Unlicensed assistive personnel have the potential to increase patient access to CRC screening. CRC screening has long been exclusively the purview of individual providers. By expanding unlicensed assistive personnel	VI	B

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
			participation in CRC screening campaigns, the ability to make a significant impact on the health of the communities should be the focus.		
Coronado et al. (2014)	Purpose: To develop FIT kit directions that were easy to read and understand by a diverse population using the least amount of words in hopes to increase CRCS rates	Design: The study was qualitative in nature and utilized Spanish speaking patient advisory council members [patients and family members] which was the focus group, and feedback from clinic personnel and stakeholder advisory board members (clinic representatives, policy makers, patient advocates, and others) to evaluate the FIT kit directions.  Sample/Setting: The sample consisted of 10 Hispanic patients (9 females/1 male) who were Spanish speaking between 27-56 years of age, four clinic personnel, and 16 members from the advisory board. The setting was a FQHC in Portland, Oregon in which 15% of the primary care services are utilized by 50-75-year-old adults whom were Hispanic (41%). Spanish was the preferred language (44%) for this population and 44% of this population were uninsured.	Findings: All patients, independent of whether they got the silent or bilingual worded guidelines, detailed being able to comprehend the directions and complete the test. In any case, all patients announced that they favored the silent guidelines over the bilingual directions. Patients did not have an eversion response to the realistic delineation of the fecal example, and some noted the significance of that picture in accentuating the limited quantity of fecal substance required for the test. Patients detailed that the silent directions likewise were less scary than the worded guidelines, which comforted the patients in finishing the test. All members indicated that they would prescribe CRC screening to their eligible acquaintances due to the simplicity of the test.  Implications: Giving easy to understand directions on how to complete a FIT kit may help to raise CRC screening rates among low-education and non-English-speaking populations. Such guidelines may be especially valuable for projects that regularly send FIT kits via postal services to patients' homes, where verbal, medically trained guidance is impractical. The understandability and availability of simple and bilingual instructions can positively impact CRC screening completion rates.	VII	B
Dougherty et al. (2018)	Purpose: To distinguish interventions related with expanding CRC screening rates and their impact	Design: Systematic review and meta-analysis of randomized clinical trials  Sample/Setting: 2123 abstracts, 104 full length studies, and 73 randomized clinical trials (366,766 average to moderate risk adults) examining 232 interventions in	Findings: Implementing individual interventions to increase CRC screening uptake showed that outreach (17-27%), patient navigation (13-23%), patient education (1-6%), patient reminders (0-5%), provider interventions (3-17%), and provider reminders (8-19%) each had a nominal effect on CRC screening completion. Furthermore, a combination of the beforementioned interventions (outreach and clinician intervention/navigation [3-11%] and repeated mailing of fecal blood tests	I	A



Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
		457,534 average risk adults.	with navigation [29-49%] were associated with an even higher increase.  Implications: Patient navigation and stool-based testing outreach each produced a significant increase in completion of CRC screenings while combining both of the interventions produced an even greater increase in CRC screenings.		
Reuland et al. (2017)	Purpose: To decide the consolidated impact of a CRC screening choice guide and patient outreach compared with usual care as it relates to CRC screening uptake	Design: Randomized clinical trial  Sample/Setting: Data collected between January 2014 to March 2016 in two community health centers that serves vulnerable populations. There was 265 average risk patients were 50-75 years of age, spoke English or Spanish, were eligible for CRC screening and seen regularly in the primary care clinic.	Findings: The population characteristics revealed a mean age of 58 years; 65% were female, 62% were Latino; 15% were white non-Latino; 23% were black or of mixed race; 78% had a household income of less than \$20,000; 38% had low literacy; 28% were on Medicaid; and 34% were uninsured. The participants who received had access to a decision aid (video) and patient navigation were most likely to complete CRC screening in a 6-month timeframe was 68% versus those who did not receive an intervention (27%). Of note, the intervention had a greater impact in women (50%) when compared to men (21%) as it related to CRC screening uptake.  Implications: A combination of a decision aid (video) and patient navigation proved to be responsible for an increase in CRC screening rates among those who are considered to be a vulnerable population.	II	A
Davis et al. (2018)	Purpose: To contrast the adequacy of interventions to improve fecal testing for CRC in the primary care clinical and community settings serving rural, low-pay populaces	Design: Systematic review  Sample/Setting: 4,218 citations were reviewed and 27 studies were chosen	Findings: After reviewing 4,218 citations, 27 studies were included in the systematic review. The review comprised 74.1% of the studies were implemented in primary care, 18.5% were conducted in the community, and 7.4% were conducted in both environments. Multicomponent interventions were apart of all the studies. As far as the studies conducted in the clinical environment, the interventions that were considered to be the most effective included mailing stool-based screening kits by mail, inclusion of a pre-paid envelope to encourage return of completed stool-based screening kits, patient reminders, and provider driven ordering of the stool-based screening with in-clinic distribution of the stool-based screening kits. The interventions that were delivered by the clinic staff had the greatest impact on CRC screening uptake.  Implications: Distribution of stool-based testing in clinic by providers	I	A-B

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
			and clinical staff, mailed stool-based testing kits program, inclusion of pre-postage paid envelopes to return completed kits, and patient reminders/calls were highly effective in increasing CRC screening rates. The impact of these interventions on CRC screening uptake can help stakeholders to determine if the mentioned interventions would be appropriate for use in their unique practices and communities to improve CRC screening completion rates.		
Cunningham et al. (2019)	Purpose: To decide the adequacy of simple multicomponent interventions on improving CRC screening rates	Design: Quality improvement pre-post intervention study  Sample/Setting: Patients who lived in rural Kansas, 50-75 years of age, who were eligible for CRC screening and seen in one of the two primary clinic locations from October 2018 to December 2018 and received either a postcard, electronic notification, or in office visit in reference to completing CRC screening.	Findings: The pre-intervention CRC screening rate was 61% and the post-intervention CRC screening rate was 66%. The monthly screening rates in the post-intervention phase revealed a CRC screening rate reaching as high as 70% which was higher than any monthly CRC screening rate in the pre-intervention phase. There was an increase of 5% after intervention implementation.  Implications: Identified effective and cost-efficient multicomponent interventions including educational postcards, electronic education, MA and registered nurse education, and provider ordered screening during in office visit at two different family care centers that resulted in an increase in CRC screening rates in an environment where revenue and resources are scarce.	VI	A
Coronado et al. (2018)	Purpose: To determine the effectiveness of the auto mailing of FIT kits based on information contained in the EHR as a part of standard of care in a FQHC	Design: The cluster randomized pragmatic clinical trial consisted of stratified allocation assignments made on February 04, 2014 by health center with 13 clinics receiving usual care and 13 clinics using the embedded outreach program (auto mailing of FIT kits).  Sample/Setting: From February 04, 2014 to February 03, 2015, 41,193 adults (50 to 74 years old) with an average age of 58 years, with 56% being women who was seen at one of the 26 federally qualified health clinics in Oregon or	Findings: The intervention clinics yielded results indicating that 13.9% completed a FIT and 18.3% completed any type of CRC screening as compared to the usual care clinics in which 10.4% completed a FIT and 14.5% completed any type of CRC screening. There was a huge gap of variation across the organization in viewing the effectiveness of the FIT program with FIT completion rates differing as much as 25 percentage points. The implementation of the FIT program also showed a noticeable widening in difference by as much as 61.7 percentage points.  Implications: A mail-based CRC screening outreach program can improve CRC screening rates with the FIT and other secondary screening interventions. The outreach program can have a positive impact on clinical workflows. However, additional strategies may be needed in the setting of health centers with a lack of resources who are considering	II	A

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
		California within the last 12 months whom was due for CRC screening. The CRC screening inclusion criteria consists of a) no stool based testing within the last 11 months, b) FS within in the last 4 years, or colonoscopy in the last 9 years, c) no pending orders for a stool based test in the last 6 months or a referral for endoscopy (FS or colonoscopy) in the last year. Exclusions were based off of a diagnosis of CRC, colon disease, end-stage renal failure. The intervention clinics contained a sample size of 21,134 and the usual care clinics contained 20,059 participants.	implementing a mail-based CRC screening program.		
Coronado et al. (2017)	Purpose: To compare the effectiveness various reminders (automated vs live strategies) for a direct-mail FIT program	Design: randomized control trial was stratified by clinic/non-randomized group (those who received email reminders via the patient portal)  Sample/Setting: 2,010 adults aged 50–74 (52.4% female and 47.6% male), with 24.2% Hispanic origin, 19.1% spoke Spanish, were not up to date with CRC screenings, and attended a clinic visit in the previous year, were mailed FIT kits. There were four primary care clinics from Sea Mar Community Health Centers in western Washington	Findings: A total of 255 (10%) participants returned their FIT within 3 weeks of the mailing. Among randomized participants, an additional 25.5% returned their FITs after reminders were delivered.  Implications: Compared to the non-randomized group allocated to receive a reminder letter, return rates were higher for the group assigned to receive the live phone call and lower for the group assigned to receive text messages.	II	A
Robertson et al. (2017)	Purpose: To compare how effective the FIT was with other secondary preventive tests for CRC in order to	Design: Systematic and meta-analysis review of randomized control trials, cohort, cross-sectional, and single comparative studies.	Findings: The FIT was determined to have an overall sensitivity of 79% and specificity of 94% for CRC. For advanced adenomas, the sensitivity of FIT varied from 6%-56%. The positive predictive value for a FIT to detect CRC varied from 2.9%-7.8%.	I	A

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
	provide recommendations from the United States MSTF on CRC	Sample/Setting: The sample size of the number of articles, abstracts, and studies reviewed was not indicated. The characteristic of the population used in the reviews indicated that they were asymptomatic adults whom were at average risk for CRC.	and to detect advanced adenomas, ranged from 33.9%-54%. Adherence was the key, whereas consistently completing the recurring annual single sample FIT test was superior when compared to the three-sample guaiac fecal occult blood test. A single sample annual FIT screening is appropriate. When the FIT is positive, a colonoscopy was the recommended test for evaluation. Diet or medications do not need to be adjusted in order to complete the FIT. The United States MSTF recommended that a stool that is spontaneously passed be used for the FIT test specimen collection as opposed to an office collected specimen via digital rectal examination. The recommendation was to adhere to manufacturer guidelines as it relates to storage and transport temperatures to minimize the effects on test performance and sample integrity and the prescribed return time upon collecting the specimen.  Implications: Like colonoscopy-based projects, FIT-based screening projects require attention to the quality process when ordering the test. These are the quality measures along with target goals that are recommended in order to consider the FIT screening program to be effective and efficient: a) the FIT completion rate to those offered testing should be $\geq 60\%$ , b) the number returning a FIT that cannot be processed for identified reasons (expired, return time in relation to collection date exceed manufacture guidelines should be $< 5\%$ and c) colonoscopy follow up rates for those with a positive FIT should be $\geq 80\%$ . The key quality metrics to measure in a FIT program was FIT completion rates of those offered the FIT, the number returning the specimens, but samples were unacceptable (beyond the return time as determined by manufacturer guidelines), and colonoscopy follow up rates for those with a positive FIT.		
Selby et al. (2019)	Purpose: To improve strategies for follow-up after a positive FIT as the effectiveness of the FIT depends on prompt colonoscopy investigation	Design: The mixed-methods study (quantitative/qualitative) consisted of an evaluation of a retrospective longitudinal cohort in which patients were studied during three different time	Findings: 126,420 patients (79%) had a follow up colonoscopy after a positive FIT within 180 days. 67% received a follow-up colonoscopy between 2006-2008. 79% received a follow-up colonoscopy between 2009 and 2012. 83% received a follow-up colonoscopy between 2013-2016.	IV	A-B

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
		<p>periods</p> <p>Sample/Setting: August 2006-August 2016; total of 160,051 participants who completed and received a positive result on the FIT test. The characteristics of the population: average age of 62-years-old, majority white, and male</p>	<p>Implications: The foundation of colorectal screening programs is an appropriate follow-up with a colonoscopy in a timely manner after receiving a positive FIT test result coupled with an electronic registry for tracking along with dedicated personnel (provider and ancillary staff) from the primary care provider to gastroenterology services whom have the ability to expand the capability of their service to accommodate an influx of colonoscopy referrals for a diagnostic colonoscopy after receiving a positive FIT result within 180 days. The current rates of colonoscopy follow up after a positive FIT result is 50% and evidence-based research notes that as the 180-day threshold is surpassed, the chances of CRC increases.</p>		
Gonzalez et al. (2017)	<p>Purpose: To describe the incidence, prevalence, morbidity and mortality of CRC internationally and offer evidence-based CRC interventions in order to provide appropriate guidelines for the primary care practitioner as it relates to primary and secondary CRC preventative services</p>	<p>Design: Systematic review of a variety of randomized control trials, case-control studies and observational cohort studies.</p> <p>Sample/Setting: N/A</p>	<p>Findings: The randomized control trials involving the fecal occult blood test revealed good internal validity, good consistency, 15%-33% magnitude of effect, and fair external validity. The randomized control trials involving the sigmoidoscopy revealed good internal validity, good consistency, approximately 25% and 50% magnitude of effect for descending colon, and fair external validity. The case-control studies involving the digital rectal examination revealed fair internal validity, good consistency, no magnitude of effect, and poor external validity. The case-controlled and observational cohort studies involving a colonoscopy revealed poor internal validity, poor consistency, nearly 60%-70% magnitude of effect for the descending colon; uncertain for ascending colon, and fair external validity.</p> <p>Implications: CRC risk can be decreased through the implementation of primary (obesity prevention, nutrition counseling and tobacco cessation) and secondary (visual or stool-based screenings) interventions. Primary care practitioners are at the forefront of primary care and are strategically positioned to address factors such as nutrition and weight loss counseling, tobacco cessation, and alcohol use.</p>	I	A
Hirst et al. (2017)	<p>Purpose: To test the viability of a text-message reminder to encourage return of completed fecal occult blood tests</p>	<p>Design: This was a two-armed randomized control trial conducted with a control group whose invitation</p>	<p>Findings: The return of completed fecal occult blood test kits was 39.9% in the control group and 40.5% in the intervention group. The return of fecal occult blood test kits by first time invitees was promising</p>	II	A

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
	and to determine whether a text-message update is increasingly compelling in improving the completion of CRC screenings among first-time invitees than repeat invitees and to determine the adequacy of the text messages by testing the viability among the non-responders who additionally had registered cellular number	came through the usual care path and the intervention group whom received a text message reminder to return kit at 7 weeks post receipt of the test kit.  Sample/Setting: 8,269 screening-qualified adults (48% male and 52% female), 60-74 years of age (median age of 66), whom were randomized to get either an instant message update or no instant message update on the off chance that they had not returned their fecal occult blood test within 8 weeks of receiving the kit.	with 34.9% in the control and 40.5% in the intervention group.  Implications: In spite of the fact that text-message updates did not essentially increase the general populace's return of fecal occult blood test kits, the improvement among first-time invitees was 6% higher in the intervention group. Utilizing text message reminders for first time invitees to return CRC screening kits can be promising.		
Schwebel and Larimer (2018)	Purpose: To provide a systematic narrative review of the application of text message reminders in the primary care arena	Design: A systematic review of randomized control trials and quasi experimental (feasibility studies, before and after, cross sectional and cohort studies).  Sample/Setting: 162 articles were included in the systematic review, which consisted of those published in English from 2003 to 2018, ultimately meeting inclusion criteria after full-text review.	Findings: SMS updates showed amazing promise as an automated support tool in the primary care environment. The systematic review found 86% (48/56) of studies involving appointment reminders and 85% (83/97) of the studies involving medical adherence reminders revealed positive outcomes related with SMS messages. SMS updates can be successfully executed worldwide and in an assortment of settings to help improve healthcare.  Implications: The outcomes demonstrated that the SMS updates give a cost effective, reasonable, simple solution to help increase medical adherence and decrease no-shows. When considering interventions that are cost effective and readily available, the SMS would prove to be an invaluable intervention to consider when implementing a CRC screening improvement program.	I	A
Singal et al. (2016)	Purpose: To compare initial screening participation across the three groups (FIT outreach, colonoscopy outreach, and usual care) among individuals with at least 1 year of post-intervention follow-up	Design: The randomized control trial (3-year comparative effectiveness trial) compared usual care, FIT outreach, and colonoscopy outreach.  Sample/Setting: 5,999 patients with 1,199 patients	Findings: Using intention-to-screen analysis, screening participation rates were higher for FIT outreach (58.8%) and colonoscopy outreach (42.4%) than usual care (29.6%). Screening participation with FIT outreach was higher than colonoscopy outreach. Among responders, FIT outreach had a higher proportion who responded prior to reminders (59.0% vs. 29.7%). Nearly half of colonoscopy outreach patients opted to complete	II	A

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
		randomly assigned to usual care, 2,400 to FIT outreach, 2,400 patients to colonoscopy outreach. Study population included only Dallas county residents, aged 50–64 years, with at least one visit to a Parkland Health and Hospital System primary care clinic in the year prior to randomization without an up to date CRC screen from April 2013 to May 2014. Parkland Health and Hospital System provides access to primary medical care, which includes CRC screening, for uninsured residents of Dallas County.	FIT via usual care. Patients (FIT and colonoscopy outreach arms) completed screening as a direct result of outreach efforts (79.2% and 47.8% respectively); however, some patients in both arms received opportunistic visit-based CRC screening via usual care. Screening participation rates were 58.8% for patients in the FIT outreach arm, 42.4% for patients in the colonoscopy outreach arm, and 29.6% for patients receiving usual care alone.  Implications: Mailed outreach invitations can significantly increase CRC screening rates among underserved populations. FIT-based outreach was more effective than colonoscopy-based outreach to increase one-time screening participation. Effective CRC screening is dependent on completion of the entire screening process, which includes repeat screening in those with normal tests or follow-up evaluation of abnormal screening results.		
Gordon and Green (2015)	Purpose: To recognize steps that could be taken to expand take-up and yearly utilization of the FIT and improve in general CRC screening effort endeavors.	Design: The study used a cross-sectional survey design.  Sample/Setting: Three groups of health plan members ages 52 to 76 who received mailed FIT kits in 3 consecutive years (2010, 2011, and 2012). The study groups were retrospectively created by identifying 2012 FIT completion status and then looking back. “Continuers” completed the FIT in all 3 years. “Converts” completed the FIT in 2012, but not in 2010 or 2011. “Nonusers” did not complete the FIT in any of the 3 years. The three study groups were linked with member race/ethnicity and language preference data. About 99% had language	Findings: Continuers ( $n = 607$ , response rate 67.5 %), Converts ( $n = 317$ , response rate 35.6 %), and Nonusers ( $n = 215$ , response rate 21.1 %) did not differ in perceived risk or family history of CRC, but Nonusers were less likely than Continuers and Converts to know someone who had polyps or CRC. Continuers, Converts, and Nonusers did not differ in social network encouragement of CRC screening, but did differ in believing that it was very important that they be screened (88.3 %, 68.4 %, 47.7 %) and that their medical team thought it very important that they be screened (88.6%, 79.9%, 53.9%). Approximately half of Continuers and Converts completed the FIT to please their doctor. Converts were less likely than Continuers to use the FIT to “make sure they were OK” (53.7 % vs. 72.6 %) or “protect their health” (46.1 % vs. 76.4 %). Nearly half of Converts completed the FIT out of guilt. Approximately half of FIT kit users suggested adding a disposable glove, extra paper, and wider-mouth tube to the kit. Nonusers’ reasons for not using the FIT included discomfort, disgust, or embarrassment (59.6 %); thinking it unnecessary (32.9 %); fatalism/fear (15.5 %); and thinking it too difficult to use (14.5 %).	VI	A

Reference	Purpose	Setting	Findings/Implications	Level of Evidence	Quality of Evidence
		<p>preference data, and among those whose language preference was English, 98% of Continuers, 96% of Converts, and 91% of Nonusers were matched to a race and ethnicity. Stratified random samples of 900 Continuers, 891 Converts, and 1,020 Nonusers. All three study groups included approximately equal numbers of White-Non-Hispanics, Black, and Latino men and women who were ages 52–64 or 65–76 at the time of the survey.</p>	<p>Implications: This study found that, compared with continuous FIT users, nonusers and irregular users of the FIT are less intrinsically motivated to get CRC screening and more averse to preparing their stool sample. Feelings of discomfort, disgust, and embarrassment with collecting the stool are the major reasons for lack of uptake indicated by nonusers. Future controlled trials could show whether changes to the FIT kit to address these factors might improve uptake and continuous use. Nonusers and irregular users of the FIT are less intrinsically motivated to get CRC screening than long-term users and more averse to preparing their stool sample. Changes to the FIT kit to address discomfort and difficulty factors might improve uptake and continued use. In both groups, men were significantly more likely than women to indicate that they did the FIT because their spouse/partner really wanted them to.</p>		