2021

Developing a Clinical Practice Guideline for Colorectal Cancer Screening in Primary Care

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This is to certify that the doctoral study by

Michelle Janise Berkley-Brown

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
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Walden University
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Abstract

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by

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MSN, Case Western Reserve University, 1999

BSN, University of Akron, 1992

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

November 2021

Abstract

Colorectal cancer (CRC) is the second leading cause of cancer deaths in the United States for both men and women combined. CRC screening is an effective way to reduce mortality and morbidity related to the disease. Practitioners within primary care practices can play an essential role in encouraging people to be screened. Yet, CRC screening rates remain low in primary care practices. Evidence-based strategies are available to help practitioners improve CRC screening activities and improve screening rates. The lack of a clinical practice guideline (CPG) with strategies to help improve CRC screening interventions was identified as a practice gap for this project. The practice-focused question for this project aimed to address this gap: In a primary care practice, in which CRC screening rates are low amongst adults 50 to 75 years of age, evidence-based best practices contributed to a CPG for CRC screening in the primary care setting. The practice-, provider-, and patient-level (P3) model was utilized to guide the project. Evidence from literature and appraisals from a panel of physician and nurse stakeholders using the Appraisal of Guidelines for Research & Evaluation (AGREE) II tool was used to develop and appraise a CPG and practice workflow. The quality of the proposed CPG was validated using the AGREE II tool and receiving a 97.9% overall score and consensus from experts that it should be utilized in practice to guide CRC screening interventions. The CPG can be disseminated across health systems to help other practices implement evidence-based CRC screening guidelines that will enhance screening rates resulting in positive social change for patients and communities and improved public health. This can support Walden University's mission of positive social change.

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Dedication

This project is dedicated to my late sister-in-law, Deanna Brown Logan, who never gave up and lived life despite colon cancer; her strength and faith helped inspire my work. She succumbed to colon cancer while I was completing this work.

Acknowledgments

I would like to thank my loving and supportive husband, David T. Brown; my mother, Iris J. Berkley, for teaching me to believe I can do anything I put my mind to; and my circle of family and friends for their prayers, motivation, and love that gave me the strength to keep pushing. Thank you, Walden University. Above all, thank you, Almighty God, who enables me to do all things through his power.

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Section 1: Nature of the Project

Introduction

Colorectal cancer (CRC) is used to describe colon cancer, rectum cancer, or both (Center for Disease Control and Prevention [CDC], 2019). It is a major population health problem contributing to cancer incidence and cancer-related mortality in the United States. CRC is the second leading cause of cancer deaths in the United States for men and women combined (American Cancer Society [ACS], 2020a). In 2020, the ACS estimated 147,950 new cases of CRC in the United States and 53,200 deaths. There are several options for prevention and early detection. It is well documented that an increase in CRC screening rates has reduced mortality and morbidity; however, screening rates are still low (Meester et al., 2015).

The clinical practice problem that was addressed in this project is the low CRC screening rates in primary care settings. According to Healthy People 2030 (HP2030), CRC screening beginning at age 50 years is the most effective way to reduce a person's risk of developing the disease (Office of Disease Prevention and Health Promotion [ODPHP], n.d.). In addition, screening allows for early detection when treatment and recovery are most effective. CRC typically appears in precancerous polyps, and therefore endoscopic removal during a screening colonoscopy reduces the incidence of CRC (Triantafillidis et al., 2017). Despite the potentially life-saving effectiveness of CRC screening, only 25% of adults 50 to 64 years of age in the United States, and fewer than 40% of adults age 65 years and older in the United States are up to date on CRC

screening (ODPHP, n.d.). The nurse practitioner and other primary care providers (PCPs) can play an essential role in encouraging people to be screened.

According to Paskett and Khuri (2015), several studies have shown that the number one reason patients receive CRC screening is because their PCP recommended the screening. Most insurances cover the cost of these services; however, CRC screening rates remain low in primary care practices. CRC has claimed the lives of many and is estimated to claim the lives of many more. Evidence supports that screening significantly reduces both mortality and morbidity (Joseph et al., 2016). This DNP project addressed this gap by developing a CPG to assist practices with consistently implementing evidence-based strategies to improve the process for CRC screening and follow-up from PCP settings. The development and utilization of an evidence-based CPG can improve the uptake of CRC screenings, align with the national strategy for preventing CRC, and reduce the impact on public health. The CPG can be shared across the health system to assist other practices in achieving an increased utilization of preventive CRC screenings and demonstrate a positive social change for patients, families, and communities, yielding a positive public health impact.

Problem Statement

The practice problem that was addressed in this project was the low CRC screening rates in the primary care setting. The primary care practice setting for implementing this Doctor of Nursing Practice (DNP) project was a low-income, inner-city community in the Mid-Atlantic region. The practice is affected by a high incidence of chronic illnesses and multiple social barriers. The practice has consistently struggled

with low CRC screening rates of 18-23% - a rate well below the national rate of 67.3% as well as the local state rate of 69.5% (CDC, 2017). Despite ongoing efforts in the practice to improve CRC screening rates, those screening rates remain significantly low. Consequently, practice quality performance targets for preventive screenings are not being met. Patients that are due for CRC screening are identified during morning huddles and communicated to nursing staff and providers. But frequently, the screening remains not completed.

Low CRC screening rates are especially relevant to address in this population due to the disparities that already exist and the circumstances that increase their risk of disease and death. Black communities and those of lower socioeconomic status are confronted with complexities that increase the risk of CRC-related mortality and morbidity. African Americans are about 20% more likely to get CRC and 40% more likely to die from it than other racial/ethnic groups (ACS, 2020b). They often face major socioeconomic barriers such as lower-paying employment, limited access to nutritious and affordable food, poor education and living conditions, and unsafe environments that prevent CRC prevention, detection, treatment, and survival. The U.S. Preventive Services Task Force (USPSTF, 2016) emphasizes the importance of CRC screenings and highlights the evidence that CRC screening substantially reduces deaths from the disease among all adults aged 50 to 75 years. According to the USPSTF (2021), there has been an increased incidence of CRC in adults younger than 50 years. In addition, African Americans have a higher incidence of CRC. However, the most recent update by the USPSTF (2021) continues to recommend CRC screening in adults aged 50 to 75 years,

and now recommends offering screening starting at 45 years for all adults. There is no specific recommendation based on race. Achieving the public health goal of 80% screening adherence in age-eligible populations could avert more than 200,000 new cancer cases and deaths in the next 20 years (Murphy et al., 2017). Thus, importance is placed on enhancing CRC screening rates in primary care settings to significantly attain Healthy People 2030 (HP2030) national goals for CRC (USPSTF, 2016).

In a practice with low CRC screening rates, having a well-defined practice workflow and a CPG for nursing staff and providers to follow may help improve CRC screening rates. The development, implementation, and consistent use of a CPG for CRC screening will ultimately promote early detection of CRC and improve practice and patient outcomes. The CPG translates evidence into practice to promote CRC screening interventions that can effectively increase screening rates at this practice site and close the existing gap in practice. This DNP project holds significance for nursing practice by providing guidance, education, and translation of knowledge into nursing practice to improve patient outcomes and promote a positive public health change.

Purpose Statement

The purpose of this doctoral project was to address the gap in practice related to the lack of a standardized process for CRC screening interventions by developing an evidence-based CPG. The CPG was developed to provide nursing staff and providers with a well-defined protocol that promotes the consistent use of evidence-based strategies to improve CRC screening rates in the primary care setting. The guiding practice-focused question was: In a primary care practice, in which CRC screening rates are low amongst

adults 50 to 75 years of age, what best practices contribute to a CPG for CRC screening in the primary care setting? This project provides a standardized protocol to assist the staff in ensuring effective strategies are followed consistently to improve CRC screening interventions in primary care.

Nature of the Doctoral Project

For this project, I obtained evidence by reviewing literature from a multi-database search using the Walden University Library, including CINAHL Plus, Medline, SAGE, Thoreau, ProQuest, and Google Scholar. Evidence was also collected from publications and manuals developed by government and professional organizations to address the national strategy of increasing CRC screening rates and reducing the impact of CRC. These included the CDC's Colorectal Cancer Control Program (CRCCP), which uses strategies recommended by the *Guide to Community Preventive Services* (CDC, 2020). It also included the ACS's National Colorectal Cancer Roundtable's (NCCRT) manual: *Steps for Increasing Colorectal Cancer Screening Rates: A Manual For Community Health Centers* (NCCRT, 2020). Additionally, information was utilized from the Walden University's Manual for Clinical Practice Guideline Development and the Appraisal of Guidelines for Research & Evaluation II (AGREE II) as a framework to develop and appraise the quality of a CPG. The use of the practice guideline will improve health care delivery and implementation of nursing interventions that improve CRC screening rates and contribute to overall public health.

Significance

The primary stakeholders for this DNP project were the practice staff, including nurses, medical assistants (MAs), care coordinators, providers, and the patients. The provider, the practice, and the patient are all impacted by CRC and the low uptake of screening recommendations. CRC is still a significant public health concern and is a cause of considerable suffering among more than 140,000 adults diagnosed with CRC each year (Simon, 2015). CRC screening reduces the mortality and morbidity of CRC. In addition to saving lives and reducing the suffering of patients and families, an increase in CRC screening will decrease the economic burden to the Medicare program, insurances, and its beneficiaries in the United States. (Yabroff et al., 2018).

The contributions of this DNP project to nursing practice include enhanced knowledge and awareness about CRC and translation of evidence into a practice guideline with a step-by-step workflow that will assist nursing staff and providers with improving CRC screening interventions and ultimately screening rates in the practice. The CPG can be utilized in other primary care practices to assist with their CRC screening strategies and improve patient outcomes. This DNP project has the potential to create positive social change by providing a framework to increase the early detection and prevention of CRC and potentially reaching the public health goal of 80% screening adherence in age-eligible adults.

Summary

CRC continues to cause significant pain, suffering, and dying in the United States. Despite the life-saving effectiveness of CRC screening, the screening rates remain low.

Increased screening is well documented as an effective strategy to reduce mortality and morbidity, and primary care practices can play an essential role in encouraging people to be screened. In Section 1, the student provided a brief introduction of the DNP project, including the gap in practice, the problem, the nature of the project, the stakeholders, and significance to nursing practice and positive social change. Section 2 introduces the model that informed the project, the background and evidence that justifies the significance of the project, and the role of the DNP student.

Section 2: Background and Context

Introduction

The primary care practice of focus for this DNP project has low CRC screening rates. Despite efforts to improve the uptake of CRC screening recommendations, rates remain low. There was no standard protocol or guideline for the practice nursing staff and providers to follow. According to the review of literature, primary care plays a significant role in CRC screening programs. CRC screening rates improve when practices have effective systems in place with clearly articulated CPGs and PCP involvement (Triantafillidis et al., 2017).

The practice problem addressed in this DNP project was the low CRC screening rates in the primary care setting. The practice-focused question aimed at addressing this practice gap was: In a primary care practice, in which CRC screening rates are low amongst adults 50 to 75 years of age, what best practices contribute to a CPG for CRC screening in the primary care setting? The purpose of this DNP project was to address the gap in practice related to the lack of a standardized process for CRC screening interventions by developing an evidence-based CPG. This CPG sought to provide nursing staff and providers with a well-defined protocol that promotes the consistent use of evidence-based strategies to improve CRC screening activities in the primary care setting. This section elaborates on the guiding models and theories of the project, the relevance to nursing practice, the evidence supporting the development of the CPG, and the role of the DNP student.

Concepts, Models, and Theories

Preventive interventions such as CRC screening are often suboptimal in the primary care setting. Adequate provision of these preventive services may require an interaction of activities at all levels of the clinical encounter. The practice-, provider-, and patient-level (P3) model provided a framework that was used to guide the development of the CPG for this DNP project. It is a framework for addressing preventive care interventions using a comprehensive approach at all levels of the encounter. The P3 model was developed to promote preventive health behaviors and was applied in both vaccination and CRC screening programs as examples (Bednarczyk et al., 2018). Thus, making it an appropriate framework to utilize in this project to improve CRC screening activities in the primary care setting. According to research, interventions grounded in theory result in more effective and long-lasting outcomes than interventions not grounded in theory (Mojica et al., 2018).

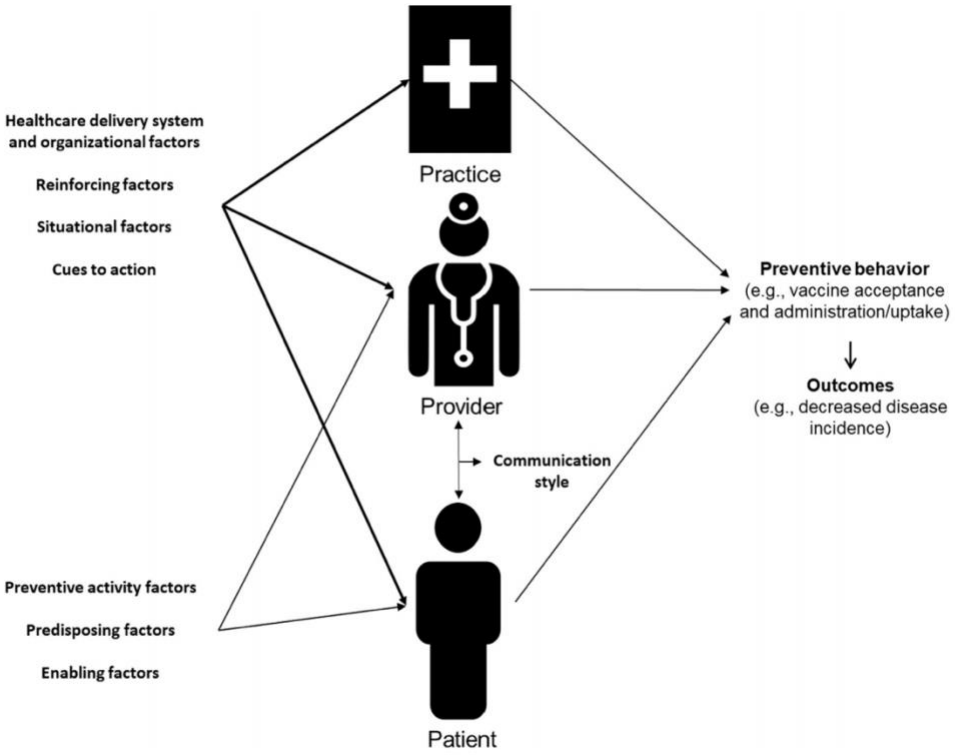
Unlike other theoretical frameworks that primarily focus on one level of the clinical encounter, such as the patient's beliefs and attitudes, the P3 model for preventive care interventions focuses on all three levels of the clinical encounter: the patient, provider, and practice (Bednarczyk et al., 2018). Practical interventions are designed for each component of the model while considering the impacting factors at each level (e.g., organizational, reinforcing, situational, cues to action, preventive activity, predisposing, enabling, and communication). Planning a program that addresses clinical preventive services must consider multiple factors in various levels of medical care, such as adequate transportation and time off for workers to help them get the care they need.

Addressing these additional factors can reduce barriers to preventive care and improve a population's health.

The P3 model can be used across various settings. The model is a combination of key components from several other theoretical models, including the health belief model, theory of planned behavior/theory of reasoned action, social cognitive theory, social-ecological model, and the systems model of clinical preventive care (Bednarczyk et al., 2018). The P3 model can assist with planning preventive interventions by addressing factors that influence each encounter level. This DNP project considered the following influencing factors at each encounter level: (a) patient - lack of knowledge, nonadherence, and social determinants that prevent screenings; (b) provider - lack of time, competing elements, and disagreement with guidelines; and (c) practice - lack of effective workflows or evidence-based protocols. According to Bednarczyk et al. (2018), the P3 model is adaptable and flexible for use in all types of preventive care promotion because of its realistic approach in terms of understanding, developing, implementing, and evaluating the preventive interventions at each level of the encounter (see Figure 1).

Figure 1

Graphical Representation of the P3 (Practice, Provider, Patient) Model



Note. The P3 model shown above with impacting factors and the levels they act on. Reprinted from "Practice-, provider-, and patient-level interventions to improve preventive care: Development of the P3 Model," by R. A. Bednarczyk, 2018, *Preventive Medicine Reports, 11*, p. 131-138 (https://doi.org/10.1016/j.pmedr.2018.06.009). Copyright 2018 by The Authors. Reprinted with permission. View Appendix A.

Relevance to Nursing Practice

A CPG that guides CRC screening activities in a primary care setting advances the field of nursing practice by providing a framework for nursing staff and providers to improve CRC screening rates within the practice setting. It addresses a gap in clinical practice using current evidence. The evidence presented revealed that screening is effective in early detection and diagnosis of CRC when medical intervention is most

successful in reducing mortality and morbidity related to CRC. However, 40% of the U.S. age-eligible patients are still not screened, especially in underserved populations (Bresailier et al., 2020). The significant role PCPs play in patient adherence to CRC screening guidelines is supported in the literature; however, PCPs are not adequately following CRC screening guidelines for several reasons. Many PCPs cite uncertainty about screening options, work overload, low patient compliance, and lack of a systematic, organized approach as barriers to effective CRC screening activities (Unger-Saldana et al., 2020). The lack of a standardized, evidence-based guideline within the primary care setting for this DNP project may have contributed to low CRC screening rates amongst patients and ultimately the burden of CRC in the community.

Nurses maintain accountability for their patients by ensuring that high-quality and efficient care is provided to all patients. Nursing staff and providers contribute to clinical practice outcomes by translating EBP into clinical interventions that promote health and disease prevention. By assisting with the development of a standardized protocol for the CRC screening pathway in the primary care practice, nursing staff and providers are more engaged with a guided process for screening activities to improve overall CRC screening rates. A team-based approach with defined roles is most effective at supporting the activities and ensuring compliance with the protocol. The CPG increases awareness and understanding of the problem amongst nursing staff and providers, increasing their confidence in carrying out the screening activities. The IOM (2011) informed that CPGs provide a framework for establishing best practices backed by evidence to improve patient care and outcomes. They provide a systematic approach that brings together

policy, best practices, and patient choice for improved outcomes. The CPG that was developed for this DNP project incorporates evidence and theory from the literature review and formulates a well-defined protocol with best practice guidelines to improve CRC screening activities in the primary care practice.

The following sections summarize the evidence obtained from the literature review that support the interventions outlined in the CPG. These sections include evidence regarding the importance of CRC screening, screening recommendations, and evidence-based practices that contribute to higher CRC screening rates in primary care practice settings including: (a) PCP engagement, (b) use of a team-based model, (c) patient education and decision making, and (d) utilizing a multicomponent approach to improve screening compliance.

CRC

CRC refers to cancer that starts in the colon (also known as the large intestine) or rectum. It is one of the deadliest cancers in the United States. According to ACS (2020c), CRC is the second leading cause of cancer-related deaths in the United States for both men and women combined. Nearly 135,000 people in the United States are diagnosed with CRC each year, and over 50,000 die because of it annually. According to most recent data from the Surveillance, Epidemiology, and End Results (SEER, 2018), CRC represents 8.1% of all new cancer cases in the United States. The data estimates 1,332,085 people living with CRC in the United States with 39.4 new cases per 100,000 men and women per year and 14.5 deaths per 100,000 men and women per year. It is estimated that 4.4% of men (1 in 23) and 4.1% of women (1 in 25) will be diagnosed with

CRC in their lifetime. At 5 years after diagnosis, the relative survival rate for CRC is 64%, and at 10 years, it is 58% (ACS, 2020c). Additionally, this will have a substantial future economic burden on the Medicare program and its beneficiaries in the United States.

CRC usually begins as a noncancerous (benign) adenoma or polyp (abnormal growth) on the colon or rectum lining. Because of their proclivity for malignant transformation, colon polyps are thought to be a gateway to CRC (Aydin & Aydin, 2021). Polyps are usually asymptomatic and provide no indication that they are present. Some present with major symptoms, including bleeding, abdominal pain, changes in bowel habits, and intestinal obstruction. Colon polyps or growths can be removed during a screening colonoscopy to significantly reduce the risk of cancer. If left undetected or untreated, they can develop into cancer. The risk of a colon polyp developing into cancer can range from 8% to 24% in 10 to 20 years, respectively (Aydin & Aydin, 2021). Thus, early detection and endoscopic removal of colon polyps are critical to preventing CRC.

CRC Screening Recommendations

Compelling research has shown that evidence-based screening is quite effective in early identification, prevention, and improved prognosis of treatment of CRC (USPSTF, 2016). The USPSTF (2016) recommendations are based on a rigorous review of existing peer-reviewed evidence. They are intended to help primary care clinicians and patients decide together whether a preventive service is right for a patient's needs. The most recent update by the USPSTF (2021) continues to recommend CRC screening in adults aged 50 to 75 years, and now recommends offering screening starting at 45 years for all

adults even if risk factors are absent. CRC screening may include all screening options, including stool-based testing with either high-sensitivity quiac-based fecal occult blood testing (HSgFOBT) or fecal immunochemical test (FIT), colonoscopy, and sigmoidoscopy. The ACS also recommends starting CRC screening at age 45 years through age 75 years (Wolf et al., 2018). The decision to screen between age 76 and 85 years is still based on patient screening history, life expectancy, and health status (USPSTF, 2021). Screening is usually stopped at age 85 years. The USPSTF (2021) emphasizes that all options are acceptable and that the focus should be on getting the screening completed since there is strong evidence that screening reduces the incidence and mortality of CRC. According to the NCCRT (2020), colonoscopy every 10 years or annual stool-based blood testing are the two most common screening methods for average-risk patients. Sigmoidoscopy is not frequently used; however, it is an effective screening method if used with high-quality techniques, and a positive screening is referred for colonoscopy.

Despite the evidence that screening is an effective intervention to prevent CRC and promote early detection when treatment is more successful, a significant portion of age-appropriate adults are still not being screened. Therefore, the best option is the one that is mostly likely to be utilized, and there is no overwhelming evidence that one is more effective than the other (Shellnutt, 2020). Thus, when developing a CRC screening program, it is best to consider the population's barriers to screening and their preferences. For example, disadvantaged populations with barriers related to access, and socioeconomic status, may prefer using HSgFOBT or FIT as a less invasive evidence-

based screening method. Further, the NCCRT (2020) emphasizes using both colonoscopy and stool-based tests to reach target CRC screening rates.

Evidence-Based Practices for CRC Screening

Provider Engagement

Researchers have supported achieving the public health goal of 80% screening adherence in age-appropriate populations to avert more than 200,000 new cancer cases and deaths in the next 20 years (Murphy et al., 2017). The role of primary care is critical to improving CRC screening rates and achieving the national targets. According to Triantafillidis et al. (2017), CRC screening requires the input of the PCP. The PCP can impact the CRC screening path, starting with the patient reminder, screening enrollment, referral, early diagnosis, and pre-and post-treatment care for cancer. The PCP and nursing staff are typically the initial point of contact with the patient in the CRC screening pathway, collaborating with specialists and offering screening options. The PCP recommendations and endorsement is a critical determinant in screening participation. The success indicator of CRC screening activities is in the amount of PCP involvement and the ability to integrate effective screening systems and procedures in service delivery (Triantafillidis et al., 2017). PCPs are in a position to ensure high-quality care for their patients. Further, having a well-defined CPG with clinical workflows that support a comprehensive approach to CRC screening and evidence-based primary care interventions can help PCPs who aim to improve CRC screening activities.

Patient Decision-Making

Patient and provider communication is critical in selecting the screening modality that will get done. Updated ACS guidelines for CRC screening highlights the importance of the patient's choice when selecting a screening test (Volk et al., 2018). The goal is to increase compliance and adherence to CRC screenings. Further, researchers have shown that patients are more adherent to CRC screening when presented with options that meet their preferences. The decision-making should be collaborative. Numerous researchers have shown that the number one reason patients are adherent to CRC screening is that their PCP recommended the test (Triantafillidis et al., 2017). In one study, patients were less adherent to screening when colonoscopy alone was recommended than to when stool-based screening alone or a choice of both options. If possible, practices should facilitate both screening colonoscopy and high-sensitivity stool testing as options. PCPs must educate patients on the importance of CRC screening and recommend screening options to all eligible patients and have a systematic way to provide follow-up to ensure the recommendation was followed and assist with a referral for cancer treatment as needed.

Practice Team-Based Approach

As previously stated, providers complained about not having enough time or resources to address preventive screening services such as CRC. They also complained of work overload. According to Dill et al. (2019), efforts to improve the delivery of care within primary care practices increasingly focus on redesigning care in ways that utilize the entire primary care team, such as nurse practitioners, physician assistants, nursing

staff, care coordinators, and the MAs. Miller (2019) highlighted several studies in which the MA role was expanded to assist PCPs with improving preventive screening services and demonstrated an increase in patients up-to-date with CRC screening from 23% to 34%. Another study showed the expanded MA role was associated with a 123% improvement in colonoscopy referrals among seven practices in Utah (Miller, 2019). Researchers have demonstrated an overall improvement in primary care workforce efficiency and quality when a team-based approach is implemented (Jerzak, 2019).

Multiple studies demonstrate the vital role of primary care in adherence to CRC screening strategies. However, the PCP cannot do it alone. A systematic approach requires the involvement of the PCP and the practice staff to support the role of primary care in achieving quality outcomes and implementing effective CRC screening strategies (Holden et al., 2020). In addition, health information technology (HIT) can support the practice and system-level interventions (e.g., health maintenance records that identify patients due for screenings and automated provider reminders), which are known to be effective screening strategies (Jerzak, 2019). Bringing awareness about the importance of CRC screening to the team and defining their roles to implement multiple evidence-based interventions has shown to be an effective approach at improving CRC screening rates in primary care practice (Triantafillidis, 2017).

Multicomponent Approach

According to the Community Preventive Services Task Force (CPSTF, 2017), strong evidence indicates the use of multicomponent interventions to effectively increase CRC screening. The CSPTF developed a Guide to Community Preventive Services with

a list of evidence-based interventions for increasing CRC screening. The interventions are divided into three strategies: increasing community demand, increasing community access, and increasing provider delivery. A multicomponent approach combines two or more of these strategies. A systematic review of studies by the CPSTF (2017) revealed that colonoscopy and stool based (FOBT) screening improved by 15.4 % as a result of multicomponent interventions. The most significant increases were yielded when interventions were combined from all three strategies (CPSTF, 2017). Other studies that were reviewed to support this DNP project also emphasized the importance of multilevel interventions over single-level interventions to lead sustainable changes.

Recommended interventions target all three levels of the clinical encounter: the provider, the practice, and the patient (Kim et al., 2020). Four of the evidence-based interventions listed in the Guide to Community Preventive Services have been prioritized by the CDC as most helpful in increasing CRC screening rates, including: (a) patient reminders – reminder messages to patients that they are due for screening using various methods (e.g., text, letter, email or phone); (b) provider reminders – a reminder to providers that a patient is due or overdue for screening; (c) provider assessment and feedback – monitor and track provider and practice performance on CRC screening rates and inform provider/practice of performance; and (d) reducing structural barriers – interventions that reduce noneconomic barriers and facilitate access to screening. Patient navigation (guiding patients through health care barriers and helping them access screening and follow-up) and small media (videos and printed materials) are other

effective interventions that can be added to improve screening rates (DeGross et al., 2018).

Several evidence-based strategies work to help improve CRC screenings in the community. According to the literature review, they worked best when more than one intervention was utilized together. Federally qualified health centers or practices in underserved areas have low CRC screening rates. This DNP project advances nursing practice by providing a systematic guideline with a practice protocol that includes multicomponent interventions to assist the nursing staff and providers in CRC strategies that increase the screening rates within the primary care practice.

Local Background and Context

The evidence identified at the practice site that supports the relevance of the problem involves the below-average screening rates and provider and nursing staff's view of not having resources or a systematic protocol to help guide screening activities. The physicians, nurse practitioners, and other nursing staff explained that there was no standard guideline for assisting staff with screening activities that will help improve the CRC screening process. Although referrals were being made for colonoscopy and FIT testing, screening recommendations varied by provider, and patients were not completing the screenings. Further, nursing staff and providers were not aware of their individual performance or the practice performance for CRC screening compared to local or national benchmarks.

The practice site for this DNP project was a primary care practice located in a low-income, inner-city neighborhood in the Mid-Atlantic area. The practice is a part of a

free-standing medical facility that houses an emergency room, observation unit, outpatient substance abuse, behavior clinics, and diagnostic testing. The facility is part of a large local health system. The practice is impacted by a high incidence of chronic illnesses and multiple social barriers related to income, education level, housing, and substance use. Despite ongoing efforts to improve preventive screening rates, the practice has long struggled with low CRC screening rates of 18-23% – a rate well below the local state rate of 69.5 % and the national rate of 67.3 % (CDC, 2017).

Achieving the public health goal of 80% screening adherence in age-eligible populations could avert thousands of new cancer cases and deaths each year. (Murphy et al., 2017). Thus, importance is placed on strategies that enhance CRC screening rates in the primary care settings (USPSTF, 2016). A CPG could enhance provider and nursing staff awareness of the problem and help guide evidence-based practices to increase their confidence and ability to improve CRC screening rates.

Role of the DNP Student

As an advanced practice nurse practitioner, nurse leader, and DNP student, I have been involved with multiple quality improvement initiatives to help improve patient care, patient outcomes, and operational practices. I have been working for the practice site as the director for population health and ambulatory practices over the past 8 years. I have had the responsibility of tracking quality measures, addressing gaps with providers and practices, and implementing programs to improve metrics and outcomes. CRC screening rates were identified as one of the practice metrics in which a significant opportunity to improve was noted. Three years ago, the practice participated in a 3-month pilot with the

local health department to educate providers and patients on CRC and received $1,000.00 to assist with educational materials, incentives ($10 gift cards to return FIT test), and transportation needs. The project yielded a 10% increase in CRC screening rates. However, once the incentives were gone, rates soon dropped back to baseline, which was well below the local average.

Personally, the motivation for this DNP project came from a pursuit to understand why CRC screening rates were so low in this population, knowing that CRC screening could save many lives. I realized that nursing staff and providers had nothing in place to guide their workflow. I wanted to identify and remove the barriers for the nursing staff and the patients to improve compliance rates with CRC screening, an effective preventive service. I also had two close relatives diagnosed and treated for CRC; one is a 70 year old who is now a 10 year survivor, and the other was a 46 year old who succumbed to CRC this year after a 3-year battle. My role in this DNP project was to translate evidence-based strategies into a CPG to assist the nursing staff and providers in CRC screening interventions. A CPG would significantly improve CRC screening rates at the practice site and could be used by other practices to improve patient outcomes. My motivations made me aware of potential biases I may have had. Therefore I identified a project team to evaluate the evidence and the CPG utilizing the AGREE II tool.

Role of the Project Team

The project team consisted of the Chief Medical Officer (CMO), two family practice providers, including one family nurse practitioner and one physician, the practice manager, the nurse manager, the director of quality who is a registered nurse, and the

DNP student. The project team was presented with information about the practice problem and performance, local and national targets, evidence to support the DNP project and CPG, and the utilization of the AGREE II evaluation tool. The team helped revise the CPG based on their recommendations and provided final approval prior to submission to the medical executive board (MEC). The final CPG was disseminated to all key stakeholders, including the practice manager of the primary care practice for practice implementation.

Summary

In this section, the student presented the P3 model that was used as a framework to guide this DNP project and the development of a CPG for CRC screening in the primary care practice. The student discussed evidence with the team that supported the screening recommendations and strategies that were incorporated in the CPG to improve CRC screening activities. The student discussed the gap in practice and significance to nursing practice, the local background, the role as the DNP student, and the role of the project team in the development of the CPG using the AGREE II evaluation tool. Section three describes the project's data collection, analysis, synthesis, and summary.

Section 3: Collection and Analysis of Evidence

Introduction

CRC is the second leading cause of cancer deaths in the United States for men and women combined, claiming over 50,000 lives annually (ACS, 2020). There are several options for prevention and early detection. It is well documented that an increase in CRC screening can reduce mortality and morbidity; however, screening rates are still low (Meester et al., 2015). Despite the potentially life-saving effectiveness of CRC screening, only 25% of adults aged 50 to 64 years in the United States, and fewer than 40% of adults aged 65 years and older in the United States are up to date on CRC screening (ODPHP, n.d.). The clinical practice problem that was addressed in this project is the low CRC screening rates in primary care settings.

The primary care practice setting for the implementation of this DNP project has consistently struggled with low CRC screening rates of 18% to 23% - a rate well below the national rate of 67.3% as well as the local state rate of 69.5% (CDC, 2017). Despite ongoing efforts in the practice to improve CRC screening rates, those screening rates remain significantly low. During a department staff meeting, providers and nursing staff explained that there is no standard protocol or resources to assist with CRC screening activities. They verbalized frustration related to the patient's referral and appointment noncompliance. The practice is located in a disadvantaged community in which patients are impacted by multiple social barriers that contribute to their healthcare practices. The purpose of this doctoral project was to address the gap in practice related to the lack of a standardized process for CRC screening interventions by developing a CPG. The CPG

provides the nursing staff and providers with a well-defined protocol that promotes the consistent use of evidence-based strategies to improve CRC screening activities in the primary care setting.

Practice-Focused Question(s)

The primary care practice for this DNP project has consistently struggled with low CRC screening rates of 18% to 23% - a rate well below the national rate of 67.3% as well as the local state rate of 69.5% (CDC, 2017). Efforts to improve CRC screening rates have not been successful, and screening rates remain significantly low. Consequently, practice quality metric targets for preventive screenings are not being met. Patients that are due for CRC screening are identified during morning huddles and communicated to nursing staff and providers. But frequently, the screening remains not completed. The purpose of this doctoral project was to address the gap in practice related to the lack of a standardized process for CRC screening interventions by developing a CPG. The CPG provided nursing staff and providers with a well-defined protocol that promotes the consistent use of evidence-based strategies for CRC screening interventions in the primary care setting. The practice-focused question aimed at addressing this practice gap was: In a primary care practice, in which CRC screening rates are low amongst adults 50 to 75 years of age, what best practices contribute to a CPG for CRC screening in the primary care setting? This project provides a standardized CPG with a protocol to assist the staff in ensuring effective strategies are followed consistently to improve CRC screening activities in primary care.

Sources of Evidence

To address the practice-focused question, the student reviewed, organized, and appraised literature containing evidence on best practices for CRC screening to be utilized in a primary care practice. The review of literature was obtained from a multi-database search using the Walden University Library, including CINAHL Plus, Medline, SAGE, Thoreau, ProQuest, and Google Scholar. The scope of the evidence was within the last five years from peer-reviewed journals, articles, and books. Evidence was also collected from publications and manuals developed by government and professional organizations to address the national strategy of increasing CRC screening rates and reducing the impact of CRC. These included the USPSTF because they provided information based on a rigorous review of existing peer-reviewed evidence and are intended to help practices make decisions regarding preventive services such as CRC screening. In addition, the CDC's Colorectal Cancer Control Program (CRCCP), which used strategies recommended by the *Guide to Community Preventive Services* (CDC, 2020). Also included was the ACS's Steps for Increasing Colorectal Cancer Screening Rates: A Manual for Community Health Centers (NCCRT, 2020) because they were most appropriate to the target population.

The following search terms were used in the literature search: colon cancer, colorectal cancer, colorectal cancer screening, colorectal cancer screening and primary care, preventive care, clinical practice guidelines, teamwork, CRC screening strategies, medical assistants, and team-based care. Inclusion criteria included articles written in English, peer-reviewed sources, and published within the past 5 years. Exclusion criteria

included literature related to cancer diagnosis and treatment. In addition, guidelines from the Walden University's Manual for Clinical Practice Guideline Development were followed along with feedback from an expert panel to develop the CPG.

Tools from the Centre for Evidence Based Medicine (CEBM, 2011), and the Johns Hopkins Medicine Center for Evidence-Based Practice (n.d.) were used to review, appraise, and categorize the literature by topic, strategy and quality using the following criteria: (a) author and date, (b) design, (c) topic, (d) strategy, (e) findings, (f) implications, and (g) level of evidence. The grading and scoring of the evidence in the literature review was done according to the Oxford Centre for Evidence Based Medicine (OCEBM) Levels of Evidence Table and the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) Level and Quality Guide (see Appendices B and C). The summary of the review and appraisal can be found in Appendix E. Notes were maintained on each article to keep track of those that were kept for inclusion and stored on a personal computer using Citefast, a citation generator tool.

The purpose of the DNP project was met by conducting a comprehensive literature review to support best practices for CRC screening, which were incorporated into a CPG to address the gap in practice related to the lack of a standardized process for CRC screening. This literature review assisted with identifying valuable and relevant evidence that supported the recommendations for the CPG and practice protocol.

Additionally, the Walden University's Manual for Clinical Practice Guideline Development, expert opinion, and the AGREE II framework was used to assist with developing the CPG. The expert panel consisted of five individuals, the Chief Medical

Officer (CMO), a family nurse practitioner, a family medicine physician, the practice manager, and the Director of Quality, who is a registered nurse. The DNP student met with the expert panel to provide and discuss the literature review and summary of evidence that was utilized to develop the CPG. This can be viewed in Appendix E. A draft of the CPG was developed using the steps in the AGREE II framework. The expert panel was provided instructions on the use of the AGREE II tool in which they used to evaluate and comment on the contents of the proposed CPG. This is elaborated on in the next section.

The DNP project did not consist of any experimental risks to human subjects. Expert panelist responses to the AGREE II tool was anonymized. The reviewers received the CPG with appendices, and the AGREE II tool along with instructions for rating each item. They were asked not to write their names on the tool, and to place the completed tool in the envelop provide into the DNP students mailbox. The project was submitted to the Walden Institutional Review Board (IRB) for approval prior to implementing this project. All ethical requirements outlined in the Walden University Manual for Clinical Practice Guideline Development was adhered to. The practice guideline that was developed was based on evidence from the literature for best practice strategies to improve CRC screening activities in the primary care setting. No ethical issues were identified as potential problems for the DNP project.

Analysis and Synthesis

The DNP project was a CPG development project. Once the CPG was developed, the AGREE II tool was used by the expert panel to evaluate the quality of the guideline

developed. It is a valid and reliable tool, comprised of 23 key items and six quality domains to guide the process (Brouwers et al., 2010; Walden University, 2019). Steps for developing the CPG included defining the scope and purpose of the project, getting stakeholder involvement, using rigor to develop the guideline, presenting an applicable guideline with clarity, and formation of the guideline without bias (Walden University, 2019). Instructions were provided to the expert panel on the utilization of the AGREE II instrument. The expert panel reviewed the CPG using the AGREE II instrument to validate content and make recommendations before the final report. The CPG provided nursing staff and providers with a well-defined protocol that promotes the consistent use of evidence-based strategies for CRC screening activities in the primary care setting.

The AGREE II tool contains 23 items and two global rating items that the expert panel scored using a 7 point scale (1- strongly disagree to 7-strongly agree). A quality score was calculated for each domain and given a percentage of the maximum possible score for that domain. A quality threshold was set at greater than 70% across all domains. The DNP student and expert panel discussed the ratings for each domain and came to a consensus to make revisions for those domains scoring less than 70%. Priority was given to the overall assessment section, which included 2 items. This section required the expert panel to make a judgment as to the quality of the guideline (item 1) and whether they would recommend the use of the guideline (item 2). Item 1 of this section was required to receive a rating greater than 70% to be considered high quality; and for item 2 of this section the guideline had to be recommended for use by all reviewers. The student

made revisions based on the ratings and comments from the expert panel and resubmitted for final review and approval.

As stated earlier, the guideline was revised based on the student's and the expert panel's consensus on recommendations across all domains. All recommendations had to align with the evidence. Although none existed, disagreements were to be resolved through the use of evidence to support decisions, with the CMO making the final determination. The final revisions were resubmitted for approval. The final guideline was distributed to all key stakeholders, including the practice manager of the primary care practice, for implementation. Prior to implementing the CPG, the practice CRC screening rates were noted for future analysis outside the scope of this DNP project.

Summary

Section 3 described the sources of evidence used to support this DNP project. Key expert sources contributed evidence-based recommendations to address low CRC screening rates in the primary care setting. The student discussed the literature search, appraisal of evidence, expert feedback, government publications and manuals, and other tools that were used to develop and appraise the CPG. The student elaborated on procedures, project team, protections, and process of analysis and synthesis to advance the project.

In Section 4, the findings and recommendations from the expert panel and the development of the CPG are reviewed. The strengths and limitations of the project are presented as well.

Section 4: Findings and Recommendations

Introduction

The setting for this DNP project was a family practice located in a low-income, inner-city neighborhood in the Mid-Atlantic area. Despite ongoing efforts to improve preventive screening rates, the practice had consistently struggled with low CRC screening rates well below the national and state rate. The practice lacked a standardized protocol in place to assist nursing staff and providers with CRC screening activities. The guiding practice-focused question was: In a primary care practice, in which CRC screening rates are low amongst adults 50 to 75 years of age, what best practices contribute to a CPG for CRC screening in the primary care setting? The purpose of this DNP project was to address the gap in practice by developing an evidence-based CPG with a well-defined protocol that would promote the consistent use of evidence-based strategies to improve CRC activities in the practice setting.

The sources of evidence used to create the CPG included literature containing systematic reviews, peer-reviewed articles, publications and manuals from government and professional organizations, and expert recommendations. Literature was obtained from a multi-database search using the Walden University Library, including material published within 5 years. The student reviewed, organized, and appraised the evidence from the literature using tools from the CEBM and the JHNEBP Model. The grading and scoring of the evidence in the literature review were done according to the OCEBM Levels of Evidence Table and the JHNEBP Level and Quality Guide (see Appendices B and C). The summary of the review and appraisal can be found in Appendix E. The

evidence was categorized by topic and strategy and appraised for the level of evidence and strength of recommendations. Although OCEBM Levels of Evidence Table was primarily used to appraise evidence from systematic reviews and individual studies, the JHNEBP Level and Quality Guide was used to appraise editorials and peer-reviewed articles not accounted for in the OCEBM Levels of Evidence Table. The use of both models allowed for a more extensive reach of studies during the appraisal.

In addition to leveling of evidence, a grade was given for strength ranging from A for high quality or consistent level 1 studies, B for good quality or consistent level 2 or 3 studies or extrapolations from level 1 studies, C for low quality or level 4 studies, and D for level 5 or inconsistent studies. Recommendations were formulated based on consistent evidence appraised for strength, relevance, and value for developing the CPG for CRC screening in the primary care setting. Additionally, an expert panel provided feedback and recommendations that also served as a source of evidence used to create the CPG.

Findings and Implications

An expert panel evaluated the recommended CPG using the AGREE II tool to validate the guideline's content. Additional members were added to the expert panel while some members were replaced due to conflicting priorities among two members and requests from other significant stakeholders to participate. Overall, eight panel members reviewed the CPG using the AGREE II tool, thereby increasing the assessment's reliability. The reviewers included the practice manager, the newly hired nurse manager, three practice providers (a family practice physician, a nurse practitioner, and a physician

assistant), the Director of Nursing Education (a DNP-prepared nurse), the Director of Case Management (a DNP-prepared nurse), and the CMO.

Each panel member was provided the proposed CPG, the Agree II Tool, instructions on using the tool and was asked to return the completed tool in a sealed envelope. As previously stated, the AGREE II tool consists of 23 items that assess six domains and two overall assessment questions. The overall assessment section required the reviewer to rate the guideline's quality and determine whether they would recommend its use. Each item was rated using a 7 point scale (1- strongly disagree to 7-strongly agree), and some reviewers added additional comments. After that, a quality score for each domain was calculated according to the AGREE Next Steps Consortium's instructions (2017). Each domain quality score was calculated by totaling all the scores of the individual items within the domain minus the minimum possible score for that domain, then divided by the maximum possible score for that domain minus the minimum possible score for that domain. This number was then multiplied by 100 for the percentage. As previously stated, a quality threshold was set at greater than 70% across all domains to be considered high quality. Table 1 contains the reviewer's scores for each domain. Based on the scoring, the reviewers gave a high rating of 97.9% for the overall quality of the CPG, and all panelists recommended the CPG for implementation.

Table 1

AGREE II Expert Panel Results

Domains	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6	Expert 7	Expert 8	**Total**
Domain 1									
Item 1	7	7	7	7	7	7	7	7	**56**
Item 2	7	7	7	7	7	7	7	7	**56**
Item 3	7	7	7	7	7	6	7	7	**55**
Domain 2									
Item 4	7	7	7	7	7	6	7	7	**55**
Item 5	6	6	7	7	7	4	7	7	**51**
Item 6	7	6	7	7	7	7	7	7	**55**
Domain 3									
Item 7	7	7	7	7	7	6	7	7	**55**
Item 8	5	7	7	7	7	7	7	7	**54**
Item 9	7	7	7	5	7	6	7	7	**53**
Item 10	7	7	7	7	7	7	7	7	**56**
Item 11	7	7	7	7	7	7	7	5	**54**
Item 12	7	7	7	7	7	6	7	7	**55**
Item 13	7	7	6	7	7	7	7	7	**55**
Item 14	1	1	7	7	7	3	7	7	**40**
Domain 4									
Item 15	7	7	7	7	7	6	7	7	**55**
Item 16	7	7	7	7	7	7	7	7	**56**
Item 17	7	7	6	7	7	7	7	7	**55**
Domain 5									
Item 18	7	7	7	7	7	6	7	7	**55**
Item 19	7	7	7	7	7	7	7	7	**56**
Item 20	7	7	7	7	7	6	7	7	**55**
Item 21	7	7	7	6	7	6	7	7	**54**
Domain 6									
Item 22	7	7	7	6	7	7	7	7	**55**
Item 23	1	7	6	7	7	7	7	7	**49**
Overall Assessment									
Item 1 Rate the overall quality of this guideline.	7	7	7	7	7	6	7	7	**55**
Item 2 I would recommend this guideline for use.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

Domain 1

Domain 1 of the AGREE II tool considers the guideline's scope and purpose, focusing on the overall aim, specific health questions, and target population (AGREE

Next Steps Consortium (2017). The domain quality score for domain 1 was 99.3%. There were no suggested modifications for this domain. Two reviewers commented that a CPG that includes a practice protocol such as the recommended guideline is critical to CRC screening in low to average-risk populations. All reviewers commented that the guideline's purpose was clear and well stated.

Domain 2

Domain 2 of the AGREE II tool considers stakeholder involvement and focuses on whether the guideline development included the appropriate stakeholders and speaks to the intended users (AGREE Next Steps Consortium (2017). The domain quality score for domain 2 was 95.1%. One reviewer commented that the inclusion of the MA was valuable and unique to this practice guideline. Another reviewer asked the DNP student scholar to clarify the difference between the target population and the stakeholders. It was explained that the stakeholders are the intended users of the CPG in practice targeting age-appropriate average risk patients for screening. The score for this domain reflects appropriate stakeholder involvement.

Domain 3

Domain 3 of the AGREE II tool considers the rigor of development of the guideline (AGREE Next Steps Consortium (2017). This domain focuses on the systematic review, synthesis, and analysis of the evidence to formulate the recommendations for the guideline. The domain quality score for domain 3 was 93.2%. One of the reviewers asked about the exclusion criteria and limitations in the literature. The reviewers were directed to view the evidence table provided to them upon this

request. This table can be viewed in Appendix E. There was also a question about how often the guideline would be updated. It was explained that this would be based on the organizational policy. No suggestions for modification were noted. The score and comments for this domain reflected the reviewer's consensus that the guideline was well developed, the evidence was clear and relevant, and the recommendations were aligned with the evidence.

Domain 4

Domain 4 of the AGREE II tool assesses clarity of presentation related to the guideline's language, structure, and format (AGREE Next Steps Consortium, 2017). The domain quality score for domain 4 was 98.6%. The reviewers commented that the guideline was thorough, well-written, and concise. One reviewer stated that the inclusion of a practice protocol with staff responsibilities was incredibly beneficial. Another reviewer commented that using the P3 Model to develop the guideline and establish interventions for each encounter level is highly appropriate and beneficial to the practice. The score for this domain reflects the reviewer's agreement with the guideline and opinion that the guideline is presented clearly.

Domain 5

Domain 5 of the AGREE II tool examines the guideline's applicability in relation to barriers and facilitators for implementation, plus the various strategies to increase usage and resources required to incorporate the guideline (AGREE Next Steps Consortium, 2017). The domain quality score for domain 5 was 97.9%. One reviewer commented that the inclusion of the staff roles and practice protocol was an essential

component for implementation and utilization. The score for this domain represents the reviewer's consensus that the guideline is relevant and appropriate for implementation in the practice.

Domain 6

Domain 6 of the AGREE II tool considers editorial independence, which focuses on the guideline's recommendations being free from bias due to competing interests (AGREE Next Steps Consortium, 2017). The domain quality score for domain 6 was 91.7%. There was a comment that this was not recorded or mentioned in the guideline. It was pointed out to the reviewers and noted in the CPG that there were no competing interests. The score reflects agreement.

Overall Assessment

The overall assessment is the final section of the AGREE II tool and consists of two questions. This section requires the reviewer to take into account all the previous items and make a judgment related to the overall quality of the guideline and whether the guideline should be recommended for use in the practice (AGREE Next Steps Consortium (2017). As stated in the AGREE II Next Steps Consortium (2017), it is important to point out that there is a degree of personal judgment required when giving guideline ratings. To assist the reviewers, the criteria and considerations are there to guide rather than to replace it.

The reviewer's scores for the first question related to the overall quality of the guideline was 97.9%, reflecting agreement amongst the reviewers and a high rating for

the overall quality of the CPG. For the second question, which asks would you recommend this guideline for use, all reviewers answered Yes.

The review and appraisal of this CPG yields recommendations to guide CRC screening interventions in the primary care setting. One limitation noted was the lack of a procedure for updating the guideline. The student added a notation to the guideline that the organization policy would be adhered to for updating guidelines (e.g., annually or every 3 years). Another observation was the lack of a process for auditing and monitoring staff compliance with roles and responsibilities. Although mentioned in the step-by-step protocol as a role for practice management or administration, the process was not described in detail. The expert panel suggested random chart reviews as needed but was satisfied with the provision of practice and provider performance data on CRC screening rates as stated in the protocol. The practice CRC screening rates prior to implementing the CPG were noted for future analysis outside the scope of this DNP project. Lastly, the student added a comment to the guideline to state that the guideline was free of bias due to competing interests.

Developing the CPG with a well-defined practice protocol for the primary practice will give providers and staff a step-by-step workflow to improve CRC screening interventions within the practice. As stated throughout this DNP project, evidence supports that increased CRC screening can save many lives. The CPG can enhance the uptake of CRC screenings, align with the national strategy for preventing CRC, and reduce the impact on public health. This positive change will impact the lives of many and improve human and social conditions that support the National Colorectal

Roundtable initiative to achieve 80% screening rates in every community (Shellnutt, 2020). The CPG can be shared across health systems to assist other practices in increasing utilization of preventive CRC screenings and demonstrating a positive social change for patients, families, communities, and organizations, yielding a positive public health impact. This positive public health impact can support Walden University's mission of positive social change and the HP2030 goals.

Recommendations

Based on the review and analysis of literature, evidence, and expert opinion, the DNP student developed a CPG with recommendations and a practice protocol, including staff roles and responsibilities. This can be viewed in Appendix F and G. The CPG is intended to optimize patient care and address the gap in practice related to the lack of a standardized process for CRC screening interventions. The CPG incorporates strategies to provide nursing staff and providers with a well-defined protocol that promotes the consistent use of evidence-based strategies to improve CRC screening rates in the practice. The key evidence that supports the recommendations and protocol are summarized below:

- CRC screening is a key national strategy for prevention and early detection of CRC (Shellnut, 2020).
- Adhering to screening guidelines can avert more than 200,000 new cases and deaths in the next 20 years (Murphy et al., 2017).
- The most recent update continues to recommend CRC screening in adults aged 50 to 75 years and now recommends offering screening starting at 45 years for ALL

adults even if risk factors are absent. The decision to screen between age 76 and 85 years is still based on individual patient screening history, patient preference, and overall health status. Screening should be discontinued after age 85. Those with increased risk or family history should be screened at an earlier age (USPSTF, 2021).

- Screening options include stool-based testing: (a) high-sensitivity quiac-based fecal occult blood testing (HSgFOBT) or fecal immunochemical test (FIT) every year, and (b) stool DNA-FIT every 1 to 3 years; and direct visualization tests: (a) computed tomography (CT) colonography every 5 years, (b) flexible sigmoidoscopy every 5 years, flexible sigmoidoscopy every 10 years plus annual FIT, and colonoscopy every 10 years (USPSTF, 2021).
- The two most common screening methods for average-risk patients is a colonoscopy every ten years or annual stool-based blood testing (NCCRT, 2020)
- All screening options are acceptable, and the best option is the one that will get done (USPSTF, 2021).
- Provider and patient communication are critical in selecting the screening modality that will get done (Volk et al., 2018).
- Patients are more adherent to CRC screening when presented with options that meet their preferences and considers the population's barriers to screening; The decision-making should be collaborative (Volk et al., 2018).

- Patients are less adherent to screening when colonoscopy alone is recommended than to when stool-based screening alone or a choice of both options (Triantafillidis et al., 2017).
- There is no overwhelming evidence that one option is more effective than the other (Shellnutt, 2020).
- The number one reason patients receive CRC screening is because their PCP recommended the screening; thus, provider engagement is critical (Paskett & Khuri, 2015; Triantafillidis et al., 2017).
- Primary care team awareness about the importance of CRC and defining roles to implement multiple evidence-based interventions has shown to be an effective approach at improving CRC screening rates in primary care practice (Holden et al., 2020).
- Several studies show that a team-based approach is effective at improving practice efficiencies such as preventive screening services (Jerzak, 2019).
- One study showed an 11% increase in patients up to date for CRC screening with MA involvement in an expanded role (Jerzak, 2019; Miller, 2019).
- Another study yielded a 123% increase in colonoscopy referrals when the MA role was expanded (Miller, 2019).
- Multiple studies provide evidence for the critical role of primary care and the use of multilevel interventions (provider level, patient level, and practice/system level) to increase CRC screening and follow-up care (CPSTF, 2017; Kim et al., 2020).

- Multicomponent interventions increase CRC screening by any test by a median of 15.4%when compared with no intervention (CPSTF, 2017).
- Evidence-based interventions prioritized by the CDC as most helpful in increasing CRC screening rates, include: (a) patient reminders, (b) provider reminders, (c) provider assessment and feedback on performance, (d) reducing structural barriers, (e) patient navigation, and (f) small media such as videos and printed materials (CDC, 2020; Degroff et al., 2018).

The evidence-based strategies reviewed from the literature and the P3 Model as the theoretical framework were both used to support and guide the development of the CPG. The following recommendations were formulated and categorized into three encounter levels (i.e., the practice, the provider, and the patient) for practice implementation:

- Practice-Level recommendations include
    - Ensure all staff, including new hires, review and understand the CRC screening protocol and staff roles and responsibilities (See Appendix G).
    - Define and assign staff roles for CRC screening activities within the CRC screening protocol (See Appendix G).
    - Provide current education to all staff regarding the importance of CRC screening, the impact of disease outcomes, screening recommendations, and instructions for colonoscopy and FIT testing (See Appendix H).

  - Ensure CRC screening educational material is available in each patient exam room (e.g., literature and video for patients) to be provided to patients due for CRC screening.
  - Utilize the electronic medical record (EMR) to support practice and system-level interventions (e.g., health maintenance records to identify patients due for screenings during pre-visit planning and intake, provider reminders, and updating patient records with screening dates and results).
  - Conduct morning huddles to provide provider/staff reminders.
  - Provide care coordination and referral services to assist patients with referral management, follow-up, closing the loop, and removing barriers (i.e., transportation, referral assistance, and prior authorization).
  - Monitor and track performance to provide feedback to staff on practice performance for CRC screening rate.
  - Post CRC screening posters in the exam room and waiting area.
- Provider-Level recommendations include
  - Provide providers with educational material related to changes in screening recommendations (See Appendix H).
  - Provider to adopt standardized, evidence-based protocols for CRC screening.
  - Provider to assess EMR prompts, Health Maintenance, and/or MA/Nurse prompts for patients who need CRC screening.

  - The provider communicates with the patient/family about risk factors and screening options (e.g., FIT testing annually or colonoscopy every 10 years), making appropriate recommendations using standard patient decision-making tools if needed (Appendix H).
  - The provider supports patient decisions and encourages compliance
  - Provider to initiate referral and communicate with MA/Nurse/Referral Coordinator for follow up
  - Provider explains next steps to the patient (e.g., consult with GI specialist before scheduling colonoscopy and bowel prep for colonoscopy).
  - Provider to assess for potential barriers and communicate to care team for care coordination and navigation services.
  - Provider to set reminders within EMR for follow-up with the patient.
  - Provider letters to be sent to patients due for a screening or who have not returned the FIT test. Sample letters can be viewed in Appendix I.
- Patient-Level recommendations include
  - Patient educational material is provided to patients due for CRC screening, including a video link for CRC and screening options while in the office if possible or mailed to home (See Appendix H)
  - Patient reminders are sent via phone call, text, or letter to patients identified as due for CRC screening or needing returned FIT test. Sample letters can be viewed in Appendix I.

- Follow up with patients who were given a colonoscopy referral or FIT test kit and have not returned the kit or completed the colonoscopy after one month. If not returned or completed, continue to follow up every month for up to 3 months after the initial kit or referral is given with a phone call, text, or letter. A phone call or personal contact is preferred.
- Patient reminder calls are made for patient appointments.
- Patient outreach and navigation services are provided as needed to assist with barriers such as transportation, bowel prep, and insurance authorization.

Contribution of the Doctoral Project Team

The project team was engaged in the initial discussions related to the practice performance and gaps in practice with CRC screening. Initially, the project team consisted of the practice manager, two practice providers, including one family nurse practitioner and one physician, the director of quality, the Chief Medical Officer (CMO), and the DNP student. The nurse manager and two additional practice providers (a family practice physician and a physician's assistant) joined the team during the review and appraisal of the CPG. In addition, the Director of Quality was replaced by the Director of Nursing Education during the review and appraisal of the CPG due to competing priorities related to an upcoming Joint Commission survey. All project team members were aware of the practice problem and made significant contributions to the development of the CPG. There was a consensus amongst the team that effective CRC screening strategies, including a standard workflow for support staff, were needed to

implement best practices in the practice for CRC screening activities. One project team member shared a study that contributed to the evidence. The project team was presented with information about the practice problem and performance, local and national targets, and evidence to support the DNP project. Once the DNP student developed the CPG, the project team reviewed and appraised the contents of the CPG for quality and validity using the AGREE II tool. The project team was engaged and provided comments and recommendations to help revise and finalize the CPG prior to implementation.

For future plans outside the scope of this DNP project, the project team will submit the finalized CPG to the medical executive council (MEC) for organizational approval and systemwide adoption. Additionally, the team is interested in assessing CRC screening rates pre and post guideline and protocol implementation for future plans outside the scope of this DNP project.

Strengths and Limitations of the Project

This DNP project provides the practice site with effective strategies and a standard protocol to guide CRC screening interventions. The project's strengths include ample current literature to support evidence-based strategies to improve CRC screening interventions in the practice. Other strengths include having an expert panel that is very knowledgeable and supportive of the process for translating evidence-based recommendations into practice; and having a relevant topic to local and national public health goals. Additionally, the expanded role of the MA in the practice provided a unique resource opportunity for the implementation of this project; however, it can be a limitation for other practices.

The DNP project also had limitations. The CPG and practice protocol was developed based on a specific staffing model that requires involvement from several team members including MAs, and referral coordinators, to support the strategies. Other practices may not have the same staffing model and are therefore unable to implement. Lastly, there is no standard process described for auditing staff compliance with the CPG and practice protocol. The practice will need to rely on assessing practice and provider CRC screening rates to evaluate success.

Recommendations for future projects of similar nature would be to consider alternative staffing models when developing the guideline and practice protocol and provide practical suggestions. Additionally, consider ways to audit staff compliance with the CPG and protocol to evaluate utilization and ultimately success.

Section 5: Dissemination Plan

Once the expert panel approved the CPG and agreed that the guideline and practice protocol was appropriate for implementation, a meeting was scheduled with the practice leadership to discuss the plan for dissemination and implementation. During the meeting, it was decided to present the CPG and protocol and the educational resources to support the initiative to all staff during the next department meeting. All staff will be required to sign documentation that they received a copy of the CPG and practice protocol and understand the staff's roles and responsibilities. The documentation will be included in each employee's competency file. New hires will be required to review the CPG and sign off that they reviewed and understand as part of their orientation. An implementation date for the CPG and protocol was established and sent to all staff via the outlook calendar. The practice leadership will ensure that all staff is compliant with reviewing the CPG. After implementation, leadership will ensure the protocol is followed by performing practice rounds, chart reviews, and communicating with providers and staff about how things are going.

Other primary care practices within the health system face similar challenges with CRC screening rates as the practice site for this DNP project. Outside the scope of this DNP project, the DNP scholar intends to work with the practice site's CMO and Director of Quality to obtain system approval for the CPG. The CPG will be presented to the MEC for board approval, then submitted to the system's Quality Committee for approval as a systemwide CPG. The guideline will then be uploaded to the organization's ambulatory policy library, which will be made available to other practices. Additionally, the DNP

scholar intends to collaborate with the system's Director of Ambulatory Services and Chief Nursing Officer to develop a plan for communicating and disseminating the guideline to other practices as a practice protocol. Also, as a member of the American Academy of Ambulatory Care Nursing (AAACN), the DNP scholar finds it appropriate to share the CPG and practice protocol on the AAACN's Open Forum for all special interest groups and communities to have access to for dissemination.

Analysis of Self

The completion of this DNP project provided an opportunity for me to enhance and develop skills as an advance practice clinician (APC), scholar, and project manager. As an APC and nurse leader, this DNP project and learning experience aligned with my organization's quality improvement goals and personal leadership goals. It afforded me the opportunity to utilize advanced competencies to evaluate practice interventions and engage in scholarly dissemination of EBP activities that promote improved health outcomes such as CRC screening. As a nurse leader, this DNP project gave me better insight into the importance of utilizing evidence and theoretical frameworks to collaborate and lead the practice improvement initiative. It expanded my scholarly language and gave me the confidence to effectively communicate and influence evidence-based practice changes amongst senior leadership and physician leaders. The project also positioned me for future growth in the organization as a scholar-practitioner.

Through the scholarship of application, I was able to apply knowledge about evidence-based CRC screening interventions to solve a problem or address a gap in practice. According to the AACN's 2011 DNP Essentials, this application entails the

translation of research into practice and the dissemination and integration of new knowledge, both of which are critical activities for DNP graduates. This DNP project also involved the application of relevant findings to develop a practice guideline and improve clinical practice and the practice environment. Dissemination is an important aspect of clinical scholarship. Becoming comfortable and proficient in disseminating knowledge to be translated into practice are the characteristics of a scholar-practitioner and nurse leader that I believe I have become through this DNP project experience.

As a nurse leader in a resource-constrained organization, I was involved in several major initiatives throughout this DNP project experience. It was extremely challenging at times, but I recognized that managing multiple projects and responsibilities, including the DNP project, was critical for me as a leader and DNP scholar. This DNP journey required project management skills and tools to assist me in engaging key stakeholders for my DNP project, meeting deadlines, and prioritizing multiple tasks related to the DNP project and other projects. I was able to further develop project management skills through collaboration with other leaders and the use of project management tools. I intend to continue honing this skill by utilizing project management and prioritization tools to assist me in concurrently managing multiple initiatives and meeting organizational and personal goals.

There were several challenges experienced while completing this DNP project. As previously stated, there were multiple major initiatives taking place at one time. The practice site was going through a major transition due to being acquired by another health system. The transition to the new health system significantly impacted practice changes

related to a new information system, new policies, and resource changes. The transition also created issues with stakeholder engagement due to increased workload and changes in roles.

It became increasingly difficult to manage my workload and maintain a focus on meeting my DNP project deadlines. I was forced to prioritize and alter project deadlines to accommodate the transition and ensure adequate resource allocation and stakeholder engagement. Not to mention that I was actively involved in the organization's COVID 19 pandemic management activities. I personally lost two close relatives to COVID 19 and my 44-year-old sister-in-law to colon cancer during this time. The loss of my sister-in-law became a motivator for me to complete this project and establish best practices for a CPG and practice protocol that would assist providers and staff in implementing evidence-based strategies for CRC screening activities and ultimately improve health outcomes associated with CRC. The insight gained during my DNP journey to overcome numerous obstacles reinforced the critical role of frameworks in guiding evidence appraisals, effective goal setting, prioritization, communication, and collaboration. Additionally, project management skills and tools aided me in completing this DNP project.

Summary

CRC remains a significant public health problem in the United States, but it does not have to be. CRC screening has the potential to save numerous lives. Although primary care practices are uniquely positioned to increase CRC screening uptake, screening rates continue to be low. Having a CPG with a practice protocol can assist

practices in the primary care setting in making positive changes. This DNP project contributes knowledge to a CPG that will help transform practices and establish a standard of care for CRC screening interventions. It has been demonstrated that implementing a CPG with evidence-based strategies for primary care providers and staff will improve CRC screening activities in the primary care practice setting. It is critical for the doctorate-prepared nurse scholar to disseminate knowledge to improve patient care and act as a catalyst for positive change in nursing practice.

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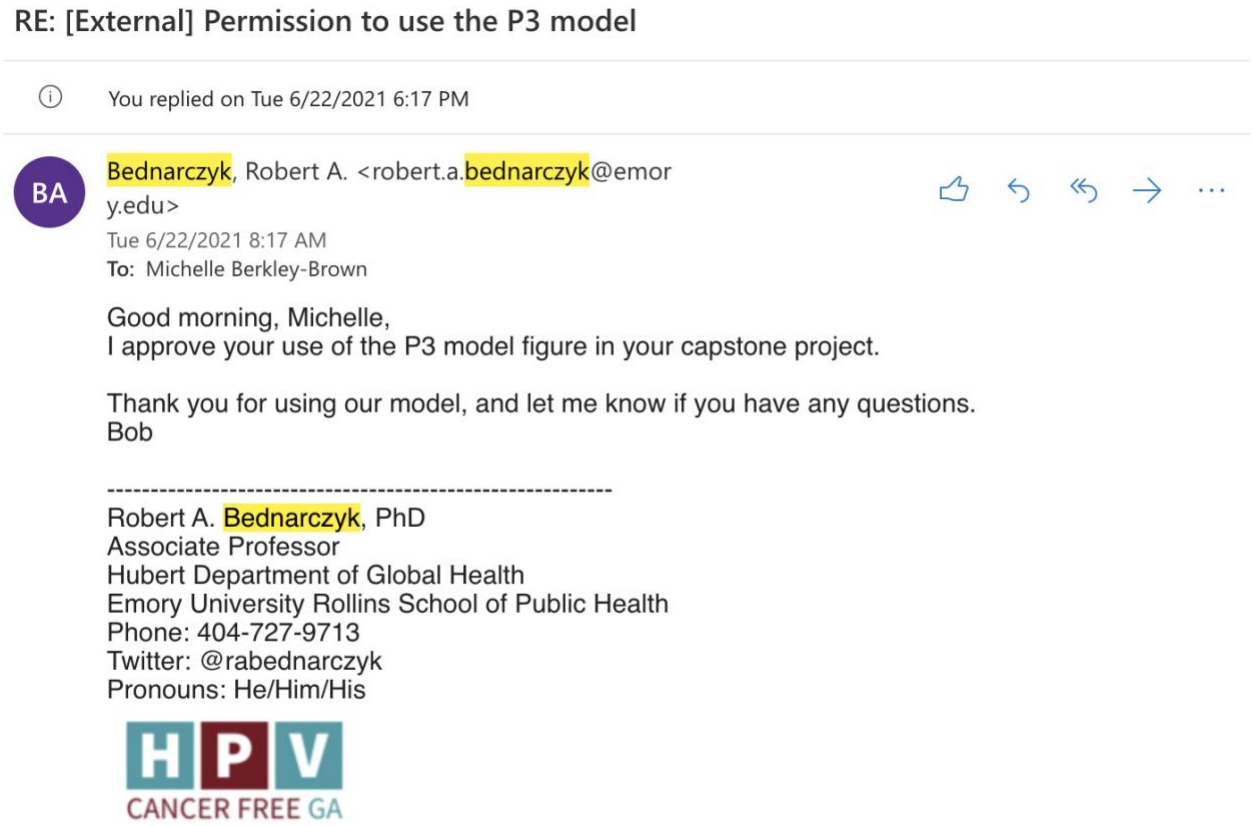
Appendix A: Permission Notice for P3 Model



RE: [External] Permission to use the P3 model

You replied on Tue 6/22/2021 6:17 PM

BA

Bednarczyk, Robert A. <robert.a.bednarczyk@emory.edu>
Tue 6/22/2021 8:17 AM
To: Michelle Berkley-Brown

Good morning, Michelle,
I approve your use of the P3 model figure in your capstone project.

Thank you for using our model, and let me know if you have any questions.
Bob

Robert A. Bednarczyk, PhD
Associate Professor
Hubert Department of Global Health
Emory University Rollins School of Public Health
Phone: 404-727-9713
Twitter: @rabednarczyk
Pronouns: He/Him/His

HPV CANCER FREE GA

Appendix B: OCEBM Levels of Evidence 2011

Question	Step 1 (Level 1)	Step 2 (Level 2)	Step 3 (Level 3)	Step 4 (Level 4)	Step 5 (Level 5)
How common is the problem?	Local and current random sample surveys (or censuses)	Systematic review of surveys that allow matching to local circumstances	Local non-random sample	Case-series	n/a
Is this diagnostic or monitoring test accurate? (Diagnosis)	Systematic review of cross sectional studies with consistently applied reference standard and blinding	Individual cross sectional studies with consistently applied reference standard and blinding	Non-consecutive studies, or studies without consistently applied reference standards	Case-control studies, or poor or non-independent reference standard	Mechanism-based reasoning
What will happen if we do not add a therapy? (Prognosis)	Systematic review of inception cohort studies	Inception cohort studies	Cohort study or control arm of randomized trial	Case-series, case-control studies, or poor quality pronostic cohort study	n/a
Does this intervention help? (Treatment Benefits)	Systematic review of randomized trials or n-of-1 trials	Randomized trial or observational study with dramatic effect	Non-randomized controlled cohort/follow-up study	Case-series, case-control studies, or historically controlled studies	Mechanism-based reasoning
What are the COMMON harms? (Treatment Harms)	Systematic review of randomized trials, nested case-control studies, n-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect	Individual randomized trial or (exceptionally) observational study with dramatic effect	Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow up must be suffient)		
What are the RARE harms? (Treatment Harms)	Systematic review of randomized trials or n-of-1 trial	Randomized trial or (exceptionally) observational study with dramatic effect		Case-series, case-control studies, or historically controlled studies	Mechanism-based reasoning
Is this (early detection) test worthwhile? (Screening)	Systematic review of randomized trials	Randomized trial	Non-randomized controlled cohort/follow-up study	Case-series, case-control studies, or historically controlled studies	Mechanism-based reasoning

Note: Adapted from “Oxford 2011 Levels of Evidence” by OCEBM Levels of Evidence Working Group (http://www.cebm.net/index.aspx?o=5653)

Appendix C: JHNEBP Evidence Level and Quality Scale

Evidence Levels	Quality Ratings
Level I Experimental study, randomized controlled trial (RCT) Explanatory mixed method design that includes only a level I quaNtitative study Systematic review of RCTs, with or without meta-analysis **Level II** Quasi-experimental study Explanatory mixed method design that includes only a level II quaNtitative study Systematic review of a combination of RCTs and quasi-experimental studies, or quasi-experimental studies only, with or without meta-analysis **Level III** Nonexperimental study Systematic review of a combination of RCTs, quasi-experimental and nonexperimental studies, or nonexperimental studies only, with or without meta-analysis Exploratory, convergent, or multiphasic mixed methods studies Explanatory mixed method design that includes only a level III quaNtitative study QuaLitative study Meta-synthesis	**QuaNtitative Studies** **A High quality**: Consistent, generalizable results; sufficient sample size for the study design; adequate control; definitive conclusions; consistent recommendations based on comprehensive literature review that includes thorough reference to scientific evidence. **B Good quality**: Reasonably consistent results; sufficient sample size for the study design; some control, fairly definitive conclusions; reasonably consistent recommendations based on fairly comprehensive literature review that includes some reference to scientific evidence. **C Low quality or major flaws**: Little evidence with inconsistent results; insufficient sample size for the study design; conclusions cannot be drawn. **QuaLitative Studies** No commonly agreed-on principles exist for judging the quality of quaLitative studies. It is a subjective process based on the extent to which study data contributes to synthesis and how much information is known about the researchers' efforts to meet the appraisal criteria. *For meta-synthesis, there is preliminary agreement that quality assessments of individual studies should be made before synthesis to screen out poor-quality studies[1].* **A/B High/Good quality** is used for single studies and meta-syntheses[2]. The report discusses efforts to enhance or evaluate the quality of the data and the overall inquiry in sufficient detail; and it describes the specific techniques used to enhance the quality of the inquiry. Evidence of some or all of the following is found in the report: • Transparency: Describes how information was documented to justify decisions, how data were reviewed by others, and how themes and categories were formulated. • Diligence: Reads and rereads data to check interpretations; seeks opportunity to find multiple sources to corroborate evidence. • Verification: The process of checking, confirming, and ensuring methodologic coherence. • Self-reflection and scrutiny: Being continuously aware of how a researcher's experiences, background, or prejudices might shape and bias analysis and interpretations. • Participant-driven inquiry: Participants shape the scope and breadth of questions; analysis and interpretation give voice to those who participated. • Insightful interpretation: Data and knowledge are linked in meaningful ways to relevant literature. **C Low quality** studies contribute little to the overall review of findings and have few, if any, of the features listed for high/good quality.

Evidence Levels	Quality Ratings
Level IV Opinion of respected authorities and/or nationally recognized expert committees or consensus panels based on scientific evidence Includes: • Clinical practice guidelines • Consensus panels/position statements	A **High quality:** Material officially sponsored by a professional, public, or private organization or a government agency; documentation of a systematic literature search strategy; consistent results with sufficient numbers of well-designed studies; criteria-based evaluation of overall scientific strength and quality of included studies and definitive conclusions; national expertise clearly evident; developed or revised within the past five years B **Good quality:** Material officially sponsored by a professional, public, or private organization or a government agency; reasonably thorough and appropriate systematic literature search strategy; reasonably consistent results, sufficient numbers of well-designed studies; evaluation of strengths and limitations of included studies with fairly definitive conclusions; national expertise clearly evident; developed or revised within the past five years C **Low quality or major flaws:** Material not sponsored by an official organization or agency; undefined, poorly defined, or limited literature search strategy; no evaluation of strengths and limitations of included studies, insufficient evidence with inconsistent results, conclusions cannot be drawn; not revised within the past five years
Level V Based on experiential and nonresearch evidence Includes: • Integrative reviews • Literature reviews • Quality improvement, program, or financial evaluation • Case reports • Opinion of nationally recognized expert(s) based on experiential evidence	**Organizational Experience (quality improvement, program or financial evaluation)** A **High quality**: Clear aims and objectives; consistent results across multiple settings; formal quality improvement, financial, or program evaluation methods used; definitive conclusions; consistent recommendations with thorough reference to scientific evidence B **Good quality**: Clear aims and objectives; consistent results in a single setting; formal quality improvement, financial, or program evaluation methods used; reasonably consistent recommendations with some reference to scientific evidence C **Low quality or major flaws**: Unclear or missing aims and objectives; inconsistent results; poorly defined quality improvement, financial, or program evaluation methods; recommendations cannot be made **Integrative Review, Literature Review, Expert Opinion, Case Report, Community Standard, Clinician Experience, Consumer Preference** A **High quality**: Expertise is clearly evident; draws definitive conclusions; provides scientific rationale; thought leader(s) in the field B **Good quality**: Expertise appears to be credible; draws fairly definitive conclusions; provides logical argument for opinions C **Low quality or major flaws**: Expertise is not discernable or is dubious; conclusions cannot be drawn

Note. Reprinted from "JHNEBP Evidence Level and Quality Guide" by John Hopkins Medicine Center for EBP (https://www.hopkinsmedicine.org/evidence-based-practice/ijhn_2017_ebp.html). Copyright 2017 by The Johns Hopkins Hospital/Johns Hopkins University School of Nursing. Reprinted with permission.

Appendix D: Permission Notice for JHNEBP Model

JOHNS HOPKINS EBP MODEL AND TOOLS- PERMISSION

Johns Hopkins Nursing
Center for Evidence-Based Practice

Thank you for your submission. We are happy to give you permission to use the Johns Hopkins Evidence-Based Practice model and tools in adherence of our legal terms noted below:

- You may not modify the model or the tools without written approval from Johns Hopkins.
- All reference to source forms should include "©The Johns Hopkins Hospital/The Johns Hopkins University."
- The tools may not be used for commercial purposes without special permission.

If interested in commercial use or discussing changes to the tool, please email ijhn@jhmi.edu.

Appendix E: Evidence Table

Author/Date	Source	Design	Topic	Strategy	Findings	Implications	Limitations	Level of Evidence
Triantafillidis et al.(2017)	European Journal of Gastroenterology & Hepatology	Systematic Review	Role of Primary Care	PCP engagement, and multicomponent interventions at all levels of the encounter	Encouraging PCP engagement and A team approach with the use of information systems, the involvement of the patients in decisions about their own care, monitoring practice performance, reimbursement for services such as telephone and e-mail contacts, training opportunities in communication, cultural competence, and the use of information technologies would improve the rate of CRC screening.	Encouraging PCP engagement and a team approach would improve the rate of CRC screening the improvement in CRC screening rates and largely depends on the efforts of PCPs	None noted	1A (CEMB, 2011)

Volk et al., (2018)	American Cancer Society Journals; CA: A Cancer Journal for Clinicians	Commentaries based on systematic reviews	Use of Shared decision making tools to improve screening; and other supporting evidence for multicomponent interventions	Shared decision making as an important strategy to CRC screening compliance;	Patients are more adherent to CRC screening when presented with options that meet their preferences; The decision-making should be collaborative. A large, multiethnic, cluster randomized trial showed lower rates of completing screening when only colonoscopy was offered compared with offering FOBT or a choice between colonoscopy and FOBT.	Provider and patient communication are critical in selecting the screening modality that will get done.	Limitation is that this is a level 3 evidence. However the development of this guideline or framework has established a standard of practice	IIIB (JHNEBP, 2017)

Holden et al., (2020)	Australian Journal of Primary Health	Systematic review of 57 studies	The role of Primary Care in Cancer Screening Program	Primary care team awareness of CRC and defining staff roles in CRC screening interventions	Defining roles to implement multiple evidence-based interventions has shown to be an effective approach at improving CRC screening rates in primary care practice. It was found that primary care plays a vital role in improving CRC process by using multilevel interventions; patient level, provider level, and system level.	Team approach with practice protocol to define roles can be utilized to improve CRC screening in primary care practices	Limitation is related to generalisability. The focus was on an organised population-based screening program, rather than CRC screening more broadly for the eligible population. However, the findings are still relevant given the role of primary care services in non-adherence and preventive care follow up.	1A (CEMB, 2011)
Jerzak (2019)	Family Practice Management	Explanatory Mix Method design	Using the team within primary care and support systems	Team based approach with use of the MA, and use of information technology support in the primary practice	The literature demonstrates an overall improvement in primary care workforce efficiency and quality when a team-based approach is implemented	Team approach with practice protocol to define roles can be utilized to improve CRC screening in primary care practices	Limitation is related to generalizability. Study conducted in large health system. Smaller systems may not have resources to implement	2A (CEMB, 2011)

Miller (2019)	Medical Economics Journal	Peer review/Editorial	Using Empowered CMAs	Team based approach and use of an expanded role MA to improve CRC screening activities	Study showed an 11% increase in patients up to date for CRC screening with medical assistant involvement in an expanded role	Training the MA and other team members in the practice can improve practice efficiency and CRC screening activities	Limitation is that this is a level 4 evidence. However the development of these practice guidelines have established standards of practice	IVA (JHNEBP, 2017)
Kim et al., (2020)	Implementation Science	Stepped Wedge clutter randomized trial	Multilevel interventions	Multilevel interventions (provider level, patient level, and practice/system level) are effective strategies for CRC screening and follow-up care including use of the EMR	In the study, the baseline rate in the intervention group was 30.8%, and it went up to 40.7% in the year 2019 with multilevel interventions such as patient reminders, navigation, referral management, patient education, and removing barriers. Single level interventions are often insufficient to lead to sustainable changes	Multilevel interventions, those that target two or more levels of changes, are needed to address multilevel influences simultaneously.	The limitation is related to the difficulty in obtaining EHR data. Organizations use different systems and the data can be difficult to obtain and organize for research purposes.	2B (CEMB, 2011)

Shellnut (2020)	Gastroenterology Nursing	Editorial/ Peer Review	National Strategy for CRC prevention and early detection	Increasing CRC screening is an effective national strategy for prevention and early detection of CRC. 80% of eligible adults in every community should be screened	A review of the 80% by 2018 campaign revealed that it is one of the most effective screening campaigns in history. The percentage of US adults aged 50-75 years who are up to date with CRC screening rose from 65.2% in 2012 to 68.8% in 2018. That percentage increase of 3.6% equates to 9.3 million more people up to date with screening.	colonoscopy may not appeal to everyone and offering multiple options that fit our patients' lifestyle is imperative.	Limitation is that this is a level 4 evidence. The development of this framework has established the standard of practice	IVA (JHNEBP, 2017)
Paskett and Kuri (2015)	ACS Journals	Editorial/Peer Review	Provider engagement and multilevel interventions	PCP engagement and recommendation is critical to patient compliance; Multilevel interventions prove to be effective in reaching national goal	The number one reason patients receive screening is because their PCP recommended it; Multilevel interventions showed increase in screenings	Provider engagement is essential	Limitation is that this is a level 4 evidence. The development of this framework has established the standard of practice	IVA (JHNEBP, 2017)

Murphy et al., (2017)	Clinical Gastroenterology and Hepatology	Systematic review of surveys	Adhering to screening guidelines	Providers and practices should be aware and recommend screenings for all average risk adults according to guidelines to avert new cases and deaths	Adhering to screening guidelines can avert more than 200,000 new cases and deaths in the next 20 years	CRC screening efforts need to improve. Screening has an important role in reducing CRC incidence	None noted	2B (CEMB, 2011)
CPSTF (2018)	The Guide to Community Preventive Services.	Systematic review	Increasing CRC screening using multicomponent interventions	Multicomponent interventions targeting all 3 levels of encounter (provider patient, and system)	Multicomponent interventions increase CRC screening by any test by a median of 15.4%when compared with no intervention (CPSTF, 2017)	Provides guidelines for a team based approach	Limitations include technology. Additional research would help answer questions or strengthen findings in these areas. What are effects of specific combinations of intervention approaches? • How well do interventions work among people who have low health literacy?	1A (CEMB, 2011)

USPTF (2021)	USPTF	Systematic review	Screening recommendations and strategies to improve screening	Screening in average risk individuals starting at 45 using evidence based screening option and strategies	Screening options include stool-based testing: (a) high-sensitivity quiac-based fecal occult blood testing (HSgFOBT) or fecal immunochemical test (FIT) every year, and (b) stool DNA-FIT every 1 to 3 years; and direct visualization tests: (a) computed tomography (CT) colonography every 5 years, (b) flexible sigmoidoscopy every 5 years, flexible sigmoidoscopy every 10 years plus annual FIT, and colonoscopy every 10 years	Provides guidelines for CRC screening programs	More research is needed to understand the factors contributing to increased rates in Black adults. The USPSTF did not identify any studies that reported on the accuracy of flexible sigmoidoscopy using colonoscopy as the reference standard	1A (CEMB, 2011)
					All screening options are acceptable, and the best option is the one that			

					will get done (USPSTF, 2021).			
NCCRT (2020)	NCCRT	System Review/Literature Review		Patient options that are available should be discussed and offered.	The two most common screening methods for average-risk patients is a colonoscopy every ten years or annual stool-based blood testing (NCCRT, 2020)	Offering both screening modalities can assist with uptake of CRC screening	None noted	1A (CEMB, 2011)
Wolf et al., (2018)	CA: A Cancer Journal for Clinicians	Systematic review	Screening options and patient preferences	Individual preferences can be influenced by patient education about screening, test characteristics, and clinician recommendation.	The ACS recommends that adults aged 45 years and older with an average risk of CRC undergo regular screening with either a high-sensitivity stool-based test or a structural (visual) examination, depending on patient preference and test availability.	Screening options should be explained to patients	The recommendation to initiate screening at age 45 years is based on limited empirical data related to outcomes in average-risk individuals who initiate screening between ages 45 and 49 years.	1A (CEMB, 2011)

DeGroff (2018)	Preventing Chronic Disease	Observational Study. Using CDC's Framework for Program Evaluation, they developed a comprehensive evaluation to assess processes and outcomes for the 5-year program period.	Increasing CRC screening in Health Care Systems	Evidence-based interventions should be prioritized (e.g., having a CRC screening policy, small media such as videos and printed material for patients)	Several factors may support greater screening rate increases including implementing multiple EBIs, making free FOBT/FIT kits available, engaging a clinic champion, and having a CRC screening policy in place. Among the 387 clinics for which screening rate changes were calculated, 50.0% had either 3 or 4 EBIs in place at the end of the first program year	Implementing evidence-based strategies in primary care clinics can achieve sustainable health systems changes for increasing CRC screening	None noted	2A (CEMB, 2011)

CDC (2020)	CDC	Systematic Review	How the CRC control program increases screening	Multicomponent interventions including evidence-based interventions should be utilized	Evidence-based interventions prioritized by the Centers for Disease Control and Prevention (CDC) as most helpful in increasing CRC screening rates, include: (a) patient reminders, (b) provider reminders, (c) provider assessment and feedback on performance, (d) reducing structural barriers, (e) patient navigation, and (f) small media such as videos and printed materials	Practices can incorporate these EBIs into practice guidelines to improve CRC screening process	none noted	1A (CEMB, 2011)
Bednarczyket al., (2018)	Preventive Medicine Reports	Development of a framework based on Systematic Review, Peer-reviewed study	Development of the use of the P3 Model for use in promotion of preventive care	Use of a Theoretical framework is essential to developing guidelines for preventive services	The P3 Model has been demonstrated utility in defining practical activities for preventive care interventions. Key activities were identified	P3 Model a flexible and adaptable framework for use with developing a CPG for CRC screening in	Limitation is that this is a level 4 evidence. However, the development of this framework has established the standard of practice	IVA (JHNEBP, 2017)

					as being applicable to immunizations and CRC screening(e.g., best practices to identify patients needing the preventive service,provider assessment and feedback).	the primary care practice		

Appendix F: Clinical Practice Guideline for Colorectal Cancer (CRC) Screening in Ambulatory Practices

MICHELLE BERKLEY-BROWN, DOCTORAL CANDIDATE

REPORT DATE: AUGUST 1, 2021

QUESTION

In a primary care practice, in which CRC screening rates are low amongst adults 50 to 75 years of age, what best practices contribute to a CPG for CRC screening in the primary care setting?

TARGET POPULATION

Asymptomatic adults 45 years or older who are average risk for CRC, for example no prior diagnosis of CRC, adenomatous polyps, or inflammatory bowel disease

RESPONSIBILITIES/ STAKEHOLDERS

MD/DO, NP/PA, RN, LPN, MA, All Practice team members

PURPOSE

- To increase healthcare professionals' adherence to evidence-based best practices and national recommendations for CRC screening activities.
- To ensure that ambulatory clinics and outpatient settings will implement a comprehensive CRC screening process
- To provide a framework (Practice-, Provider-, and Patient-P3 Model) that will help guide interventions that improve CRC screening activities and result in more effective and long-lasting outcomes.

SCOPE

Ambulatory and outpatient clinic areas

FRAMEWORK AND REFERENCE

Evidence was carefully reviewed, appraised, and synthesized from 13 recent (within the past 5 years) studies including systematic reviews and peer-reviewed articles, and guidelines from government and professional organizations to develop this protocol. Recommendations from the USPSTF were utilized because they are based on a rigorous review of existing peer-reviewed evidence and are intended to help primary care clinicians make decisions regarding preventive services and patient's needs. In addition, the CDC's Guide to Community Preventive Services (CDC, 2020), and the ACS's National Colorectal Cancer Roundtable's (NCCRT) manual: Steps for Increasing Colorectal Cancer Screening Rates: A Manual For Community Health Centers (NCCRT, 2020) were chosen because they were most appropriate to the target population. Also, The P3 Model is used as a framework to guide the interventions. It focuses on all three levels of the clinical encounter – the practice, provider, and patient. Practical interventions are designed for each level while considering the impacting factors at each level (e.g., organizational,

reinforcing, situational, cues to action, preventive activity, predisposing, enabling, and communication).

KEY EVIDENCE

- CRC is the second leading cause of cancer deaths in the United States (US) for both men and women combined
- Evidence reports that CRC screening is an effective way to reduce mortality and morbidity related to CRC
- CRC screening is a pivotal national strategy for prevention and early detection of CRC; It can prevent and allow for early detection when treatment and recovery are most effective (Shellnut, 2020).
- Evidence shows that adhering to screening guidelines can avert more than 200,000 new cases and deaths in the next 20 years (Murphy et al., 2017).
- Age is one of the most important risk factors for CRC, with incidence rates increasing with age and nearly 94% of new cases of CRC occurring in adults 45 years or older
- The most recent update by the U.S. Preventive Services Task Force (USPSTF,2021) continues to recommend CRC screening in adults aged 50 to 75 years, and now recommends offering screening starting at 45 years for ALL adults even if risk factors are absent. The decision to screen between age 76 and 85 years is still based on individual patient screening history, patient preference, and overall health status. Screening should be discontinued after age 85.
- Those with increased risk or family history should be screened at an earlier age.
- USPSTF recommended screening options include stool-based testing: (a) high-sensitivity quiac-based fecal occult blood testing (HSgFOBT) or fecal immunochemical test (FIT) every year, and (b) stool DNA-FIT every 1 to 3 years; and direct visualization tests: (a) computed tomography (CT) colonography every 5 years, (b) flexible sigmoidoscopy every 5 years, flexible sigmoidoscopy every 10 years plus annual FIT, and colonoscopy every 10 years.
- The two most common screening methods for average-risk patients is a colonoscopy every ten years or annual stool-based blood testing (NCCRT, 2020)
- The USPSTF (2021) emphasizes that all options are acceptable and that the focus should be on getting the screening completed since there is strong evidence that screening reduces the incidence and mortality of CRC; the best option is the one that will get done.
- Provider and patient communication is critical in selecting the screening modality that will get done
- Research shows that patients are more adherent to CRC screening when presented with options that meet their preferences; The decision-making should be collaborative.
- Patients are less adherent to screening when colonoscopy alone is recommended than to when stool-based screening alone or a choice of both options (Triantafillidis et al., 2017).
- There is no overwhelming evidence that one option is more effective than the other (Shellnutt, 2020).
- The primary care provider (PCP) can play an essential role in encouraging people to be screened; Studies show the number one reason patients receive CRC screening is because

their PCP recommended the screening thus provider engagement is critical critical (Triantafillidis et al., 2017; Paskett and Khuri, 2015).

- Primary care team awareness about the importance of CRC and defining roles to implement multiple evidence-based interventions has shown to be an effective approach at improving CRC screening rates in primary care practice (Holden et al., 2020).
- Several studies support the role of the primary care team in adherence to CRC screening strategies; Awareness about the importance of CRC to the team and defining roles to implement multiple evidence-based interventions has shown to be an effective approach at improving CRC screening rates in primary care practice (Jerzak, 2019).
- One study showed an 11% increase in patients up to date for CRC screening with MA involvement in an expanded role (Jerzak, 2019; Miller, 2019).
- Another study yielded a 123% increase in colonoscopy referrals when the MA role was expanded (Miller, 2019).
- Multicomponent interventions increase CRC screening by any test by a median of 15.4% when compared with no intervention (CPSTF, 2017).
- Multiple studies provide evidence for the critical role of primary care and the use of multilevel interventions (provider level, patient level, and practice/system level) to increase rates of colorectal cancer screening and follow-up care (Kim et al., 2020; CPSTF, 2017).
- Evidence-based interventions prioritized by the Centers for Disease Control and Prevention (CDC, 2020; Degroff et al., 2018) as most helpful in increasing CRC screening rates, include: (a) patient reminders, (b) provider reminders, (c) provider assessment and feedback on performance, (d) reducing structural barriers, (e) patient navigation, and (f) small media (videos and printed materials).

RECOMMENDATIONS

All recommendations were derived from consistent level 1 to 3 sources of evidence that was evaluated for quality, value, and relevance using the CEBM and JHNEBP models to develop guidelines for CRC screening in the primary care setting. The strength of the recommendations were graded and based on the body of evidence ranging from A for high quality or consistent level 1 studies, B for good quality or consistent level 2 or 3 studies or extrapolations from level 1 studies, C for low quality or level 4 studies, and D for level 5 or inconsistent studies. A summary of the evaluation can be found in Appendix E.

Practice-Level

- Ensure all staff, including new hires, review and understand the CRC screening protocol and staff roles and responsibilities
- Define and assign staff roles for CRC screening activities within the CRC screening protocol
- Provide current education to all staff regarding importance of CRC screening, impact of disease outcomes, screening recommendations.
- Ensure CRC screening educational material is available in each patient exam room (ie. literature and video for patients) to be provided to patients due for CRC screening

- Utilize the electronic medical record (EMR) to support practice and system level interventions ie. health maintenance records to identify patients due for screenings during pre-visit planning and intake, provider reminders, and updating patient records with screening dates and results
- Conduct morning huddles to provide provider/staff reminders
- Provide care coordination and referral services to assist patients with referral management, follow-up, closing the loop, and removing barriers ie. transportation, referral assistance, and prior authorization
- Monitor and track performance inorder to provide feedback to staff on practice performance for CRC screening rate
- Post CRC screening posters in exam room and waiting area

Provider-Level

- Provide providers with educational material related to changes in screening recommendations
- Provider to adopt standardized, evidence-based protocols for CRC screening.
- Provider to assess EMR prompts, Health Maintenance, and/or MA/Nurse prompts for patients who are in need of CRC screening.
- Provider communicates with patient/family about risk factors and screening options (FIT testing annually or colonoscopy every 10 years) making appropriate recommendation using standard patient decision making tool if needed
- Provider supports patient decision and encourages compliance
- Provider to initiate referral and communicate with MA/Nurse/Referral Coordinator for follow up
- Provider explains next steps to patient ie. consult with GI specialist prior to scheduling colonoscopy and bowel prep for colonoscopy.
- Provider to assess for potential barriers and communicate to care team for care coordination and navigation services.
- Provider to set reminders within EMR for follow up with patient.
- Provider letters sent to patients due for screening, or who have not returned FIT test

Patient-Level

- Patient educational material provided to patients due for CRC screening including a video link for CRC and screening options while in the office if possible or mailed to home
- Patient reminders sent via phone call, text, or letter to patients identified as due for CRC screening or needing returned FIT test
- Follow up with patients who were given colonoscopy referral or FIT test kit and have not returned the kit or completed the colonoscopy after one month, and continue to follow up if not returned or completed every month for up to 3 months after the initial kit or referral given with phone call, text, or letter. Phone call or personal contact preferred.
- Patient reminder calls made for patient appointments
- Patient outreach and navigation services provided as needed to assist with barriers such as transportation, bowel prep, and insurance authorization.

This guideline will be updated based on the organization policy of at least annually and no longer than every 3 years. All work produced in this guideline is free from bias due to competing interests.

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ADDITIONAL DOCUMENTS

1. CRC Protocol with Staff Roles
2. Patient Educational Material with links to video
3. FIT Test Instructions
4. Patient Reminder Letters
5. Decision Making Tool (Choosing the Right Test)
6. CRC Screening Recommendations (Clinician Summary)

APPROVAL

NAME AND CREDENTIALS [Name and Credentials] TITLE [Title]	NAME AND CREDENTIALS [Name and Credentials] TITLE [Title]	
SIGNATURE		DATE [MM/DD/YYYY]
SIGNATURE		DATE [MM/DD/YYYY]

Appendix G: Colorectal Cancer Screening Protocol with Staff Roles

Medical Assistant/Nurse

- Review health maintenance record during intake at every visit and during pre-visit planning to identify patients due for screening
- Alert provider that patient is due for CRC screening
- For patients due for CRC screening, provide CRC screening educational material, and video to view while waiting for provider or other appropriate time during the visit as needed (Refer to educational material at the end of this protocol in Appendix H).
- Update record as needed with CRC screening dates and results
- Collaborate with provider to provide after visit education and instructions regarding CRC screening recommendation, referral, and next steps
- Communicate and collaborate with referral coordinator as needed for scheduling of GI consult and colonoscopy for the patient
- Provide patient with FIT test and instructions for collection and return. (FIT test instructions can be viewed in the educational material located in Appendix H).).
- Complete FIT test log to track patient completion, returns, and results
- Provide patient reminders for FIT tests via phone call, text, or patient letters if not returned in 1 month. See sample letters in Appendix I. Continue to provide reminders monthly up to 3 months after initial kit given. Phone calls or in person reminders preferred after initial reminder.
- Communicate and collaborate with GI specialist and MA/Nurse post-visit to schedule colonoscopy if ordered and provide patient with instructions as needed
- Provide patient reminders for appointments via phone or text
- Review current education regarding importance of CRC screening, impact of disease, and screening recommendations

Referral Coordinator

- Receive referrals from practice and schedule appointment with GI specialist for colonoscopy consult as needed
- Follow up with patients per referral policy
- Provide assistance with scheduling transportation as needed
- Communicate and collaborate with GI specialist and MA/Nurse post-visit to schedule colonoscopy if ordered and provide patient with instructions as needed
- Provide patient reminders for colonoscopies via phone call, text, or patient letters. See sample letters in Appendix I.
- Follow up with patient if appointment missed to reschedule and identify reason for missed appointment.
- Track and close loop of referrals by ensuring completion of the referral and obtaining the results for record to be sent to referring provider.
- Collaborate and communicate with provider and care team to provide patient reminders, patient outreach and navigation services.
- Understand insurance requirements for most common insurances for the practice

Provider

- Review Health Maintenance record during visit with each patient to identify patient due for CRC screening
- Educate patient/family on importance of CRC screening, discuss risk factors, and discuss recommended CRC screening options (i.e., annual FIT test, and colonoscopy every 10 years).
- Make appropriate recommendation using standard patient decision making tool if needed (contained in the educational material found in Appendix H).
- Ensure shared decision making in which provider and patient share information and reach consensus about what screening test is best for the patient
- Provide after visit instructions
- Provide patient follow up for results
- Collaborate with care team to provide patient reminders and patient outreach via phone or letters
- Obtain updated screening recommendations (contained in the educational material located in Appendix H).
- Review current education regarding importance of CRC screening, impact of disease, and screening recommendations

Administration/Management

- Ensure that all staff and new employees are oriented to guideline for CRC screening and trained for adequate EMR documentation.
- Ensure that all staff has reviewed current education regarding importance of CRC screening, impact of disease, and screening recommendations.
- Ensure guideline is being followed.
- Provide provider assessments and feedback of performance on CRC screening rate.

Appendix H: Educational Packet for Colorectal Cancer Screening

COLORECTAL CANCER SCREENING

Screen for life

What Is Colorectal Cancer?

Colorectal cancer is cancer that occurs in the colon or rectum. Sometimes it is called colon cancer. The colon is the large intestine or large bowel. The rectum is the passageway that connects the colon to the anus.

Screening Saves Lives

Colorectal cancer is the second leading cancer killer in the United States, but it doesn't have to be. If you are 50 or older, getting a colorectal cancer screening test could save your life. Here's how:

- Colorectal cancer usually starts from precancerous polyps in the colon or rectum. A polyp is a growth that shouldn't be there.
- Over time, some polyps can turn into cancer.
- Screening tests can find precancerous polyps, so they can be removed before they turn into cancer.
- Screening tests also can find colorectal cancer early, when treatment works best.

Who Gets Colorectal Cancer?

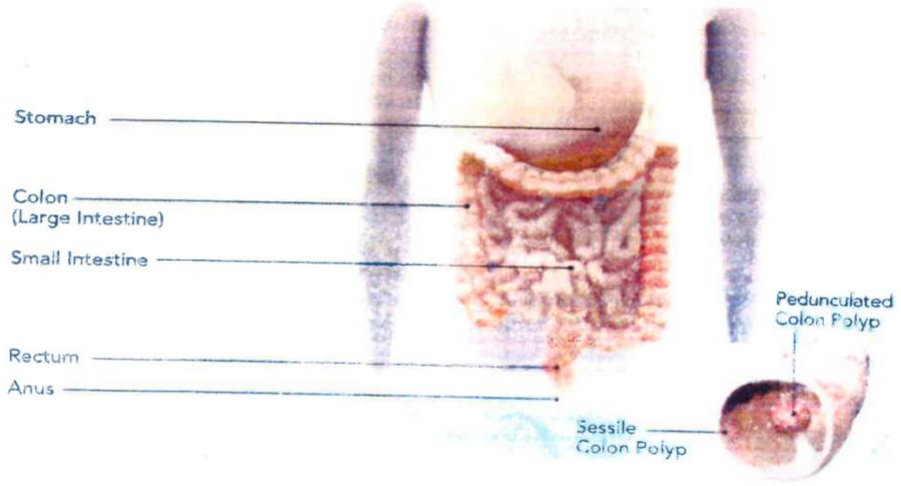
- Both men and women can get it.
- It is most often found in people 50 or older.
- The risk increases with age.

Are You at Increased Risk?

Your risk for colorectal cancer may be higher than average if:

- You or a close relative have had colorectal polyps or colorectal cancer.
- You have inflammatory bowel disease, Crohn's disease, or ulcerative colitis.
- You have a genetic syndrome such as familial adenomatous polyposis (FAP) or hereditary nonpolyposis colorectal cancer.

People at increased risk for colorectal cancer may need earlier or more frequent tests than other people. Talk to your doctor about when to begin screening, which test is right for you, and how often you should be tested.



Colorectal Cancer Can Start With No Symptoms

Precancerous polyps and early-stage colorectal cancer don't always cause symptoms, especially at first. This means that someone could have polyps or colorectal cancer and not know it. That is why having a screening test is so important.

What Are the Symptoms?

Some people with colorectal polyps or colorectal cancer do have symptoms. They may include:

- Blood in or on your stool (bowel movement).
- Stomach pain, aches, or cramps that don't go away.
- Losing weight and you don't know why.

If you have any of these symptoms, talk to your doctor. They may be caused by something other than cancer. However, the only way to know is to see your doctor.

Types of Screening Tests

The U.S. Preventive Services Task Force recommends that adults aged 50–75 be screened for colorectal cancer. The decision to be screened after age 75 should be made on an individual basis. If you are aged 76-85, ask your doctor if you should be screened.

Several different screening tests can be used to find polyps or colorectal cancer. They include:

Stool Tests

Guaiac-based Fecal Occult Blood Test (gFOBT): uses the chemical guaiac to detect blood in stool. At home you use a stick or brush to obtain a small amount of stool. You return the test to the doctor or a lab, where stool samples are checked for blood.

Fecal Immunochemical Test (FIT): uses antibodies to detect blood in the stool. You receive a test kit from your health care provider. This test is done the same way as gFOBT.

FIT-DNA Test (or Stool DNA test): combines the FIT with a test to detect altered DNA in stool. You collect an entire bowel movement and send it to a lab to be checked for cancer cells.

How Often: gFOBT Once a year. FIT Once a year. FIT-DNA once every one or three years.

Flexible Sigmoidoscopy

For this test, the doctor puts a short, thin, flexible, lighted tube into your rectum. The doctor checks for polyps or cancer inside the rectum and lower third of the colon.

How Often: Every five years, or every 10 years with a FIT every year.

Colonoscopy

Similar to flexible sigmoidoscopy, except the doctor uses a longer, thin, flexible, lighted tube to check for polyps or cancer inside the rectum and the entire colon. During the test, the doctor can find and remove most polyps and some cancers. Colonoscopy also is used as a follow-up test if anything unusual is found during one of the other screening tests.

How Often: Every 10 years.

CT Colonography (Virtual Colonoscopy)

Computed tomography (CT) colonography, also called a virtual colonoscopy, uses X-rays and computers to produce images of the entire colon. The images are displayed on a computer screen for the doctor to analyze.

How Often: Every five years.

Which Test is Right for You?

There is no single "best test" for any person. Each test has advantages and disadvantages. Talk to your doctor about which test or tests are right for you and how often you should be screened.

Free or Low-Cost Screening

Colorectal cancer screening tests may be covered by your health insurance policy without a deductible or co-pay. Where feasible, CDC's Colorectal Cancer Control Program grantees provides free or low-cost screenings to eligible men and women. To find out more visit www.cdc.gov/cancer/crccp/contact.htm.

The Bottom Line

If you're 50 or older, talk with your doctor about getting screened. For more information, visit www.cdc.gov/screenforlife or call 1-800-CDC-INFO (1-800-232-4636). For TTY, call 1-888-232-6348.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Screen for life
National Colorectal Cancer Action Campaign

www.cdc.gov/screenforlife
1-800-CDC-INFO

CDC Publication #99-6949, Revised April 2017

Screen for life
National Colorectal Cancer Action Campaign

RISK FACTORS & SYMPTOMS

Colorectal Cancer Screening Saves Lives

Risk Factors

People at increased risk for colorectal cancer may need to start screening at an earlier age and get tested more frequently than other people.

You may be at increased risk if:

- You or a close relative have had colorectal polyps or colorectal cancer.
- You have inflammatory bowel disease, Crohn's disease, or ulcerative colitis.
- You have certain genetic syndromes, like familial adenomatous polyposis (FAP) or hereditary non-polyposis colorectal cancer (also known as Lynch syndrome).

Getting screened for colorectal cancer as recommended can reduce your risk for developing this disease. Screening finds precancerous polyps so they can be removed before they turn into cancer. If you are 50 or older, talk to your doctor about getting screened.

Symptoms

Don't wait for symptoms to be tested for colorectal cancer. Precancerous polyps and early-stage colorectal cancer don't always cause symptoms.

But if there are symptoms, they may include:

- Blood in or on your stool (bowel movement).
- Pains, aches, or cramps in your stomach that do not go away.
- Losing weight and you don't know why.

They may be caused by something other than cancer, but the only way to know is to see your doctor. If you have any of these symptoms, talk to your doctor.

CDC
U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

www.cdc.gov/screenforlife
1-800-CDC-INFO

CDC Publication #21-1029, February 2017

Important Facts for African Americans about Colorectal Cancer

- The rate of being diagnosed with colorectal cancer is higher among African Americans than among any other population group in the U.S.
- Death rates from colorectal cancer are higher among African Americans than any other population group in the U.S.
- Experts suggest that African Americans get screened beginning at 45
- There is evidence that African Americans are less likely than Caucasians to get screened for colorectal cancer
- African Americans are more likely to be diagnosed with colorectal cancer in advanced stages when there are fewer treatment options available. They are less likely to live 5 or more years after being diagnosed with colorectal cancer than other populations.
- Diet, tobacco use and lack of access to equal medical treatment options may increase African Americans' risk of developing colorectal cancer.
- There may also be genetic factors that contribute to the higher incidence of colorectal cancer among some African Americans. Learn your family's medical history and tell your primary care provider if a relative (parent, brother, sister or child) has had colorectal cancer or colorectal polyps.
- African American women are more likely to die of colorectal cancer than are women of any other population group.
- African American patients experience a larger number of polyps on the right side of the colon, versus the left. A screening endoscopy must cover the entire colon, as is performed with a colonoscopy.

Reference

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FIT Test

- FIT test is an investigation looking for the presence of blood in your stool (poo) where it is in too small amount to be seen.
- FIT uses antibodies which specifically react to human hemoglobin protein, which is found in red blood cells.
- You will collect a small amounts of stool (poo).
- It is important to note that if there is a positive result you will require a colonoscopy to investigate further
- If you and your doctor choose to do the FIT test you will need to repeat it every year

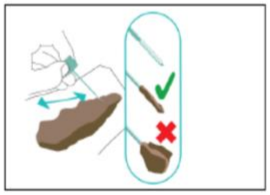
1. Label your sample

Write your **NAME**, **DATE OF BIRTH** and the **DATE** you collected your stool (poo) where indicated using a black or blue pen. If the label already has your details on it please check they are correct.

2. How to catch the stool (poo) sample

It is important that your stool (poo) sample does not touch the toilet water.

3. Take a sample of your stool (poo) with the extraction device



Unscrew the top of the sample tube anti-clockwise, remove the stick and **scrape the end of the stick along the stool (poo)**. Only a very small amount of the stool (poo) is needed on the stick.

Put the stick with your poop back into the FIT tub. Snap the FIT tube closed.

4. Close and seal the container

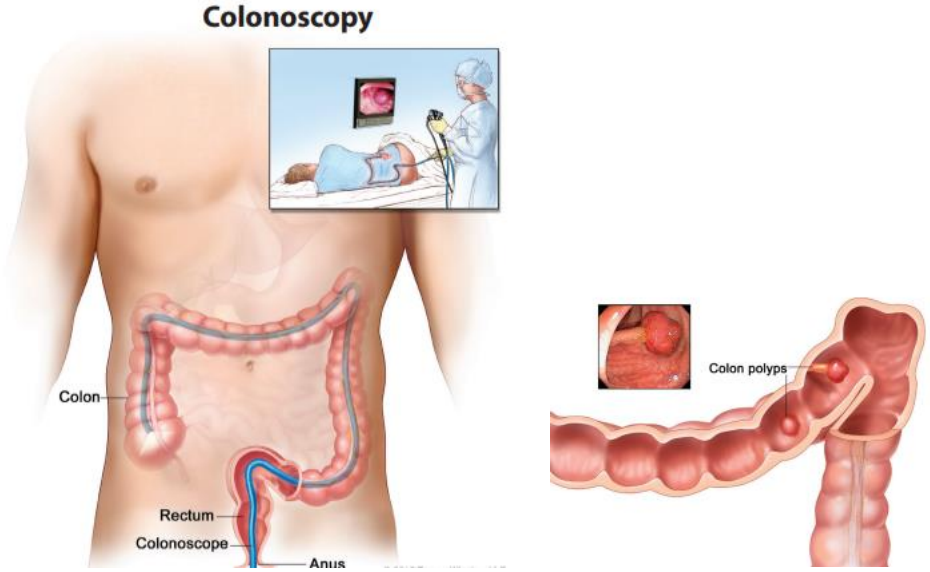
Replace the sample stick back into the tube. Make sure that the tube clicks closed and place it in the plastic bag.

Don't forget to wash your hands!

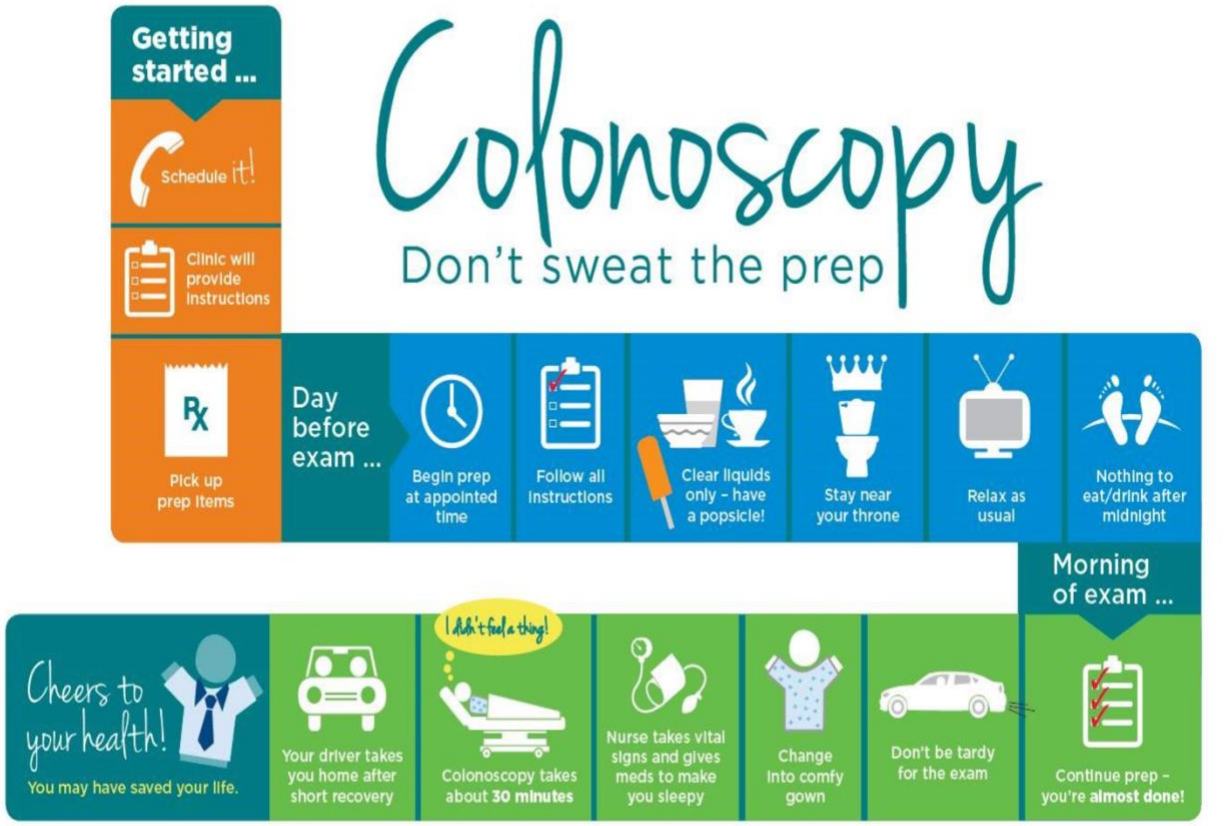
5. Hand in your sample

Take your sample to your doctors office or drop off in mail. Its best to mail or drop off sample within 2 days of collecting it.

You Are Finished!



- Colonoscopy is an examination of the large intestines (colon)
- It is used to screen for colorectal cancer and also used as a follow up test if anything unusual is found during one of the other screening tests like the FIT test
- Before the test you need to pick up a prep prescribed by your doctor and start the day before
- You will receive medication during the test to make you comfortable
- The doctor will use a flexible lighted tube to check for polyps or cancer inside your rectum and entire colon
- During the test the doctor can find and remove most polyps and some cancers
- This test should be done every 10 years.
- If polyps or cancers are found during the test, you will need more frequent colonoscopies in the future


Getting started ...
Schedule it!
Clinic will provide instructions
Pick up prep items
Colonoscopy
Don't sweat the prep
Day before exam ...
Begin prep at appointed time
Follow all instructions
Clear liquids only – have a popsicle!
Stay near your throne
Relax as usual
Nothing to eat/drink after midnight
Morning of exam ...
Cheers to your health!
You may have saved your life.
Your driver takes you home after short recovery
I didn't feel a thing!
Colonoscopy takes about 30 minutes
Nurse takes vital signs and gives meds to make you sleepy
Change into comfy gown
Don't be tardy for the exam
Continue prep – you're almost done!

Colorectal Cancer (CRC) Quiz and Answer Key

1. Who gets colorectal cancer?
   a)Men only b)women only c)both men and women

   The correct answer is:
   Both men and women
   Colorectal cancer affects men and women of all racial and ethnic groups.

2. Colorectal cancer is the second leading cancer killer in the United States
   True or False

   The correct answer is:
   True
   Of cancers affecting both men and women, colorectal cancer is the second leading cancer killer in the United States and the third most common cancer in men and in women.
3. Getting screened for colorectal cancer can help you prevent the disease.
   True or False

   The correct answer is:
   True
   Screening helps find precancerous polyps (abnormal growths) in the colon and rectum so they can be removed before they turn into cancer. Screening also helps find colorectal cancer early, when treatment works best.

4. If you don't have any symptoms, it means you don't have colorectal cancer.
   True or False

   The correct answer is:
   False
   Colorectal polyps and colorectal cancer don't always cause symptoms, especially early on. But screening can find polyps and colorectal cancer even before symptoms appear. That is why getting screened regularly for colorectal cancer is so important.

5. Screening is recommended to begin at what age?
   a)40, b)50, c)60, d)70

   The correct answer is:
   50
   Your risk of getting colorectal cancer increases as you get older. About 90% of cases occur in people who are age 50 or older. However, you may need to be tested earlier or more often than other people if you have inflammatory bowel disease such as Crohn's disease or ulcerative colitis, a personal or family history of colorectal cancer or colorectal polyps, or a genetic syndrome such as familial adenomatous polyposis (FAP) or hereditary non-polyposis colorectal cancer (Lynch syndrome). If you think any of these things is true for you, ask your doctor when and how often you should be tested. The American Cancer Society recommends lowering the age to 45 years.

6. At what age can you stop getting screened for colorectal cancer?

a)60, b)65, c)70, d)75, e)80

The correct answer is:
75
Regular screening is recommended for adults ages 50 to 75. If you are between 76 and 85, ask your doctor if you should be screened.

7. The only screening test for colorectal cancer is colonoscopy.
   True or False

   The correct answer is:
   False
   There are several types of screening tests for colorectal cancer, including some that you can do at home. Learn about all of the screening test options and talk to your doctor about which is right for you. The best test is the one you do!

8. Which of these are symptoms of colorectal cancer?
   a)Blood in stool or bowel movement,
   b)Stomach pain, aches, or cramps that don't go away
   c)Losing weight and you don't know why
   d)All of these
   e)None of these

   The correct answer is:
   All of these
   If you have any of these symptoms, talk to your doctor. They may be caused by something other than cancer. The only way to know what is causing them is to see your doctor.
9. Medicare and most insurance plans cover colorectal cancer screening.
   True or False

   The correct answer is: True
   Check with your plan to see what is covered. In addition, free or low-cost screenings may be available for you. Six states in CDC's Colorectal Cancer Control Program provide colorectal cancer screening to low-income men and women aged 50 to 64 years who are underinsured or uninsured for screening, when resources are available, and there is no other payment option.

Video Links

*Colorectal cancer screening promotion for African Americans - video 1 - YouTube https://youtu.be/HeA7KgSQRtA (2:20)

Chadwick Boseman's private struggle with colon cancer | 20/20 (facebook.com) https://www.facebook.com/ABC2020/videos/1209469029419693/ (5:48 – 3:23 to 5:30)

*What happens during and after a colonoscopy? - YouTube https://www.youtube.com/watch?v=mh90RPA-C10 (5:14)

CDC: Tips From Former Smokers - Asaad M. and Leah M.: We're a Team - YouTube https://www.youtube.com/watch?app=desktop&v=SQk6IIL_bGM (1:21)

Figure 1. Clinician Summary: Screening for Colorectal Cancer

What does the USPSTF recommend?	**For adults aged 50 to 75 years:** **Screen** all adults aged 50 to 75 years for colorectal cancer. Grade A
	For adults aged 45 to 49 years: **Screen** adults aged 45 to 49 years for colorectal cancer. Grade B
	For adults aged 76 to 85 years: **Selectively screen** adults aged 76 to 85 years for colorectal cancer, considering the patient's overall health, prior screening history, and patient's preferences. Grade C
To whom does this recommendation apply?	Adults 45 years or older who do not have signs or symptoms of colorectal cancer and who are at average risk for colorectal cancer (ie, no prior diagnosis of colorectal cancer, adenomatous polyps, or inflammatory bowel disease; no personal diagnosis or family history of known genetic disorders that predispose them to a high lifetime risk of colorectal cancer [such as Lynch syndrome or familial adenomatous polyposis]).
What's new?	The USPSTF expanded the recommended ages for colorectal cancer screening to 45 to 75 years (previously, it was 50 to 75 years). The USPSTF continues to recommend selectively screening adults aged 76 to 85 years for colorectal cancer.
How to implement this recommendation?	**Screen all adults aged 45 to 75 years** for colorectal cancer. Several recommended screening tests are available. Clinicians and patients may consider a variety of factors in deciding which test may be best for each person. For example, the tests require different frequencies of screening, location of screening (home or office), methods of screening (stool-based or direct visualization), preprocedure bowel preparation, anesthesia or sedation during the test, and follow-up procedures for abnormal findings. Recommended screening strategies include • High-sensitivity guaiac fecal occult blood test (HSgFOBT) or fecal immunochemical test (FIT) every year • Stool DNA-FIT every 1 to 3 years • Computed tomography colonography every 5 years • Flexible sigmoidoscopy every 5 years • Flexible sigmoidoscopy every 10 years + annual FIT • Colonoscopy screening every 10 years **Selectively screen adults aged 76 to 85 years for colorectal cancer.** • Discuss together with patients the decision to screen, taking into consideration the patient's overall health status (life expectancy, comorbid conditions), prior screening history, and preferences.
What are other relevant USPSTF recommendations?	The USPSTF has made a recommendation statement on aspirin use to prevent cardiovascular disease and colorectal cancer available at https://www.uspreventiveservicestaskforce.org
Where to read the full recommendation statement?	Visit the USPSTF website (https://www.uspreventiveservicestaskforce.org) to read the full recommendation statement. This includes more details on the rationale of the recommendation, including benefits and harms; supporting evidence; and recommendations of others.

The USPSTF recognizes that clinical decisions involve more considerations than evidence alone. Clinicians should understand the evidence but individualize decision-making to the specific patient or situation.

USPSTF indicates US Preventive Services Task Force.

Information can be found at https://www.uspreventiveservicestaskforce.org/uspstf/document/ClinicalSummaryFinal/colorectal-cancer-screening

Table 1. Characteristics of Recommended Colorectal Cancer Screening Strategies

Screening method[a]	Frequency[b]	Evidence of efficacy	Other considerations
Stool-based tests			
High-sensitivity gFOBT	Every year	• Evidence from RCTs that gFOBT reduces colorectal cancer mortality • High-sensitivity versions (eg, Hemoccult SENSA) have superior test performance characteristics than older tests (eg, Hemoccult II), although there is still uncertainty about the precision of test sensitivity estimates. Given this uncertainty, it is unclear whether high-sensitivity gFOBT can detect as many cases of advanced adenomas and colorectal cancer as other stool-based tests	• Harms from screening with gFOBT arise from colonoscopy to follow up abnormal gFOBT results • Requires dietary restrictions and 3 stool samples • Requires good adherence over multiple rounds of testing • Does not require bowel preparation, anesthesia or sedation, or transportation to and from the screening examination (test is performed at home)
FIT	Every year	• Evidence from 1 large cohort study that screening with FIT reduces colorectal cancer mortality • Certain types of FIT have improved accuracy compared to gFOBT and HSgFOBT (20 μg hemoglobin per gram of feces threshold was used in the CISNET modeling)	• Harms from screening with FIT arise from colonoscopy to follow up abnormal FIT results • Can be done with a single stool sample • Requires good adherence over multiple rounds of testing • Does not require bowel preparation, anesthesia or sedation, or transportation to and from the screening examination (test is performed at home)
sDNA-FIT	Every 1 to 3[c] y	• Improved sensitivity compared with FIT per 1-time application of screening test • Specificity is lower than that of FIT, resulting in more false-positive results, more follow-up colonoscopies, and more associated adverse events per sDNA-FIT screening test compared with per FIT test • Modeling suggests that screening every 3 y does not provide a favorable (ie, efficient) balance of benefits and harms compared with other stool-based screening options (ie, annual FIT or sDNA-FIT every 1 or 2 y) • Insufficient evidence about appropriate longitudinal follow-up of abnormal findings after a negative follow-up colonoscopy • No direct evidence evaluating the effect of sDNA-FIT on colorectal cancer mortality	• Harms from screening with sDNA-FIT arise from colonoscopy to follow up abnormal sDNA-FIT results • Can be done with a single stool sample but involves collecting an entire bowel movement • Requires good adherence over multiple rounds of testing • Does not require bowel preparation, anesthesia or sedation, or transportation to and from the screening examination (test is performed at home)
Direct visualization tests			
Colonoscopy	Every 10 y	• Evidence from cohort studies that colonoscopy reduces colorectal cancer mortality • Harms from colonoscopy include bleeding and perforation, which both increase with age	• Screening and follow-up of positive results can be performed during the same examination • Requires less frequent screening • Requires bowel preparation, anesthesia or sedation, and transportation to and from the screening examination
CT colonography	Every 5 y	• Evidence available that CT colonography has reasonable accuracy to detect colorectal cancer and adenomas • No direct evidence evaluating effect of CT colonography on colorectal cancer mortality • Limited evidence about the potential benefits or harms of possible evaluation and treatment of incidental extracolonic findings, which are common. Extracolonic findings detected in 1.3% to 11.4% of examinations; <3% required medical or surgical treatment	• Additional harms from screening with CT colonography arise from colonoscopy to follow up abnormal CT colonography results • Requires bowel preparation • Does not require anesthesia or sedation or transportation to and from the screening examination
Flexible sigmoidoscopy	Every 5 y	• Evidence from RCTs that flexible sigmoidoscopy reduces colorectal cancer mortality • Risk of bleeding and perforation but less than risk with colonoscopy • Modeling suggests that it provides fewer life-years gained alone than when combined with FIT or in comparison to other strategies	• Additional harms may arise from colonoscopy to follow up abnormal flexible sigmoidoscopy results • Test availability has declined in the US but may be available in some communities where colonoscopy is less available
Flexible sigmoidoscopy with FIT	Flexible sigmoidoscopy every 10 y plus FIT every year	• Evidence from RCTs that flexible sigmoidoscopy + FIT reduces colorectal cancer mortality • Modeling suggests combination testing provides benefits similar to those of colonoscopy, with fewer complications • Risk of bleeding and perforation from flexible sigmoidoscopy but less than risk with colonoscopy	• Additional potential harms from colonoscopy to follow up abnormal flexible sigmoidoscopy or FIT results • Flexible sigmoidoscopy availability has declined in the US but may be available in some communities where colonoscopy is less available • Screening with FIT requires good adherence over multiple rounds of testing

Abbreviations: CISNET, Cancer Intervention and Surveillance Modeling Network; CT, computed tomography; FIT, fecal immunochemical test; gFOBT, guaiac fecal occult blood test; RCT, randomized clinical trial; sDNA-FIT, stool DNA test with fecal immunochemical test.

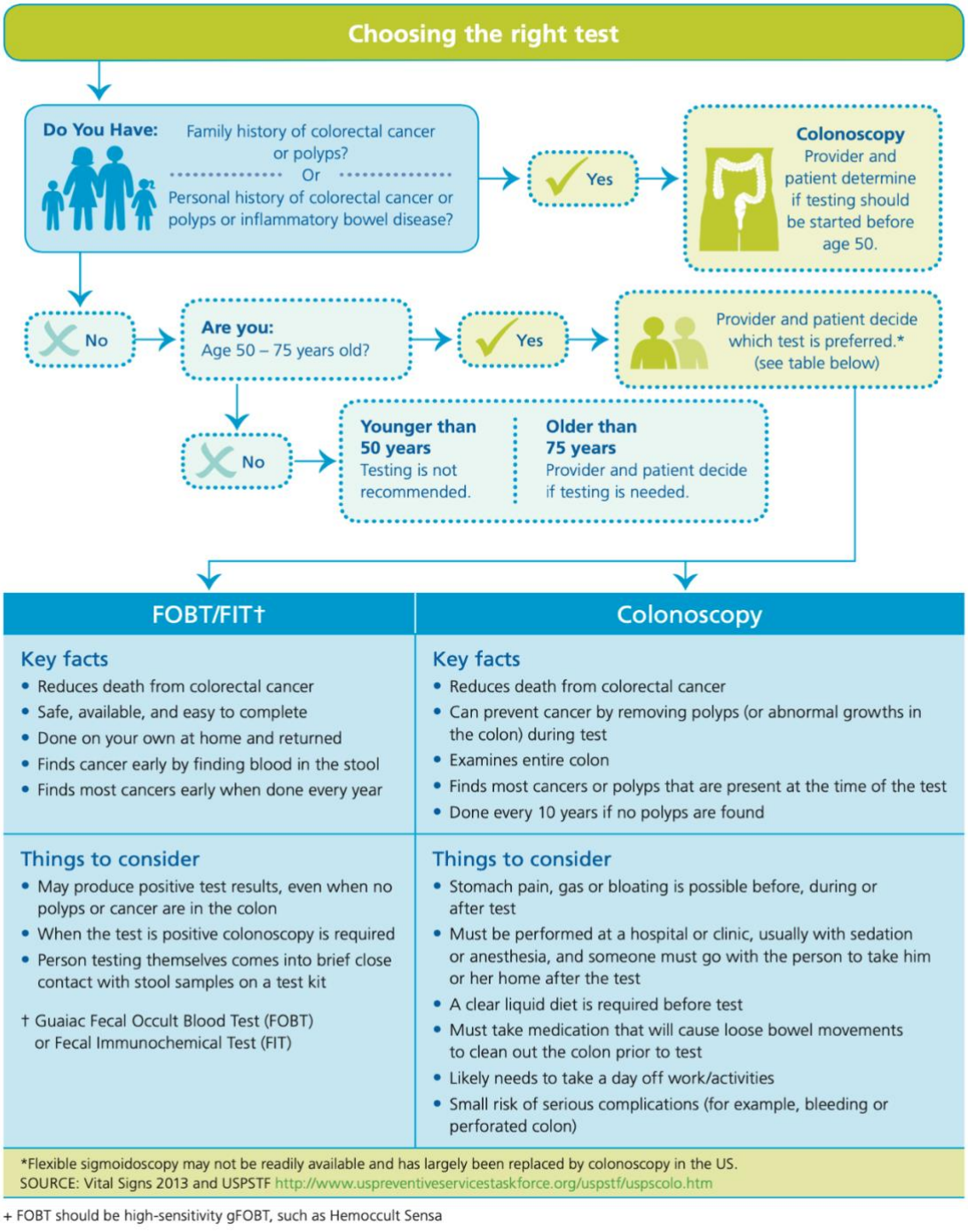
[a] To achieve the benefits of screening, abnormal results from stool-based tests, CT colonography, and flexible sigmoidoscopy should be followed up with colonoscopy.

[b] Applies to persons with negative findings (including hyperplastic polyps) and is not intended for persons in surveillance programs. Evidence of efficacy is not informative of screening frequency, with the exception of gFOBT and flexible sigmoidoscopy alone.

[c] As stated by the manufacturer.

Information can be found at https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/colorectal-cancer-screening

Figure 2. Choosing the Right Test



Information can be found at https://www.aachc.org/wp-content/uploads/2015/05/Steps-for-Increasing-Colorectal-Cancer-Screening-Rates.pdf

Appendix I: Sample FIT test letters

Date_____

Dear _____

On your last visit to your healthcare provider, _____, you were given a test to screen for colorectal cancer.

At this time, we have not received your test back.

Colorectal cancer is treated most successfully when found in the early stages. Simple tests like having a stool test every year can help find cancer early.

Please return your completed test kit to us as soon as possible.

If you have any questions about your test, please call _____ at

_____

Sincerely,

Your healthcare provider

2000 West Baltimore Street
Baltimore, Maryland 21223
410-362-3612

Date_____

Dear _____

A year ago, you did a test to check for colon cancer. Your test was normal.
But, colon cancer can start any time. And when cancer is starting, you do not feel anything. To protect yourself from colon cancer, you need to do this test every year. It is time to do the test again. The test checked for hidden blood in your stool, which is a sign of colon cancer. Last time, you put some stool (poop) into a tube and you will do the same again this year. The test is easy, you can eat whatever food you want to eat before the test.

We have sent you the test kit with this letter. Just follow the instructions. Mail it to the lab, or drop it off to us as soon as you have done the test. The test and the postage is free.

This simple test could save you life. Do it and send it in right away!

If you have any questions about your test, please call at

_____

Sincerely,

Your healthcare provider

2000 West Baltimore Street
Baltimore, Maryland 21223
410-362-3612

Date_____

Dear _____

Our office has made a commitment to promote the health of its members, and to provide education regarding preventive health measures that you can take to maintain a healthy lifestyle. Our records indicate that you are either overdue for colorectal cancer screening tests, or that you have never had a colorectal cancer screening test.

I am writing to ask you to call our office today to schedule a colorectal cancer screening appointment. By getting colorectal cancer screening tests regularly, colorectal cancer can be found and treated early when the chances for cure are best. Many of these tests can also help prevent the development of colorectal cancer.

The American Cancer Society recommends that you have this screening at the age of 45.

This test could save your life!

If you have any questions and to schedule your appointment, please call my office at

_____

Sincerely,

_____

2000 West Baltimore Street
Baltimore, Maryland 21223
410-362-3612