

**DNP Project Proposal: Nurse Practitioners' Knowledge and Behaviors in Recommending  
Colorectal Cancer Screening**

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**Table of Contents**

Abstract .....	3
Background .....	4
Problem Statement .....	7
Organizational “Gap” Analysis of Project Site.....	8
Review of Literature .....	9
Theoretical Framework.....	14
Goals, Objectives and Expected Outcomes .....	16
Project Design/Methods.....	16
Data Collection .....	18
Ethical Considerations/Protection of Human Subjects .....	19
Data Analysis and Results .....	20
Conclusion .....	28
References.....	29
Appendix A.....	34
Appendix B.....	39
Appendix C .....	41
Appendix D.....	43

### **Abstract**

The United States Preventative Services Task Force (USPSTF) recommends initiating colorectal cancer screening for asymptomatic, average-risk individuals at age 45, which is a new update to the previous recommendation of age 50. Early detection of colorectal cancer reduces mortality compared to treatment in advanced stages of disease. Strategies shown to increase screening rates include the discussion of multiple modalities for screening, a systematic approach to identifying eligible patients, healthcare provider recommendation and teaching for screening, and overcoming individualized patient barriers to screening. This project was conducted in partnership with the Coalition of Advanced Practice Registered Nurses of Indiana (CAPNI) to better understand the knowledge and recommendation practices of Indiana nurse practitioners. A survey based on a previous study of primary care physicians by Chapman et al. (2012) was distributed to CAPNI membership regarding recommendation practices and utilization of screening guidelines. Colonoscopy was the most commonly recommended screening modality, followed by fecal immunoassay testing with DNA testing (FIT-DNA). No statistically significant difference was found in completion rates between colonoscopy and stool-based tests, as reported by providers. Most participants utilized guidelines from a professional organization to guide their recommendations for screening, but only 37.25% utilized those from the USPSTF. The majority of providers indicated they utilized a chart notification system to identify patients for screening and would offer additional modalities for screening if patients declined their first-recommended modality. USPSTF guidelines changed during the implementation of the project, influencing responses. Additional research with a larger sample size may aid in targeted educational opportunities to increase screening.

**Keywords:** colorectal cancer screening, USPSTF, colonoscopy, FIT-DNA, nurse practitioners

## **DNP Project Proposal: Nurse Practitioners' Knowledge and Behaviors in Recommending Colorectal Cancer Screening**

This project is submitted to the faculty of Marian University Leighton School of Nursing as partial fulfillment of degree requirements for the Doctor of Nursing Practice, Family Nurse Practitioner track. A survey was implemented to determine the prevalence of nurse practitioners recommending colorectal cancer screening. Colorectal cancer is the second leading cause of cancer mortality in the United States. Diagnosis is most common in adults aged 65-74 years (United States Preventative Services Task Force [USPSTF], 2016). The United States Preventative Services Task Force [USPSTF] (2021) recommends initiating colorectal cancer screening at age 45 for asymptomatic patients without a family history of colorectal cancer or inherited syndromes. This is a recent update to the recommendation of initiating screening at age 50. Early screening recommendations are based on decreased rates of mortality associated with early detection and treatment compared to detection in advanced disease (Wilkins et al., 2018). Despite the longstanding recommendation of screening initiation at age 50, only 62% of Americans aged 50-75 years are up to date on screenings (Levin et al., 2018). Therefore, an increase in screening in this population is necessary.

### **Background**

Colorectal cancer five-year survival rates for contained, localized disease is 90%, but the rate decreases to only 14% in metastatic colorectal cancer (Montminy et al., 2019). Statistics supporting the benefits of early detection and treatment contributed to a significant increase in screening and decrease in mortality in the United States since the 1990s (Levin et al., 2018). However, screening rates have plateaued in recent years, falling below the national goal of 80% among those aged 50-75 years (Levin et al., 2018). The National Colorectal Cancer Roundtable

estimates achieving national rates of colorectal cancer screening of 80% or greater in this population could reduce colorectal cancer mortality by 19%, saving 203,000 lives by 2030 (Meester et al., 2015; National Colorectal Cancer Roundtable, 2017).

Despite the overall improvements in colorectal cancer screening and mortality rates, racial and socioeconomic disparities remain. Colorectal cancer incidence has decreased among African Americans since 1989, though not as significantly as for Caucasian Americans (Montminy, 2019). Both African American men (52%) and African American women (41%) are more likely to die from colorectal cancer than their respective Caucasian counterparts. This inequality has been attributed, in part, to lower rates of screening among African Americans than Caucasian Americans. Screening rates among African Americans have increased significantly since 2000 from 32% to 61% in 2015, which was comparable to the rate for Caucasian Americans of 65% (Montminy, 2019).

One type of screening recommended by the USPSTF (2021) is colonoscopy. The USPSTF (2021) does not recommend this modality over any other forms of screening, but it has been the most commonly ordered screening test since 2000 (Issa & Nouredine, 2017). Colonoscopy advantages include less frequent testing compared to other modalities and the ability to combine screening and diagnostic follow-up in one procedure (USPSTF, 2016). Despite its common use, characteristics and risks of colonoscopy are unappealing, including the discomfort of bowel preparation, cardiovascular risks during sedation, and the risk of bleeding or bowel perforation (USPSTF, 2021). These disadvantages may be barriers to colorectal cancer screening if other screening options are not discussed.

The USPSTF (2021) also recommends stool-based testing, such as guaiac-based fecal occult blood testing (gFOBT), fecal immunoassay testing (FIT), and FIT with DNA testing (FIT-

DNA), as appropriate screening tests for colon cancer. Providers should emphasize the importance of screening and discuss all screening modalities available; thus, making a collaborative decision with the patient. The American Cancer Society (2017) recommends providers offer options for screening tests because patients who choose their own modality are more likely to adhere to screening recommendations.

The recommended screening options do not vary significantly in the number of preventable colorectal cancer deaths, with 20-24 per 1000 people for all methods of screening (Wilkins et al., 2018). The test with the lowest sensitivity and specificity is gFOBT, with a sensitivity of 62-79% and a specificity of 87-96% (Wilkins et al., 2018). Furthermore, gFOBT only detects lesions which are actively bleeding. Therefore, the recommendation is for three consecutive stool samples to be tested in order to reduce false negative results (Elfant, 2015). FIT testing offers a sensitivity of 73-88% and a specificity of 91-95% (Wilkins et al., 2018). Compared to FIT alone, FIT-DNA demonstrates 92% sensitivity but only 90% specificity (Wilkins et al., 2018). The sensitivity and specificity of the colonoscopy is divided into two categories: the detection of adenomas greater than, equal to 6 millimeters and those greater than, or equal to 10 millimeters. For adenomas greater than or equal to 6 millimeters, colonoscopy has a sensitivity of 72.7%-98% and a specificity of 79.6%-93.1% (Ladabaum et al., 2020). When considering the detection of adenomas 10 millimeters or larger, colonoscopy has a sensitivity of 66.7%-93.5% and a specificity of 96%-97.9% (Ladabaum et al., 2020). The range of sensitivities and specificities for each of these screening modalities does not identify a clear best test. Thus, benefits and risks of all screening options should be discussed with the patient for an informed decision to be made.

Cost may also act as a barrier to colorectal cancer screening. In 2018, nearly 28 million

Americans under age 65 were uninsured, with the cost of insurance cited as the most common reason for lacking insurance coverage (Tolbert et al., 2019). Those who lack insurance are less likely to receive preventative healthcare than those with insurance coverage, and earlier-stage cancer detection is associated with having insurance (Tolbert et al., 2019). Lack of insurance coverage is a major barrier to colorectal cancer screening (American Cancer Society, 2020). Similarly, out-of-pocket costs are a barrier for those with insurance coverage. Colorectal cancer screening is typically considered preventative. However, a screening colonoscopy may not be billed as preventative if a polypectomy or biopsy is performed. Therefore, the colonoscopy could be coded as diagnostic or therapeutic thus requiring the patient to pay a higher proportion of charges for services. Furthermore, additional follow-up appointments may also be billed at this increased rate (Montminy et al., 2018).

Early detection of colorectal cancer is key in reducing mortality. Less than ideal screening rates and possible barriers to screening support further assessment of patient or provider beliefs, behaviors, or characteristics influencing screening rates. Targeting specific barriers for a specific population may be more effective than generalizing previous findings.

### **Problem Statement**

The population of interest for this quality improvement project is nurse practitioners working in primary care settings in Indiana caring for patients 50-75 years of age. This group of nurse practitioners is of interest because of their role in recommending and ordering colorectal screening tests for asymptomatic patients at average risk for colorectal cancer. It is important to understand providers' knowledge and behaviors regarding colorectal cancer screening. The findings will be compared to the current guidelines for colorectal cancer screening from the USPSTF. Does a survey of Indiana nurse practitioners caring for adults aged 50-75 years

regarding colorectal cancer screening recommendation practices compared to screening practices recommended in the literature result in knowledge of areas for improvement?

### **Organizational “Gap” Analysis of Project Site**

This project will be implemented in partnership with the Coalition of Advanced Practice Registered Nurses of Indiana (CAPNI), a professional organization for Indiana advanced practice registered nurses (APRNs). CAPNI members include nurse practitioners in primary care, which is the population of interest for this project. Ascertaining nurse practitioners’ knowledge and behaviors related to colorectal cancer screening is integral to identifying potential areas for future research and interventions to improve colorectal cancer screening rates. CAPNI’s membership provides an ideal representation of nurse practitioners in Indiana for this project.

### **Search Methodology**

The literature search was conducted using only PubMed because of accessibility, which may have limited the overall results. Search terms utilized for this search included *colorectal cancer screening recommendation*, *colorectal cancer screening provider*, and *colorectal cancer screening barrier*. Limiters used were articles written in English and published in the last five years. One study was included despite a publication date outside the last five years because of its usefulness in creating a survey. The number of articles found were 1,843 for *colorectal cancer screening recommendation*, 3,542 for *colorectal cancer screening provider*, and 535 for *colorectal cancer screening barrier*. The total number of articles, when eliminating duplicate articles found in more than one search, was 5,148. Further inclusion criteria incorporated article types of systematic reviews, meta-analysis, randomized control trials (RCTs), clinical practice guidelines (CPGs), reviews, and publications from professional groups. This brought the new total number of articles to 1,218. Final inclusion criteria encompassed discussion of provider



factors in screening rates, patient-reported barriers, and differences in screening rates based on screening modalities offered. From this point, articles were excluded if recommendations were based on screening guidelines not comparable to those of the United States or a mere description of screening modalities. The final number of articles utilized in this review was 14.

## **Review of Literature**

### **Patients' Colorectal Cancer Screening Decision-Making**

#### ***Facilitators to Screening***

Patients' decisions to undergo colorectal cancer (CRC) screening have been related to a variety of facilitators and barriers. A study of eight focus groups in federally qualified health centers and a systematic review and meta-synthesis of 92 qualitative studies identified four common facilitators for CRC screening, such included peace of mind from early detection and prevention, family or social support, provider recommendation and education, and media promotion of screening and education (Gwede et al., 2015; Honein-AbouHaidar et al., 2016). The focus group identified another motivator to screening: having a personal connection to someone who had CRC (Gwede et al., 2015). In a group-randomized multi-level intervention study of individuals not up-to-date on CRC screening, 74% of participants stated they would participate in a screening test if recommended by a provider, but only 33% reported plans to participate in screening in the next six months (Katz et al., 2018).

#### ***Barriers to Screening***

While provider recommendation was identified as a facilitator to CRC screening, lack of provider recommendation was one of many barriers to screening (Gwede et al., 2015; Honein-AbouHaidar et al., 2016; Katz et al., 2018). Additionally, only 86% of surveyed primary care providers (PCPs) reported regular recommendation of CRC screening by any modality

(Chapman et al., 2012). Katz et al. (2018) conducted a multi-level intervention study including 109 participants who were mailed a screening recommendation letter from their PCP with a brochure from the American Cancer Society regarding CRC screening. The participants were asked to identify barriers to screening, and 23.9% of the participants reported a lack of a recommendation (Katz et al., 2018). This lack of acknowledgement of recommendation via letter was consistent with findings of a qualitative study of 3,415 patients who were recommended fecal immunochemical testing (FIT) by mass mailing, telephone conversation, or clinic visit. Only 7.3% of participants who received the mass mailing returned their FIT, compared to 63.3% of those who had a telephone conversation, and 95.4% of those counseled during a clinic visit (Fleming et al., 2018).

Additional barriers reported by patients included factors related to knowledge deficits, specific modalities, and financial concerns. Patients reported they were not aware they needed screening because they did not have a family history of CRC or did not understand the importance of screening (Gwede et al., 2015; Honein-AbouHaidar et al., 2016; Katz et al., 2018). Furthermore, lack of transportation to and from colonoscopies and lack of insurance or concern about cost were identified as deterrents to CRC screening (Gwede et al., 2015; Honein-AbouHaidar et al., 2016; Katz et al., 2018)).

The most common barrier identified by 55% of participants in a barrier-related telephone survey was the inconvenient and time-consuming nature of the screening (Katz et al., 2018). This finding was supported by concerns of competing responsibilities and priorities, such as work, being a caregiver, tending to other health concerns, and scheduling conflicts (Honein-AbouHaidar et al., 2016). Others reported coordination of transportation and dietary preparation as time-related inconveniences (Gwede et al., 2015). Additionally, Katz et al. (2018) identified a

relationship between higher levels of education and income with the increased barriers to screening. The authors hypothesized this may be related to a busy lifestyle or modality of screening recommended to the participants (Katz et al., 2018). This finding was inconsistent with the findings of the American Cancer Society (2020), which reported only 53% of adults 45 years of age or older with less than a high school education were up-to-date on CRC screening compared to 73% of college graduates in the same age group.

### **Provider Strategies to Increase Screening**

Multiple studies identified patient compliance with screening recommendations or instructions specific to testing modalities as major or minor barriers to CRC screening (Butterly, 2020; Chapman et al., 2012; Schiff et al., 2017). Providers must overcome these barriers and patient-identified barriers to improve CRC screening rates. Only one study found in this literature search assessed the prevalence of provider behaviors to increase screening rates. This study completed a survey of 609 PCPs in Alabama (Chapman et al., 2012). Despite its year of publication, the study was included because it will be used to guide the development of the survey for this project.

These PCPs were asked to identify their behaviors regarding recommendations, follow-up, and technology (Chapman et al., 2012). PCPs indicated they most frequently utilized in-office discussions to educate patients regarding colorectal cancer screening (95.6%), and 86% reported recommending screening by any modality on a regular basis (Chapman et al., 2012). When asked to identify a preferred modality of CRC screening in asymptomatic, average risk patients over age 50, 52.1% of PCPs selected colonoscopy, compared to 22.8% who preferred in-office stool tests and 22.1% who chose take-home stool tests (Chapman et al., 2012). The majority of PCPs (84.2%) indicated they would recommend gFOBt over a high sensitivity stool

test, while only 10.7% indicated they had a solid understanding of FIT screening (Chapman et al., 2012). When following up on take-home stool tests that were not returned, the most common strategies were waiting to address it at the next visit (58.6%) or calling the patient [22.6%] (Chapman et al., 2012). The majority of PCPs (54.2%) indicated they did not use a patient reminder system to track patients who were over age 50, asymptomatic, and at average risk for CRC and were not intending to implement such a system in the near future (Chapman et al., 2012).

### ***Organized Screening Approach***

Each of the authors discussed approaches to screening identified usual care as opportunistic screening, which relies on a routine office visit to trigger a screening recommendation by the provider (Butterly, 2020; Chapman et al., 2012; Coronado et al., 2018; Levin et al., 2018). Only one-third of providers surveyed reported the use of a formal system to notify patients of the need for screening, with 15% utilizing a reminder system in the electronic health record [EHR] (Chapman et al., 2012). This survey was outdated and warrants a current survey to evaluate current systems and increased use of EHR capabilities.

Organized screening approaches were used to implement FIT screening and compare rates of completion with those found in usual care in two studies (Coronado et al., 2018; Levin et al., 2018). Coronado et al. (2018) conducted a randomized study comparing the rates of FIT completion of patients at 26 clinics and found a 3.4% increase in FIT completion and 3.8% increase in any modality of screening among the organized screening group compared to the opportunistic group (Coronado et al., 2018). This increase was not as remarkable as the increase in screening of more than 1 million members of an insurance group from 2000-2015. The baseline screening rate in 2000 was 38.9% of eligible members, and the screening rate grew to

82.7% in 2015 after implementation of the mail-to-home FIT program (Levin et al., 2018). This population also experienced a 25.5% decrease in CRC incidence and a 52.4% decline in CRC mortality (Levin et al., 2018). Additionally, the authors addressed the importance of provider follow-up after a positive FIT test, with a 42% increase in patient participation in follow-up colonoscopies over the 15-year period (Levin et al., 2018).

### ***Navigation***

Navigation is a concept similar to organized screening. A patient navigator is an individual who assists patients in overcoming the barriers preventing them from participating in CRC screening (Butterly, 2020). Navigation was only identified by two articles (Butterly, 2020; Dougherty et al., 2018). Navigation was identified as the most effective intervention to combat barriers to colorectal cancer screening and increased screening rates by 20% (Butterly 2020; Dougherty et al., 2018). Additionally, navigators employed by Exact Sciences, the corporation behind the combination FIT-DNA testing product, *Cologuard*, contact patients who have not returned samples to the corporation for processing (Butterly, 2020; Weiser et al., 2020). While this navigation by Exact Sciences was identified as a probable influence in increased rates of completion, causality was not determined (Weiser et al., 2020).

### ***Screening Modalities***

Colonoscopy and FIT were the CRC screening modalities most often found in literature. Some patients reported a preference for FIT compared to colonoscopy related to convenience and lack of discomfort, though some were concerned about FIT being unsanitary (Gwede et al., 2015; Honein-AbouHaidar et al., 2016). Other patients prefer colonoscopy because they believe it to be the most accurate modality of screening (Honein-AbouHaidar et al., 2016). Though the motivation for selecting colonoscopy was not reported, 33.6% of participants in the insurance

group study requested colonoscopy instead of the default modality of FIT (Levin et al., 2018). Colonoscopy remains the most commonly utilized screening test, though recommendations include multiple modalities (Butterly, 2020). Of the 589 physicians who responded, 52.1% reported they would recommend colonoscopy over other modalities of screening (Chapman et al., 2012). A secondary recommendation for CRC was not asked if the patient declined colonoscopy. This recommendation was incongruent with other professional organizations in providing information about multiple screening modalities while utilizing a shared decision-making approach with the patient (American Cancer Society, 2020; Schiff et al., 2017; USPSTF, 2016; Wilkins et al., 2018).

### **Summary of Themes**

Common themes can be derived from the literature. The influence of provider recommendation for screening and the negative effects of not recommending screening highlight the importance of the provider role in promoting CRC screening. Similarly, providers should utilize one-on-one conversations when possible and provide education regarding the purpose of screening. Patients' unique barriers to screening, such as time, transportation, and concerns regarding discomfort, should be assessed and considered when making screening recommendations. Providers may achieve an increase in screening rates with the use of an organized approach, navigation, or modalities preferred by patients. Because providers influence the decision to participate in screening and carry the responsibility, data regarding the behaviors of providers related to screening may identify areas for provider improvement. The only identified study in this review was outdated and warrants updating.

### **Theoretical Framework**

The theoretical framework guiding this project is the Precaution Adoption Process Model

(PAPM). Weinstein and Sandman (1992) developed the PAPM. The PAPM is specific to health-related issues and is comprised of seven stages a person progresses through in gaining knowledge which changes behaviors (Weinstein & Sandman, 2002).

The first stage of the PAPM is when the individual is unaware of health issue of interest. When the person becomes informed of the health issue but is not engaged by it, he or she is in stage 2. The third stage is the decision-making stage, which is when the person is engaged with the issue and deciding how to act. This stage can lead to stage 4 or stage 5. Stage 4 ends the PAPM if the person decides not to make any behavioral changes. Stage 5 is the path taken if the individual decides to adopt the health change, and stage 6 is the step of initiating the behavior change. The final stage, stage 7, is the process of maintaining the change over time (Weinstein & Sandman, 2002).

In this project, the PAPM will be applied to providers recommending colorectal cancer screening. This project will assess providers' current knowledge of colorectal cancer screening recommendations, determine their engagement with the knowledge, and evaluate their actions as a result. This will be achieved through the use of a survey of Indiana nurse practitioners. The authors of the PAPM emphasize the importance of identifying the most common stages individuals are in and tailoring interventions to address hurdles in those stages preventing adoption of the health-related behavior (Weinstein & Sandman, 2002).

Prior to the implementation of this project, the last published update of the guidelines for colorectal cancer screening were published in 2016 (United States Preventative Services Task Force [USPSTF], 2020). Because these guidelines have been established for years, most providers are likely aware of the guidelines and probably fall in the later stages of the PAPM, likely in the maintenance phase. However, the United States Preventative Services Task Force

(USPSTF) released a draft of updated colorectal cancer screening guidelines on October 27, 2020, which would lower the age for initial colorectal cancer screening in asymptomatic adults at average risk to 45 years (USPSTF, 2020). These guidelines were officially adopted May 18, 2021, during the data collection portion of this project, which likely will affect the results of the survey (USPSTF, 2021). The knowledge gleaned by the survey in this project and the PAPM may be useful in relaying updated guidelines to providers or assessing knowledge of the updated guidelines in the future. By determining the stages of the PAPM currently occupied by providers, future projects may use this data to tailor specific interventions to increase providers' behaviors in promoting the updated guidelines.

### **Goals, Objectives and Expected Outcomes**

The main goals of this project are to measure the percentage of nurse practitioners who use the USPSTF guidelines to inform their practices and the percentage who offer screening modalities outside of colonoscopy alone. Another goal is to determine the percentage of nurse practitioners who have a plan for following up with patients who have not undergone screening. This data will be gathered and analyzed via the Qualtrics Survey Platform, which will be managed by this author. Greater than 50% of nurse practitioners are expected to be familiar with the USPSTF guidelines for colorectal cancer screening and use these guidelines to inform their practices. Additionally, it is expected greater than 50% would have a plan to follow up with patients who have not been screened and offer multiple screening modalities, including colonoscopy.

### **Project Design/Methods**

This quality improvement project will be a program evaluation project utilizing quantitative data. An electronic survey link will be distributed by CAPNI administration via



email to its current membership. The survey will be based on the survey conducted by Chapman et al. (2012) and will be comprised of 16 multiple choice and Likert scale questions. Responses will be analyzed to glean knowledge regarding current practices and compared to the recommended practices from the literature. Survey completion and data collection and analysis will be managed via the Qualtrics Survey Platform. Descriptive statistics and chi square analysis will be performed by this author with the assistance of a Marian University statistician. The cost associated with this project is a \$50 application fee to CAPNI. The anticipated duration of this project is 7 months. This author has obtained training in ethical research practices and approval from the Marian University Institutional Review Board (IRB) prior to this project. Participation by CAPNI members will be voluntary, anonymous, and explained via an informed consent document. All data will be de-identified and password protected.

### **Project Site and Population**

Participants will be active members of CAPNI. Participants will be excluded if not currently working as a nurse practitioner. The project will be performed via an electronic survey accessible by email.

### **Methods**

A representative of CAPNI will email an online survey link to active CAPNI members. The survey will be an adaptation of the survey conducted by Chapman et al. (2012). The survey will consist of 16 multiple choice and Likert scale questions.

### **Measurement Instrument**

The instrument used in this project is a survey of 16 questions comprised of multiple choice and Likert scale questions. This is based on the survey created by Chapman et al. (2012)

and adapted to the population of interest and current screening recommendations. A copy of this adapted survey is attached (Appendix A).

### **Data Collection**

The survey will be managed using the Qualtrics Survey Platform. It will be distributed via an email link to the CAPNI membership, which will be active for one month. The email will contain a letter of informed consent information. A copy of this letter is attached (Appendix B). By clicking on the link to the survey at the end of the letter, participants provide consent. A reminder email will be sent halfway through this period at two weeks by a CAPNI representative.

The data collection and analysis will be completed via the Qualtrics Survey Platform by this author. Qualtrics will collect the non-identifiable survey responses in a spreadsheet-style format. The data will also be exported to an Excel spreadsheet as an additional method of ensuring the results are saved.

### **Data Analysis**

Data will be collected and analyzed using the Qualtrics Survey Platform. The analysis tools available within the Qualtrics Survey Platform will be the primary means of analysis. Descriptive statistical analysis will be used to summarize the most commonly recommended methods of screening and methods of identifying eligible patients. Descriptive statistics will also be used to describe the demographics of the sample population. Chi square testing will be used to compare the results of the survey to those in the Chapman et al. (2012) study for statistically significant differences. The results of the survey will also be compared to the current USPSTF recommendations to identify the percentage of providers following the most current

recommendations. A Marian University statistics professor, who is serving as a member of the committee for this DNP project, has also agreed to assist with statistical analysis.

### **Cost-Benefit Analysis/Budget**

The only costs associated with this DNP project are those related to CAPNI. Directly, a \$50 research application fee was paid to CAPNI for their consideration of acting as facilitators for this project. Indirectly, CAPNI membership is required to submit a research application, and membership requires dues. This author was already a due-paying member of CAPNI prior to the submission of the research application.

### **Timeline**

The expected timeline for this project from submission to the Institutional Review Board (IRB) to completion of the project manuscript is 7 months (Appendix C). Initial IRB submission occurred in January 2021, and final approval was acquired in March 2021. The initial CAPNI research request was submitted March 22, 2021, with additional information submitted April 9, 2021. Final approval from CAPNI is pending. Once CAPNI has approved the research request, the Qualtrics survey will be sent to the CAPNI representative responsible for distributing it to the CAPNI membership. It is anticipated the survey will be open for one month. After this one-month period, the data will be analyzed, and the manuscript will be completed.

### **Ethical Considerations/Protection of Human Subjects**

This author completed Collaborative Institutional Training Initiative (CITI) training prior to this project to ensure understanding of ethical research. Approval from the Marian University Institutional Review Board was obtained prior to initiating this project (Appendix D). The cover email preceding the survey link provides informed consent information to each potential participant. This author will not have any direct contact with participants and will not have

access to any identifiable information. All information collected in the survey will be anonymous, and participation is voluntary. There is no risk of harm to participants. The information to be shared with CAPNI after data analysis will be aggregate, so CAPNI members and staff will also not have access to any data possibly linking any responses to individuals. Additionally, the Qualtrics Survey Platform is password protected, and this author is the only person with access to the survey and results. The Excel spreadsheet containing the additional copy of the data is also password protected.

### **Data Analysis and Results**

Thirty-nine nurse practitioners completed the survey. Of these, four were excluded because they indicated they were not currently practicing. The majority (94.29%) of participants were females. Additionally, 60% were working in a family practice setting. Complete demographic information for the 35 participants is included below in Table 1.

**Table 1**

#### ***Sample Demographics***

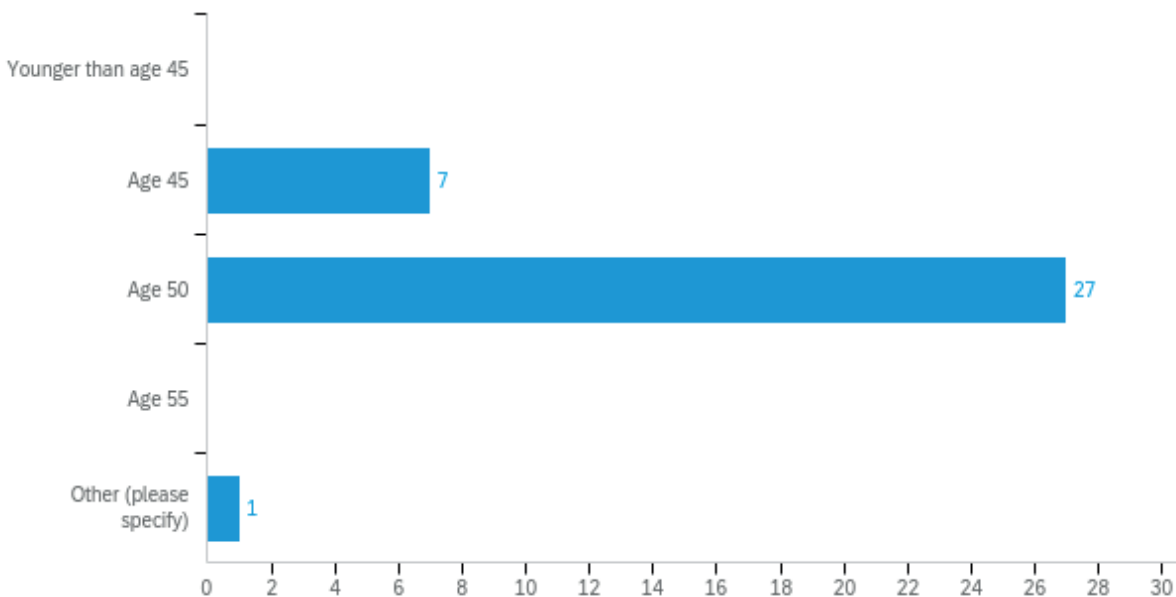
	Gender	Female	94.29% (33)
		Male	5.71% (2)
Age		Up to 30 years	0% (0)
		31-40 years	37.14% (13)
		41-50 years	20% (7)
		51-60 years	31.43% (11)
		Greater than 60 years	11.43% (4)
Type of Practice		Family Practice	60% (21)

Internal Medicine	5.71% (2)
Specialty	34.29% (12)

The majority of participants (80%) reported regularly recommending colorectal cancer screening. Only one participant reported never recommending colorectal cancer screening, three reported occasionally, and three responded seldomly recommending screening. Participants reported they began screening at ages 45 (20%) or 50 (77.14%) years, with one provider reporting they recommend screening to adult patients if the patient has high beta glucuronidase levels (Figure 1).

**Figure 1**

***Age of Initial Recommendation for Screening***

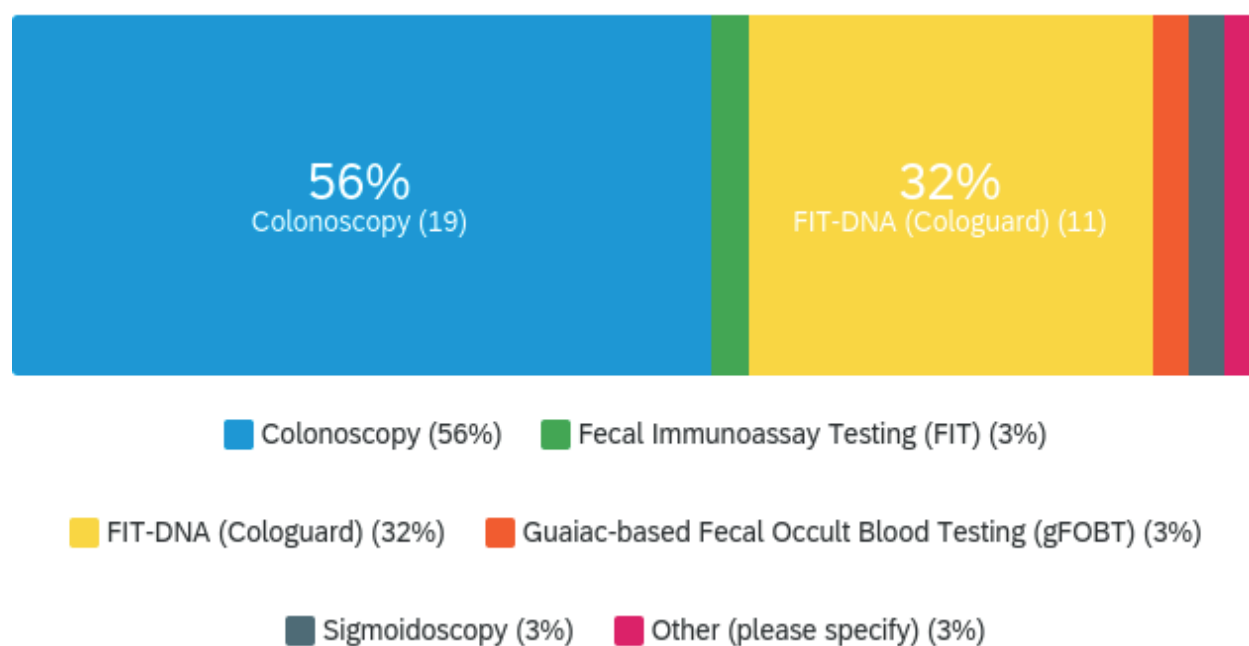


Most providers reported using guidelines from one or more professional organizations to guide their recommendations (88.57%). These organizations included the American Association of Family Practice (15.69%), the American Cancer Society (25.49%), the American College of Gastroenterology (17.65%), the United States Preventative Services Task Force (37.25%), and

others (3.92%). The majority of respondents reported they would first recommend the screening modality of colonoscopy to an average-risk, asymptomatic patient aged 50 years or older (Figure 2).

**Figure 2**

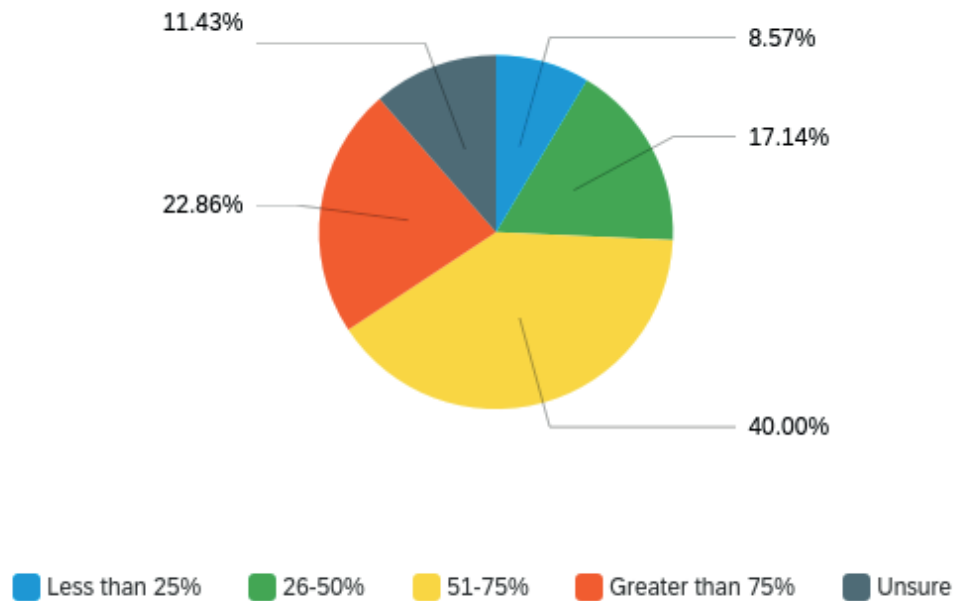
*First Recommended Screening Modality in Asymptomatic, Average-Risk Patient Aged 50+ Years*



If patients declined the recommended modality, 94.29% (33) reported they would recommend a second modality. Of those who selected colonoscopy as a first-choice modality, 68.42% (13) reported they would recommend FIT-DNA (Cologuard) testing as a second option. Among those who chose FIT-DNA (Cologuard) testing as a first recommendation, 40% (4) indicated they would recommend FIT second, 40% (4) selected gFOBT, and 20 % (2) selected colonoscopy.

**Figure 3**

*Which Percentage of Patients You Refer for Colonoscopy (Outside of COVID-19 Pandemic) Complete It?*

**Figure 4**

*Which Percentage of Patients You Order Stool-Based Testing for Complete It?*

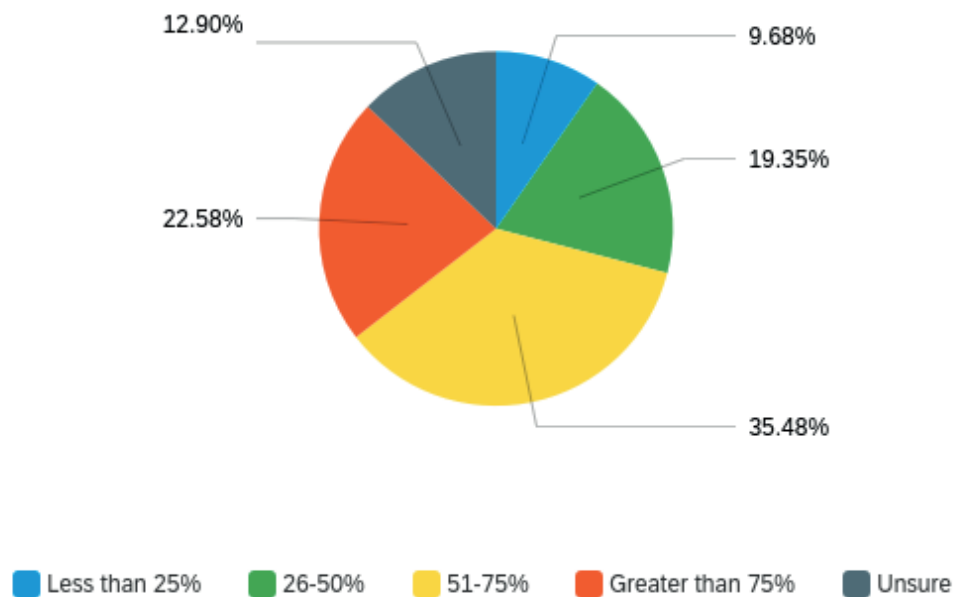


Figure 3 and Figure 4 above detail the reported percentage of patients who complete colonoscopies or stool-based testing when ordered. When a colonoscopy has been ordered, most (40%) participants estimated 51-75% of patients complete them, whereas 35.48% of participants estimated 51-75% completed stool-based testing when ordered. Additionally, completion estimates of 75% or greater were similar between stool-based testing (22.58%) and colonoscopy (22.86%). There is no statistically significant difference between the completion estimates of the colonoscopy and stool-based groups  $\chi^2 (4, N= 70) = 0.665, p= .956$  when compared via chi squared testing. Thus, no significant difference in completion rates was found between the modalities.

If a stool-based test was ordered but not returned, 54.29% (19) of respondents reported they would address it at the next office visit. A follow-up call would be placed by 20% (7) of participants. A patient portal message or mailed reminder would be utilized by 5.71% (2) and 8.57% (3), respectively.

Most participants (60%) reported they did not utilize a systematic approach to identifying patients meeting criteria for screening; patients were identified during a visit. Of the 14 participants using a systematic method to identify patients for screening, 71.43% reported using a notification in the electronic chart as the method. A staff compiled list of patients eligible for screening was reported by 14.29% (2) of participants.

Compared to the study performed by Chapman et al. (2012), the use of gFOBT testing was decreased and the use of high-sensitivity stool-based tests was increased in this sample. Chapman et al. (2012) reported 84% of providers ordering stool-based testing ordered gFOBT and 14% ordered high-sensitivity tests. In the sample population from this survey, only 3% of respondents reported they would recommend gFOBT as their first-choice modality for screening.



Additionally, 32% reported FIT-DNA (Cologuard) testing to be their first-choice test for screening, and 68.42% reported they would recommend FIT-DNA (Cologuard) testing as a second-choice modality if the patient declined colonoscopy. Colonoscopy remained the first-choice modality for the majority of providers in both surveys, with 56% in the current survey and 52.1% in the Chapman et al. (2012) survey recommending it over other modalities in average risk patients. No statistically significant differences were found in the frequency of recommending colorectal cancer screening between the participants of this survey and the Chapman et al. (2012) survey,  $\chi^2 (3, N= 620)= 3.915, p=.270$ .

### **Discussion**

The increase in use of high-sensitivity stool-based tests and decreased recommendation for gFOBT testing is clinically significant. As discussed previously, gFOBT is the screening modality with the lowest sensitivity and specificity, and gFOBT can only detect actively bleeding lesions (Elfant, 2015; Wilkins, 2018). Conversely, FIT-DNA (Cologuard) testing is 92% sensitive and 90% specific for colorectal cancer detection (Wilkins, 2018). Changes in stool-based testing recommendations must be considered in light of differences between the surveys. When the Chapman et al. (2012) study was published, FIT-DNA (Cologuard) testing was not available. Cologuard gained Food and Drug Administration (FDA) approval in 2014, and the USPSTF included Cologuard in its recommendations for screening in 2016 (Exact Sciences, 2019).

The USPSTF published updated guidelines regarding the age to initiate colorectal cancer screening during the survey collection portion of this project. Therefore, it is impossible to determine if participants' responses to the question regarding the age they begin recommending screening for patients was based on the existing guidelines or the new guidelines. A future

project may be warranted to evaluate this practice after the current guidelines have been in place for a longer period of time.

It was expected prior to the data collection portion of this project that greater than 50% of participants would be familiar with the USPSTF guidelines for screening and use them to inform their recommendation practices. While this survey revealed that 88.57% of participants utilized some form of professional organization recommendations when recommending colorectal cancer screening, only 37.25% reported utilizing USPSTF guidelines. The USPSTF guidelines were the utilized less often than anticipated, but these guidelines were still reported as the most frequently used guidelines. The population of participants not using any guidelines to inform their care indicates an opportunity for educational outreach on the most up-to-date recommendations.

An additional expectation prior to the data collection portion of this project was that greater than 50% of nurse practitioners participating in the survey would have a plan for follow-up if patients did not complete stool-based testing after it was discussed and ordered. While 88.57% of participants indicated they would follow up with the patient in some form, including at the next visit, via phone, via mail, or via EHR message, the majority (54.29%) reported they would follow up at the next visit. The survey did not allow for participants to indicate how long it may be before they were able to follow up with the patient, i.e. if they would wait for an annual exam. The timeframe in which a provider follows up may impact when the patient completes screening.

The phrasing of questions utilized in the survey must be considered when interpreting results because of potential bias. Participants may have responded to survey questions indicating they practice in a particular way because of an identified best practice. However, they may not be truly practicing in that manner. Additionally, participants were asked to estimate patient

completion of screening, which may not accurately reflect completion rates. These factors must be considered when evaluating clinical implications.

There were no statistically significant differences found between completion estimates of colonoscopy-based and stool-based screening. The potential for inaccurate estimates of completion must be considered when interpreting this finding. This finding may suggest there is no advantage to recommending a particular modality over another from the standpoint of completion likelihood. However, more research with actual completion rates should be considered before utilizing this information.

Additionally, there was no statistically significant difference in the frequency of recommending colorectal cancer screening between this survey and the Chapman et al. (2012) survey. This finding could indicate there has not been improvement in rates of colorectal cancer screening recommendations by PCPs since 2012. However, factors that could influence the findings must be considered when comparing the two surveys. The concern of inaccurate reporting of practices by participants must be considered. The actual frequency of recommending colorectal cancer screening to patients may not be the same as the reported frequency. Actual recommendation frequencies in a larger, more diverse sample should be considered.

When comparing this survey and the survey by Chapman et al. (2012), factors that could influence different findings must be considered. The most significant difference to be considered is the participating populations. This survey included 35 Indiana nurse practitioners who were members of CAPNI, whereas the Chapman et al. (2012) survey included 609 physicians from Alabama working in the fields of family medicine, internal medicine, and obstetrics/gynecology. The Chapman et al. (2012) sample is significantly larger, and the education and background of each of these groups vary. Another consideration in differences between the studies is the

advancement of technology, particularly the increased use of EHRs to identify patients eligible for screening.

The survey in this project was based on the survey used by Chapman et al. (2012). However, there are limitations to the survey used in this project. The survey did not ask participants to specify their field of work if working in a specialty practice. Knowing this information could provide insight as to which types of practices most commonly recommend colorectal cancer screening. Additionally, most of the participants in this survey were females, which may be related to the target population of nurse practitioners. Therefore, screening recommendation practices could not be compared based on provider gender. Finally, providers were asked to estimate the percentage of patients who complete colonoscopy and stool-based screening in their practices. Because the providers were estimating, actual percentages could vary and reveal a statistically significant difference in completion based on modality.

### **Conclusion**

Early detection of colorectal cancer is essential to early treatment and reduced mortality. Healthcare providers influence patients' willingness to complete colorectal cancer screening by recommending screening modalities. This survey identified colonoscopy and FIT-DNA (Cologuard) testing as the most frequently recommended screening modalities among the nurse practitioners who participated. Because USPSTF guidelines updated during the implementation phase of this project, limited data regarding current knowledge of guidelines among the nurse practitioners was available. Additional research regarding knowledge of the updated guidelines, length of time to follow up on outstanding screening, and actual percentage of completed screening tests is warranted. Additionally, educational opportunities regarding current guidelines may be beneficial for providers.

### References

- American Cancer Society. (2020). *Colorectal cancer facts & figures 2020-2022*.  
<https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/colorectal-cancer-facts-and-figures/colorectal-cancer-facts-and-figures-2020-2022.pdf>
- Butterly, L. F. (2020). Proven strategies for increasing adherence to colorectal cancer screening. *Gastrointestinal Endoscopy Clinics of North America*, 30(3), 377-392.  
<https://doi.org/10.1016/j.giec.2020.02.003>
- Chapman, K., Nicholls, K., Sullivan, M. M., Crutchfield, S., Shaw, T., Perkins, A., & Reed, E. (2012). Colorectal cancer screening practices in Alabama: A survey of primary care physicians. *Journal of Cancer Education*, 27(4), 687-694.  
<https://doi.org/10.1007/s13187-012-0392-6>
- Coronado, G. D., Petrik, A. F., Vollmer, W. M., Taplin, S. H., Keast, E. M., Fields, S., & Green, B. B. (2018). Effectiveness of a mailed colorectal cancer screening outreach program in community health clinics. *Journal of the American Medical Association Internal Medicine*, 178(9), 1174-1181. <https://doi.org/10.1001/jamainternmed.2018.3629>
- Dougherty, M. K., Brenner, A. T., Crockett, S. D., Gupta, S., Wheeler, S. B., Coker-Schwimmer, M., Cubillos, L., Malo, T., & Reuland, D. S. (2018). Evaluation of interventions intended to increase colorectal cancer screening rates in the United States. *Journal of the American Medical Association Internal Medicine*, 178(12), 1645-1658.  
<https://doi.org/10.1001/jamainternmed.2018.4637>
- Elfant, A. B. (2015). Colorectal cancer screening. *The Journal of Family Practice*, 64(12), S10-S15. <https://www.mdedge.com/familymedicine/article/104701/hot-topics-primary-care>

- Exact Sciences. (2019). *Cologuard gains FDA approval for use in younger Americans, ages 45-49*. <https://investor.exactsciences.com/investor-relations/press-releases/press-release-details/2019/Cologuard-Gains-FDA-Approval-For-Use-In-Younger-Americans-Ages-45-To-49/default.aspx>
- Fleming, T. J., Benitez, M. G., & Ritterman Weintraub, M. L. (2018). Evaluating the effectiveness of one-on-one conversations to increase colorectal cancer screening in a community-based clinical setting. *The Journal of the American Osteopathic Association*, 118(1), 26-33. <https://jaoa.org/article.aspx?articleid=2668379>
- Gwede, C. K., Koskan, A. M., Quinn, G. P., Davis, S. N., Ealey, J., Abdulla, R., Vadaparampil, S. T., Elliott, G., Lopez, D., Shibata, D., Roetzheim, R. G., Meade, C. D., & the Tampa Bay Community Cancer Network. (2015). Patients' perceptions of colorectal cancer screening tests and preparatory education in federally qualified health centers. *Journal of Cancer Education*, 30(2), 294-300. <https://doi.org/10.1007/s13187-014-0733-8>
- Honein-AbouHaidar, G. N., Kastner, M., Vuong, V., Perrier, L., Daly, C., Rabeneck, L., Straus, S., & Baxter, N. N. (2016). Systematic review and meta-study synthesis of qualitative studies evaluating facilitators and barriers to participation in colorectal cancer screening. *Cancer, Epidemiology, Biomarkers, & Prevention*, 25(6), 907-917. <https://doi.org/10.1158/1055-9965.EPI-15-0990>
- Issa, I. A., & Nouredine, M. (2017). Colorectal cancer screening: An updated review of the available options. *World Journal of Gastroenterology*, 23(28), 5086-5096. <https://doi.org/10.3748/wjg.v23.i28.5086>
- Katz, M. L., Young, G. S., Zimmermann, B. J., Tatum, C. M., & Paskett, E. D. (2018). Assessing colorectal cancer screening barriers by two methods. *Journal of Cancer Education*, 33(3),

- 536-543. <https://doi.org/10.1007/s13187-016-1148-5>
- Levin, T. R., Corley, D. A., Jensen, C. D., Schottinger, J. E., Quinn, V. P., Zauber, A. G., Lee, J. K., Zhao, W. K., Udaltsova, N., Ghai, N. R., Lee, L. T., Quesenberry, C. P., Fireman, B. H., & Doubeni, C. A. (2018). Effects of organized colorectal cancer screening on cancer incidence and mortality in a large, community-based population. *Gastroenterology*, 155(5), 1383-1391. <https://doi.org/10.1053/j.gastro.2018.07.017>
- Meester, R. G. S., Doubeni, C. A., Zauber, A. G., Goede, S. L., Levin, T. R., Corley, D. A., Jemal, A., & Lansdorp-Vogelaar, I. (2015). Public health impact of achieving 80% colorectal cancer screening rates in the United States by 2018. *Cancer*, 121(13), 2281-2285. <https://doi.org/10.1002/cncr.29336>
- Montminy, E. M., Karlitz, J. J., & Landreneau, S. W. (2018). Progress of colorectal cancer screening in United States: Past achievements and future challenges. *Preventative Medicine*, 120, 78-84. <https://doi.org/10.1016/j.ypmed.2018.12.004>
- National Cancer Institute. (2005). *Theory at a glance: A guide for health promotion practice* (2nd ed.). U.S. Department of Health and Human Services, National Institutes of Health. <https://cancercontrol.cancer.gov/sites/default/files/2020-06/theory.pdf>
- National Colorectal Cancer Roundtable. (2017). *About 80% by 2018*. <http://nccrt.org/wp-content/uploads/80-by-2018-TALKINGPOINTS-Final-2.16.17.pdf>
- Schiff, G. D., Bearden, T., Swain Hunt, L., Azzara, J., Larmon, J., Phillips, R. S., Singer, S., Bennett, B., Sugarman, J. R., Bitton, A., & Ellner, A. (2017). Primary care collaboration to improve diagnosis and screening for colorectal cancer. *The Joint Commission Journal on Quality and Patient Safety*, 43(7), 338-350. <https://doi.org/10.1016/j.jcjq.2017.03.004>
- Tolbert, J., Ogrera, K., Singer, N., & Damico, A. (2019). Key facts about the uninsured

population. *Henry J. Kaiser Family Foundation*. <http://files.kff.org/attachment/Issue-Brief-Key-Facts-about-the-Uninsured-Population>

United States Preventative Services Task Force. (2016). Screening for colorectal cancer: US Preventative Services Task Force recommendation statement. *Journal of the American Medical Association*, 315(23), 2564-2575. <https://doi.org/10.1001/jama.2016.5989>

United States Preventative Services Task Force. (2020, October 27). *Draft recommendation statement: Colorectal cancer: Screening*. <https://uspreventiveservicestaskforce.org/uspstf/draft-recommendation/colorectal-cancer-screening3>

United States Preventative Services Task Force. (2021). Screening for colorectal cancer: US Preventive Services Task Force recommendation statement. *Journal of the American Medical Association*, 325(19), 1965-1977. <https://doi.org/10.1001/jama.2021.6238>

Weinstein, N. D., & Sandman, P. M. (1992). A model of the precaution adoption process: Evidence from home radon testing. *Health Psychology*, 11(3), 170–180. <https://doi.org/10.1037/0278-6133.11.3.170>

Weinstein, N. D., & Sandman, P. M. (2002). The precaution adoption process model and its application. In R. J. DiClemente, R. A. Crosby, & M. C. Kegler (Eds.), *Emerging theories in health promotion practice and research: Strategies for improving public health* (pp. 16-39). John Wiley & Sons. [https://books.google.com/books?hl=en&lr=&id=ddPm7RGE4UEC&oi=fnd&pg=PA16&dq=precaution+adoption+process+model+sandman&ots=FHFfL\\_thf1&sig=zz66Upf\\_MeKcrMMkXQktelRL\\_Gs#v=onepage&q=precaution%20adoption%20process%20model%20sandman&f=false](https://books.google.com/books?hl=en&lr=&id=ddPm7RGE4UEC&oi=fnd&pg=PA16&dq=precaution+adoption+process+model+sandman&ots=FHFfL_thf1&sig=zz66Upf_MeKcrMMkXQktelRL_Gs#v=onepage&q=precaution%20adoption%20process%20model%20sandman&f=false)



Weiser, E., Parks, P. D., Swartz, R. K., Van Thomme, J., Lavin, P. T., Limburg, P., & Berger, B.

M. (2020). Cross-sectional adherence with the multi-target stool DNA test for colorectal cancer screening: Real-world data from a large cohort of older adults. *Journal of Medical Screening*. Advance online publication. <https://doi.org/10.1177%2F0969141320903756>

Wilkins, T. McMechan, D., & Talukder, A. (2018). Colorectal cancer screening and prevention.

*American Family Physician*, 97(10), 658-665.

<https://www.aafp.org/afp/2018/0515/p658.html>

**Appendix A***Survey for Indiana Nurse Practitioners*

## Colorectal Cancer Screening Survey

1. Gender:
  - a. Female
  - b. Male
  - c. Other (specify)
2. Age:
  - a. Up to 30 years
  - b. 31-40 years
  - c. 41-50 years
  - d. 51-60 years
  - e. Greater than 60 years
3. What type of practice do you actively work in?
  - a. Family Practice
  - b. Internal Medicine
  - c. Specialty Practice
  - d. Not actively practicing
4. Which type of area is your practice located in?
  - a. Rural/town
  - b. Medium city
  - c. Large city
  - d. Suburb

5. How often do you recommend colorectal cancer screening of any kind in your practice?
  - a. Regularly
  - b. Occasionally
  - c. Seldom
  - d. Never
6. At which age do you recommend initial colorectal cancer screening for patients without personal or family histories of colorectal cancer?
  - a. Younger than age 45
  - b. Age 45
  - c. Age 50
  - d. Age 55
  - e. Other (specify)
- 7a. Do you use guidelines from a professional organization to guide your colorectal cancer screening recommendations?
  - a. Yes
  - b. No
- 7b. If so, which guidelines do you utilize? (Select all that apply)
  - a. American Association of Family Practice
  - b. American Cancer Society
  - c. American College of Gastroenterology
  - d. United States Preventative Services Task Force (USPSTF)
  - e. Other (Specify)
8. In an asymptomatic, average-risk patient aged 50 years or older, which screening test

would you first recommend?

- a. Colonoscopy
  - b. Fecal Immunoassay Testing (FIT)
  - c. FIT-DNA (*Cologuard*)
  - d. Guaiac-based Fecal Occult Blood Testing (gFOBT)
  - e. Sigmoidoscopy
  - f. Other (Specify)
- 9a. Would you recommend a different screening test if the patient declined screening with your first recommendation?
- a. Yes
  - b. No
- 9b. If so, which test would you recommend second?
- a. Colonoscopy
  - b. Fecal Immunoassay Testing (FIT)
  - c. FIT-DNA (*Cologuard*)
  - d. Guaiac-based Fecal Occult Blood Testing (gFOBT)
  - e. Sigmoidoscopy
  - f. Other (Specify)
10. What percentage of patients you refer for colonoscopy (outside of pandemic) complete the colonoscopy?
- a. Less than 25%
  - b. 26-50%
  - c. 51-75%

- d. Greater than 75%
  - e. Unsure
11. What percentage of patients you order stool-based testing (FIT, FIT-DNA/*Cologuard*, gFOBT) for complete it?
- a. Less than 25%
  - b. 26-50%
  - c. 51-75%
  - d. Greater than 75%
  - e. Unsure
12. If a stool-based test has been ordered, but you have not received any results, what is your most likely course of patient follow-up?
- a. Address at next office visit
  - b. Follow-up call
  - c. Patient portal message
  - d. Mailed reminder
  - e. No follow-up
  - f. Other (Specify)
- 13a. Do you have a systematic method to identify patients meeting screening criteria?
- a. Yes
  - b. No, patients are identified during a visit
- 13b. If so, what methods do you utilize?
- a. Notification in electronic chart
  - b. Staff-compiled list

c. Other (specify)

Adapted from Chapman, K., Nicholls, K., Sullivan, M. M., Crutchfield, S., Shaw, T., Perkins, A., & Reed, E. (2012). Colorectal cancer screening practices in Alabama: A survey of primary care physicians. *Journal of Cancer Education*, 27(4), 687-694.

<https://doi.org/10.1007/s13187-012-0392-6>

**Appendix B***Cover Email to CAPNI Membership for Participation in Research*

Dear CAPNI Member,

You are being asked to take part in a quality improvement project, “Nurse Practitioners’ Knowledge and Behaviors in Recommending Colorectal Cancer Screenings”, being conducted by Julie Dorsett as partial fulfillment of the Doctor of Nursing Practice (DNP) degree requirement under the supervision of Dr. Jeanne Potts in the Department of Nursing Graduate Studies at Marian University, Indianapolis, IN. Nurse Practitioners who are members of the Coalition of Advanced Practice Nurse Practitioners of Indiana (CAPNI) are of interest because of their role in recommending and ordering colorectal screenings for asymptomatic patients at average risk for colorectal cancer.

The purpose of this project is to understand nurse practitioners’ knowledge and behaviors regarding colorectal cancer screening recommendations. The findings will be compared to current colorectal cancer screening guidelines from the United States Preventative Services Task Force (USPSTF).

If you agree to participate in this study, you will be asked to complete a short Qualtrics survey concerning knowledge of and recommendations for colorectal cancer screening. The entire survey should not take more than 10-15 minutes to complete. This survey is anonymous and there will not be any information which will link you to the Qualtrics survey.

There are no foreseeable risks involved in participating in this project beyond those experienced in everyday life. There are no direct benefits to you from participation, but the results of the project may be helpful when recommending colorectal cancer screenings in the future.

The survey data will be anonymous and confidential. There will not be any information linking you to the survey responses. Survey data will be reported in aggregate and shared with the CAPNI leadership to ascertain any further educational offerings.

Participation in this project is voluntary and is indicated by starting the Qualtrics survey link included below. If you do not want to be in this project, you do not have to participate, and you may close this email. Even if you decide to participate, you are free to not answer any questions or to withdraw from participation at any time without penalty.

If you have questions about this project, please feel free to contact Julie Dorsett at [jdorsett299@marian.edu](mailto:jdorsett299@marian.edu) or faculty sponsor Dr. Jeanne Potts at [jpotts@marian.edu](mailto:jpotts@marian.edu).

Participation is voluntary is indicated by clicking the Qualtrics link below to start the survey.

Add LINK TO QUALTRICS SURVEY here

Thank you in advance for your time. It is appreciated.

Julie Dorsett, FNP student, DNP candidate

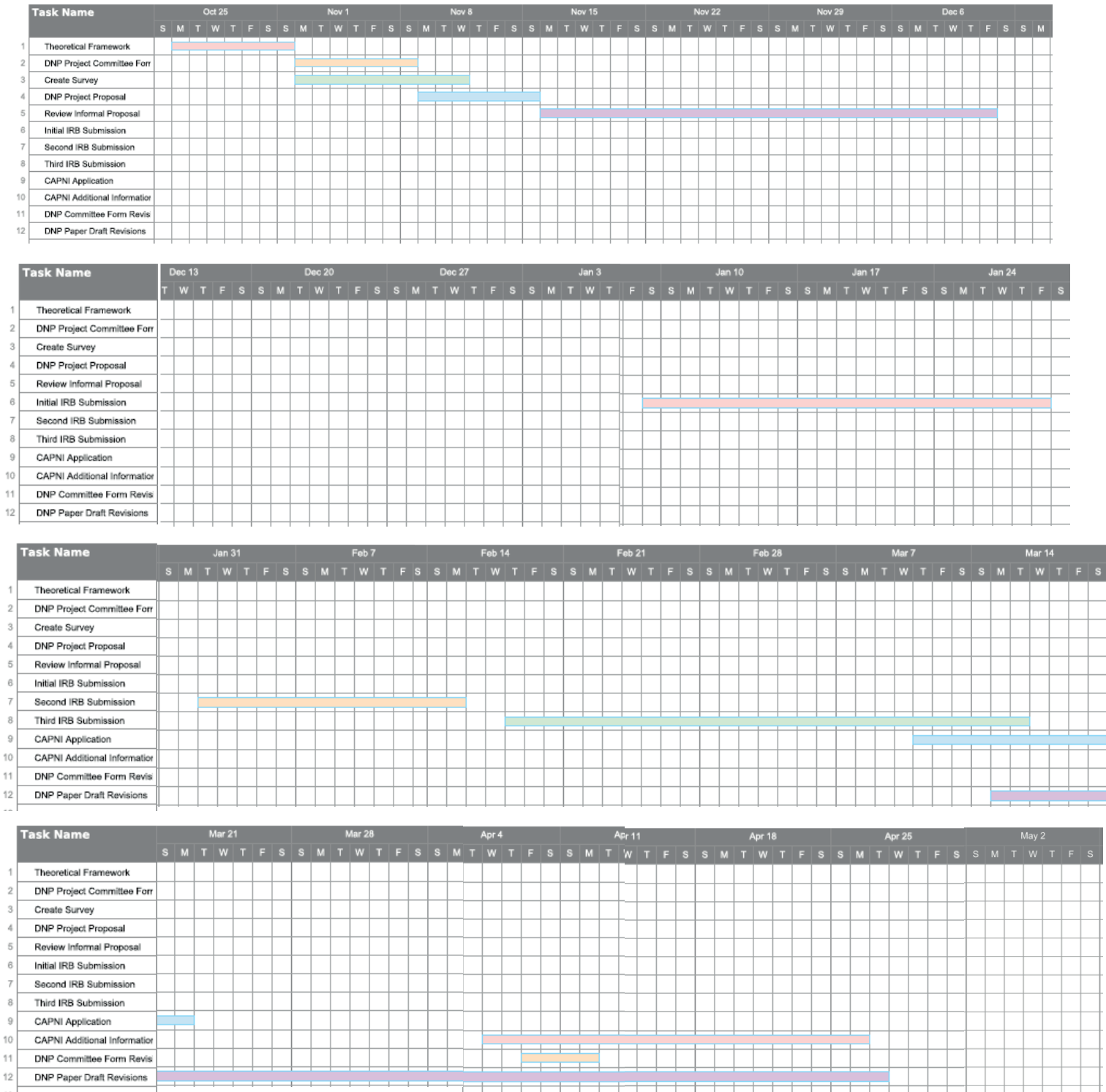
Dr. Jeanne Potts, WHNP-BC, FNP-C, Associate Professor Marian University DNP-FNP Program



## Appendix C

### Project Timeline

#### DNP Project Timeline



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## Appendix D

### *Marian University IRB Approval of Project*



### *Institutional Review Board*

DATE: 03-16-2021  
TO: Julie Dorsett  
FROM: Institutional Review Board  
RE: IRB #B21.207  
TITLE: Nurse Practitioners' Knowledge and Behaviors in Recommending Colorectal Cancer Screening  
SUBMISSION TYPE: New Project  
ACTION: Determination of Exempt Status  
DECISION DATE: 03-16-2021

The Institutional Review Board at Marian University has reviewed your protocol and has determined the procedures proposed are appropriate for exemption under the federal regulations. As such, there will be no further review of your protocol and you are cleared to proceed with your project. The protocol will remain on file with the Marian University IRB as a matter of record. Please be mindful of the importance of reporting only de-identified, HIPAA-compliant information about the patient in any exhibit or publication.

Although researchers for exempt studies are not required to complete online CITI training for research involving human subjects, the IRB recommends that they do so, particularly as a learning exercise in the case of student researchers. Information on CITI training can be found on the IRB's website:

<http://www.marian.edu/academics/institutional-review-board>.

It is the responsibility of the PI (and, if applicable, the faculty supervisor) to inform the IRB if the procedures presented in this protocol are to be modified or if problems related to human research participants arise in connection with this project. Any procedural modifications must be evaluated by the IRB before being implemented, as some modifications may change the review status of this project. Please contact me if you are unsure whether your proposed modification requires review. Proposed modifications should be addressed in writing to the IRB. Please reference the above IRB protocol number in any communication to the IRB regarding this project.

A handwritten signature in black ink, appearing to read 'Amanda C. Egan'.

Amanda C. Egan, Ph.D.