Improving Colorectal Cancer Screening Rates in the Primary Care Setting

By

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Dedication

This Doctor of Nursing Practice scholarly practice project is dedicated to my late grandfather, John V. Temte, MD, Ph.D. He is remembered by his colleagues and patients as a great man and a skilled, compassionate doctor. I will always remember him for his smile, contagious laughter, and love of learning.

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Abstract

This scholarly practice project explored the impact of implementing educational protocols on the best practice quality metric for colorectal cancer screening rates. This project was conducted from August 2019 to October 2019. A quality improvement project was conducted at five primary care facilities. The participants included 39 health care providers and nursing staff members. The intervention did not yield a significant statistical difference between the average pre- and post- best practice quality metric (t-statistic = 2.44, t-critical = 2.77, $p < 0.07$). Although, there was a 56% increase in the overall number of screening methods ordered between all offices. The implementation of an educational protocol demonstrated that enhanced awareness regarding colorectal cancer screening methods, increases the overall number of colorectal cancer screenings ordered. Over a two-month period, the implemented educational protocol minimally improved the average best practice quality metric however, prolonged tracking is likely to improve this benchmark.

Keywords: colorectal cancer, colorectal cancer screening, primary care, health prevention

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Improving Colorectal Cancer Screening Rates in the Primary Care Setting

Chapter I

The third most common cancer in the world is colorectal cancer (Dodd, Mansfield, Carey, & Oldmeadow, 2018). Colorectal cancer has the third highest mortality rate (Bie & Brodersen, 2018). When detected in the early stages, there is a greater chance that the treatment of colorectal cancer can be curative (Slyne, Gautam, & King, 2017). About 90% of colorectal cancer cases occur in adults who are 50 years old or older (Ansa, Coughlin, Alema-Mensah, & Smith, 2018). The United States Preventative Services Task Force (USPSTF) recommends adults, starting at age 50 until age 75, participate in routine colorectal cancer screening (Ansa et al., 2018).

The lack of participation in colorectal cancer screening is a growing health care concern. One-third of the population in the United States is not current with the recommended colorectal cancer screening (Wheeler et al., 2018). Health prevention maintenance is a discussion that should be initiated in the primary care setting. Health care providers, especially those in the primary care setting, play an imperative role in delivering adequate education about colorectal cancer screening in order to reduce the morbidity and mortality related to colorectal cancer (Muliira, D'Souza, Ahmed, Al-Dhahli, & Al-Jahwari, 2016).

Background & Significance

The estimated rate of colorectal cancer is 20.6/100,000 in males and 14.3/100,000 in females, worldwide (Muliira et al., 2016). "In 2012, an estimated total of 1.4 million people were diagnosed with colorectal cancer, and this led to approximately 639,900 deaths" (Muliira et al., 2016, p. 99). Many colorectal cancer cases are found to be preventable when individuals participate in adequate screening measures at appropriate time intervals. According to the

USPSTF, there are multiple colorectal cancer screening options available for patients who are at average risk for colorectal cancer (Sava, Dolan, May, & Vargas, 2018). Invasive colorectal cancer screening methods include flexible sigmoidoscopy, double contrast barium enema, and colonoscopy (Sava et al., 2018). Noninvasive colorectal cancer screening methods include fecal immunochemical test, fecal occult blood test, and fecal DNA test (Sava et al., 2018). Despite the high risk of mortality from colorectal cancer and the multiple screening choices, the colorectal cancer screening rate remains low (Christy et al., 2018).

Of the 142 primary care providers surveyed in one study, more than 55% were unaware of the updated guidelines regarding the colorectal cancer screening methods available and the recommended frequency of each screening method (Muliira et al., 2016). Primary care providers are responsible for providing education to their average risk patients beginning at age 50 about the importance of colorectal cancer screening and the numerous screening options available. The benefits and risks of each screening method should be discussed with each patient. “The choice of screening method should be made using a shared decision-making process” (Sava et al., 2018, p. 601).

Needs Assessment

Locally, four of the five primary care offices are not currently meeting the benchmark for the best practice quality metric for colorectal cancer screening. The best practice quality metric for colorectal cancer screening tracks patients between the ages of 50 and 75 years who are up to date with their screening and whether they participated in a colonoscopy, Cologuard, or fecal immunochemical test (FIT) (Appendix A). The practice goal for each primary care facility is to achieve and maintain a colorectal cancer screening rate of 74% or more among their patient panel.

During August of 2019, only one of the five primary care facilities had a screening rate marginally above the benchmark of 74%. Health Clinic A, Health Clinic B, Health Clinic C, and Health Clinic D were below the benchmark at 66%, 64%, 68%, and 73%, respectively, compared to 76% of the patients at Health Clinic E (see Appendix A). Consequently, there is a significant opportunity to increase the rate of screenings at the four facilities not meeting the benchmark. In addition, the one office meeting the benchmark exceeded the benchmark by only two percent. Therefore, there is significant room to enhance the rate of colorectal cancer screenings at each of the five primary care facilities.

When colorectal cancer is found in the early stages, there is a greater chance that treatment interventions can potentially be curative (Slyne et al., 2017). The five-year survival rate of people with localized stage colorectal cancer is 90%, compared with cancer that has metastasized at 14% (American Cancer Society, 2019). If health care providers do not adequately educate their patients about the screening options available, patients are likely to assume the only way to meet the colorectal cancer screening recommendations is by participating in a colonoscopy. Common barriers preventing a patient from deciding to participate in a colonoscopy include the discomfort of the preparation process, the inconvenience of the examination, and the patient's belief that they are generally in good health (Bie & Brodersen, 2018).

A SWOT analysis was utilized by the Doctor of Nursing Practice (DNP) student to evaluate the internal strengths and weaknesses as well as the external opportunities and threats of this health care issue and practice project (see Appendix B for SWOT analysis diagram). Internal strengths include the substantial support from the evidence-based literature on the benefits of colorectal cancer screening, the ability to offer a variety of screening options, the motivation

from the administrative staff to improve their colorectal cancer screening rates, and health care providers commitment to provide high-quality, patient-centered care. An internal strength for patients includes the ability to choose which screening method to participate in to fulfill their recommended screening. An internal weakness includes the lack of willingness of the health care providers and nursing staff members to actively and continually participate in the practice project. An internal weakness for patients includes their willingness to follow through with the ordered screening method they selected. External opportunities include improved best practice quality metrics, improved patient health outcomes, and improved patient satisfaction. External threats include the limited time health care providers are allotted to spend with their patients and the need for additional training on evidence-based practice change.

Problem Statement

Colorectal cancer is a topic that health care providers commonly address during annual physical examinations or when a patient presents with pertinent symptoms. Most patients decline to participate in colorectal cancer screening without receiving adequate education about the screening methods available and the risks of choosing to not participate in a screening method (Bie & Brodersen, 2018). Four of the five primary care facilities were not achieving the desirable rate of patients fulfilling the recommended guidelines for colorectal cancer screening. The trend of these five primary care facilities will continue to fall below their benchmark of 74% or higher if patients do not receive adequate education about the importance of participating in colorectal cancer screening and the variety of screening methods available. Lack of participation in routine colorectal cancer screenings increases the risk of detecting colorectal cancer in the later stages when treatment is less likely to be curative (Saraste et al., 2018).

Project Purpose

This quality improvement project determined the success of implementing a protocol for education involving colorectal cancer screening. An educational in-service served as a reminder of the colorectal cancer screening methods available to fulfill the best practice quality metric set by the larger health system, provided patient education information about each screening method, instructions on how to accurately order each screening methods, and how to appropriately update the health maintenance section in the electronic health record (EHR) after the results were reviewed by the ordering health care provider.

The health care provider's role is to motivate patients to play an active role in their own health preventive maintenance by participating in a routine colorectal cancer screening that they select. The goal was to increase awareness regarding colorectal cancer screening choices to improve the rate of colorectal cancer screening to meet the best practice quality metric. The outcome was to determine whether implementing a protocol for education impacted the rate of patients participating in colorectal cancer screening in the primary care setting. Additionally, the trend of the number of new screening methods ordered for all colorectal cancer screening methods was assessed.

Clinical Question

In patients identified as due or overdue for colorectal cancer screening in the primary care setting (P), what effects does following a new protocol requiring primary care providers to educate their patients about the options of FIT testing, Cologuard, and the traditional colonoscopy (I) have on the number of patients participating in colorectal cancer screening (O) compared to exclusively offering the traditional colonoscopy (C), over a two month period (T)?

Congruence with Organizational Strategic Plan

Four of the five primary care facilities need to improve their colorectal cancer screening rates in order to meet the best practice quality metric benchmark. Improving colorectal cancer screening rates in the primary care facilities will align the health care system's strategic plan to develop a more regulated process to discuss, track, and evaluate colorectal cancer screening. The health care system's mission is to enhance the quality of life of their patients by promoting wellness and providing high-quality, patient-centered care. Increasing the colorectal cancer screening rates aims to improve the health outcomes of patients through early detection, leading to early initiation of necessary life-saving treatment interventions (Dodd et al., 2018).

Synthesis of Evidence

Throughout the pursuit to collect adequate information related to this scholarly practice project, multiple databases were studied. The relevant articles referenced were obtained from the Cochrane Library, Wiley Online Library, CINAHL, and Sage Journals. The keywords examined for pertinent evidence-based research articles include colorectal cancer screening, colorectal cancer, prevention, detection, primary care, and screening guidelines. The search was limited to publications within the past five years in order to review the most up-to-date principles. During the collection process, the studies selected focused on patients in the primary care setting and the role of the healthcare professional. Of approximately 40 studies reviewed, there were ten primary sources containing valuable material for this scholarly practice project.

These research studies support the importance of overcoming barriers in order to successfully improve the rate of colorectal cancer screenings. There are multiple barriers that impair adequate rates of colorectal cancer screening. Thirty-five percent of the 416 participants in the clinic-based colorectal cancer screening intervention study, reported having moderate-to-

high levels of worry regarding colorectal cancer screening (Christy et al., 2018). A study led by Smith, Alema-Mensah, Yoo, Ansa, and Blumenthal (2017), found 67% of participants did not seek or obtain screening, despite receiving the evidence-based intervention, due to perceived stress, attitudes, beliefs, barriers, and social support. In addition, a qualitative study completed by Bie and Brodersen (2018) evaluated 42 reasons why patients refuse to have colonoscopies. The 42 reasons were developed into nine separate categories including practical barriers, discomfort of the examination, personal integrity, multi-morbidity, feeling healthy, not having the energy, belief that cancer is not present, risk of complications, and distrust in the accuracy of the iFOBT (Bie & Brodersen, 2018). The Kirkoen et al. (2017) study reported 22% of women reported pain during flexible sigmoidoscopy compared to 5% of men, leading to an unwillingness to participate in repeat screenings. One barrier is the perceived cost. Insurance coverage plays an influential role in whether individuals participate in initial screenings. If given a free voucher to avoid costs, uninsured individuals will be more likely to participate in colorectal cancer screenings (Lich et al., 2017).

Many of the barriers can be overcome by offering other screening methods. When a patient is given multiple screening options, they are more likely to participate (Bie & Brodersen, 2018). The Sava et al. (2018) study explains that patients' participation increased when they were given two screening options such as FIT testing, Cologuard, or colonoscopy. A patient with a positive attitude towards colorectal cancer screening will be more likely to complete the screenings (Brandhof et al., 2018).

Individuals with low literacy rates are at increased risk of not accurately understanding the significance of participating in colorectal cancer screening (Woudstra et al., 2018). Of the 22 individuals studied, 20% who had positive FIT tests and low literacy rates did not participate in a

colonoscopy, the recommended follow-up procedure (Woudstra et al., 2018). In addition to literacy rates, culture influences colorectal cancer screening rates. In order to improve colorectal cancer screening rates, healthcare providers must consider cultural norms, tailoring personalized communication (Mojica, Parra-Medina, & Vernon, 2018).

There is an emphasis on health promotion and prevention in the primary care setting. The study led by Dodd et al. (2018), discovered that 41% of the 663 participates were under-screened in the outpatient setting. It is the responsibility of the primary care provider to increase patient awareness and participation in colorectal cancer screenings (Slyne et al., 2017). Healthcare professionals can successfully accomplish this by understanding their patients' attitudes and concerns towards colorectal cancer screening as well as provide their patients with multiple screening method options. Seventy-one percent of the 142 healthcare professionals queried reported that their cancer treatment and prevention training was insufficient (Muliira et al., 2016). In addition to inadequate training Muliira et al. (2016) found that only 26% of healthcare professionals routinely engage in activities to improve their knowledge about cancer treatment and prevention. Healthcare professionals should be accountable to initiate the conversation about colorectal cancer screening because individuals who seek routine care from their primary care provider are more likely to participate in regular colorectal cancer screenings, as recommended (Halm et al., 2016). It is essential healthcare professionals receive proper and routine continuing education in order to successfully provide high quality, patient-centered care related to up-to-date screening guidelines.

Initial patient participation in colorectal cancer screening in crucial. The study led by Saraste et al. (2018) assessed the likelihood of patients participating in routine, consistent colorectal cancer screening. Eighty-four percent of participants who completed their initial

screening also completed their subsequent screening (Saraste et al., 2018). Furthermore, 93% of participants who completed their second round of screening also completed their third round of screening (Saraste et al., 2018). Since patient participation in the initial screening is a powerful predictor of future patient participation, overcoming the barrier of initial screening participation is essential to enhance colorectal cancer screening rates. Healthcare professionals must provide proper education and screening methods that are individualized for each patient.

Multiple cost-benefit analyses have shown that intervention costs are worth the outcome of improving colorectal cancer screening rates. Interventions such as social media outlets, handouts, and postcards have shown to be effective in improving colorectal cancer screening rates. Colorectal cancer screening rates were 10% higher in the group receiving promotional advertisements compared to the control group (Lairson, Kim, Byrd, Salaiz, & Shokar, 2018). The impact of mailed reminders and media campaigns were evaluated in the study lead by Lich et al. (2017) to determine the impact on the number of individuals participating in colorectal cancer screening. Participation in colorectal cancer screening increased from 41,709 to 145,821 in individuals who received mailed reminders and who were exposed to the media campaign (Lich et al., 2017). Of the 1,011 individuals surveyed with health insurance, people who received two reminder postcards were 2.3 times more likely to schedule their colorectal cancer screening compared to those who received one reminder postcard (Troyer, Williamson, Merchant, & Lengerich, 2014). Facebook is a social media outlet that has been used to raise awareness about colorectal cancer and the importance of remaining up to date with screenings (Brittain, Kamp, & Salaysay, 2018). While there is a variety of intervention styles, there is no significant difference in the outcomes between web-based and print-based educational interventions (Weinberg et al., 2013).

The evidence shows that primary care providers play a critical role in whether or not patients participate in colorectal cancer screening. There are many patients who do not desire to go through the process of a colonoscopy and have limited knowledge regarding the other screening methods. There is adequate evidence to support the need to improve colorectal cancer screening rates by primary care providers by offering multiple screening options.

Theoretical Framework

The model that guiding this practice project is the Health Belief Model. The Health Belief Model speculates the reason individuals may or may not participate in health care prevention activities (Jones et al., 2015). Colorectal cancer screening is a health care preventive action aimed at detecting colorectal cancer risk or the early stages of colorectal cancer, leading to improved health outcomes. This model explains that optimal behavior change can be achieved by targeting the perceived barriers, perceived benefits, perceived threats, self-efficacy, and cue to action (Jones et al., 2015). Colorectal cancer was the perceived threat, achieving an adequate colorectal cancer screening rate was the perceived barrier, early detection of colorectal cancer was the perceived benefit, self-efficacy was the ability to choose the screening method, and the cue to action was the practice project implementation. The primary care provider is responsible for impacting the patient to modify their behavior. Education focused on options, benefits, and personal choices will help to empower patients to follow through with colorectal cancer screening.

Chapter II: Methods

Project Design

Sixteen primary care providers and 23 nursing staff members from five primary care facilities were offered the opportunity to participate in the quality improvement project. Thirty-nine individuals were willing to participate in the project and signed an informed consent document (see Appendix C for consent form). The primary care providers and nursing staff members were expected to participate in the practice project change guided by the DNP student over a two-month period during September 2019 and October 2019. The five primary care facilities were selected for this quality improvement project because the primary care setting plays a vital role in health prevention and maintenance. The project design focused on evaluating whether implementing a protocol for education would increase the number of patients who participate in routine colorectal cancer screening.

Setting

The DNP student obtained approval from the research and grants committee of the affiliated health care system to initiate this quality improvement project at the five primary care facilities (see Appendix D for the approval letter). The five primary care facilities are in five separate towns spread across 60 miles in the same state on a coastal barrier island along the east coast. The location of each medical facility was conducive to safely carry out the processes of this project and amenable due to the subject population. Each primary care facility had the ability to perform the steps of this project.

Population/Sample

As of September 2019, the total patient panel size comprised of 9,024 individuals who met the criteria for the best practice quality metric guidelines for colorectal cancer screening (see

Appendix E for practice panel sizes). The inclusion criteria included patients between the age of 50 and 75 years old who were due for routine colorectal cancer screening, despite whether they had participated in any prior screening. The exclusion criteria included patients who required a diagnostic measure for colorectal cancer. The 39 health care providers and nursing staff members were responsible for evaluating the status of each patient, by referencing the health maintenance section in the EHR, during each office visit during September 2019 and October 2019.

Tools/Instruments

Two tools were created for the DNP student to use as training material during each in-service when educating the health care providers and nursing staff members. The PCP Cologuard Procedures (see Appendix F) and the PCP FIT Procedures (see Appendix G) outlines how to properly order the chosen screening method, how to adequately update the health maintenance section in the EHR, as well as what supplies are needed for each method. The training materials also served as a reference tool for the health care providers and nursing staff members throughout the implementation process.

In addition to the training materials, there were three patient educational tools developed. The Cologuard Colorectal Screening Test (see Appendix I), the FIT Colorectal Screening Test (see Appendix J), and the Colonoscopy Screening Test (see Appendix K) were educational tools for the health care providers and nursing staff members to provide to patients when the patient declined the traditional colonoscopy. These documents included education regarding each screening method process, the recommended next steps based on the results, and related insurance coverage information for each screening method. These documents also served as a consent form for patients to sign once they have decided which screening method they preferred. Permission to use the PCP Cologuard Procedures, PCP FIT Procedure, Cologuard Colorectal

Screening Test, FIT Colorectal Screening Test, and Colonoscopy Screening Test educational materials, was granted by the manager of regional operations for the five primary care facilities (see Appendix H for permission letter).

Project Plan

The first step of this quality improvement project required the DNP student to undergo proper training on how to order each screening method and the proper way to update the health maintenance section in the EHR. The DNP student received training by one of the general surgeons affiliated with the primary care facilities about which screening method is appropriate based on patient history. The DNP student then collected the colorectal cancer screening best practice quality metric rates and the number of screening methods ordered for each practice during August 2019. The best practice quality metric rate for colorectal cancer screening captures the percentage of patients who are fulfilling their routine screening at the end of every month and the metric was obtained from the dashboard of the EHR. The number of screening methods ordered per office was obtained by running two reports, XXXX Colon and XXXX Colorectal Project, that were created by the DNP student.

Next, the DNP student held in-services at each primary care facility to initiate the educational protocol, and to share the purpose and goals of this quality improvement project. The in-services were held at each office during the regularly scheduled workday reaching all 39 participants over a one-week period. The DNP student obtained completed informed consent documents from each of the health care providers and nursing staff members which demonstrated they were aware that their activity regarding colorectal cancer screening was being tracked and analyzed. Once all the primary care facilities received the thorough training the

practice change was implemented. The initiation of the practice change began on the same date at each primary care facility and continued for two months.

Once the practice change was initiated, the health care providers and nursing staff members were encouraged to evaluate whether each patient was due or overdue for their routine colorectal cancer screening by referencing the health maintenance section in the EHR, regardless of whether the patient had participated in any previous screenings. The education provided was solely for screening purposes, diagnostic measures were excluded. Once the health care provider determined a patient was due or overdue for their screening, they were responsible for initiating the conversation regarding screening methods available, including Cologuard, FIT test, and colonoscopy. Depending on which screening method the patient selected, a health care provider or a nursing staff member used the Cologuard Colorectal Screening Test document, the FIT Colorectal Screening Test, or the Colonoscopy Screening Test document as a reference educational tool to educate the patient.

The DNP student verified each primary care office had a plan in place to ensure the health maintenance section was being updated once the results were received and reviewed by the ordering health care provider. The DNP student was available by email and phone, information which was provided during the in-services, for any questions throughout the implementation process. The DNP student ran the reports, XXXX Colon and XXXX Colorectal Project, to collect the number of colorectal cancer screening methods ordered by each office on a weekly basis for two months. The DNP student emailed the participants weekly for two months to share the number of screening methods ordered by their office to encourage motivation. At the completion of month two, the DNP student collected the colorectal cancer screening best practice quality metric for each office. The DNP student organized the number of screening methods

ordered for each office by month for the first and second month of the practice project, occurring during September 2019 and October 2019. The primary care facility ordering the most screening methods during the implementation process was awarded an inducement of minimal monetary value by the DNP student.

Potential barriers of this practice project included time restrictions on health care providers to initiate a conversation about colorectal cancer screening when patients presented to the office for any other type of visit other than an annual physical exam, human error when updating the health maintenance section in the EHR, and unchanged patient behavior, such as failing to follow through with the ordered screening method.

The office managers were supportive in the implementation of the practice project and displayed a willingness to continue the practice change if it yielded statistically significant outcomes. The practice project is sustainable if a current employee is appointed the responsibility to continue weekly tracking and data report sharing via motivational emails. The practice project is likely to have quality longevity if the health care providers received incentives on their colorectal cancer screening best practice quality metrics. An extended practice change will likely assist in the prevention of the regression of the best practice quality metric.

Data Analysis

The DNP student measured the success of the practice change by comparing the colorectal cancer screening best practice quality metric of each office pre- and post-implementation of the educational protocol. The DNP student compared the average best practice quality metric from prior to and after the implementation process using a paired t-test. The DNP student assessed the trend of the number of screening methods ordered by each office by comparing the number of screening methods ordered the month prior to initiating the practice

change, the number of screening methods ordered during the first month of the practice change, and the number of screening methods ordered during the second month of the practice change. Additionally, the DNP student assessed the trend of the overall number of screening methods ordered prior to initiating the practice change, the number of screening methods ordered during the first month of the practice change, and the number of screening methods ordered during the second month of the practice change.

Specific patient-related data was not collected or used in this practice project, only aggregate data was tracked and evaluated. The DNP student used quantitative methods to assess the aggregate data to determine if there was a significant difference in the best practice quality metric and the number of screening methods ordered. The DNP student assumed that any improvement in the best practice quality metric or the number of screening methods ordered during the tracking period was directly related to the practice project.

Institutional Review Board/Ethical Issues

The rights of the patients involved were protected and their information was kept confidential. The patients were not selected based on their gender, ethnicity, comorbidities, or socioeconomic status. The patients were selected solely based on their need to update their colorectal cancer screening status. The patients had the right to decline participation in any of the three available screening methods after receiving thorough education. Health Insurance Portability and Accountability Act (HIPPA) was maintained since only the health care providers and nursing staff members involved in the patient's care were accessing the patient's individual record in the EHR. The health care providers and nursing staff members signed an informed consent document indicating they were aware that their activity regarding colorectal cancer screenings was being tracked and analyzed. The employment status of the health care providers

and nursing staff members was not impacted by their participation in the practice change. The DNP student submitted an application to the Bradley University Committee on the Use of Human Subjects in Research for the quality improvement project under exempt category three and formal approval was obtained in May 2019 (see Appendix L for the approval notice).

Chapter III: Organizational Assessment & Cost Effectiveness Analysis

Organizational Assessment

The office managers of the five primary care facilities were prepared and motivated to improve the best practice quality metrics for colorectal cancer screening. Some of the other best practice quality metrics, such as breast cancer screening, have an added financial incentive for the health care providers when the benchmark is met. Colorectal cancer screening is not one of the best practice quality metrics with a financial incentive, but it is likely to in the future. An anticipated barrier of this practice project was to maintain adequate motivation from all participants during the two-month timeframe. The DNP student provided continued motivation by sending weekly check-in emails to all the participants. An additional motivational factor included the small reward of minimal monetary value awarded to the office ordering the most colorectal cancer screenings by the end of the two-month period. An anticipated barrier was requiring the health care providers and nursing staff members to alter their duties, though minimal, without receiving additional long-term personal compensation. There were no clear risks or unintended consequences associated with the practice project. The practice project involved interprofessional collaboration between the DNP student, the health care providers, the nursing staff members, the office managers, the administration staff, and the patients, to provide high quality, patient-centered care.

Cost Factors

There was no specific budget required for the practice project since the participants were already employed by the five primary care facilities and the activities were part of their daily work routine. The in-services provided by the DNP student were given on a volunteer basis to the participants during their regularly scheduled workday. Any unexpected expenses were

absorbed by the existing operational budget. The small monetary gift awarded to the office ordering the most colorectal cancer screening methods during the tracking period was voluntarily supplied by the DNP student.

The practice project had the potential for cost avoidance and cost savings. Early detection of colorectal cancer from participation in routine screenings is associated with cost avoidance. Patients who are diagnosed with colorectal cancer in the earlier stages and who choose to seek treatment intervention will reduce their cost of necessary therapies compared to patients who receive a diagnosis of colorectal cancer in advanced stages who also choose to undergo treatment. Patients can avoid additional expenses by participating in routine colorectal cancer screening.

Since the patients were receiving education about the three available colorectal cancer screening methods, they had the ability to select the screening method based on their insurance coverage to reduce their personal expenses. Depending on the patient's insurance coverage, they can select to participate in the screening method that would be least expensive (Lairson et al., 2018). While colorectal cancer screening methods may require some cost depending on the patient's insurance coverage, participating in routine screening will likely reduce the patient's cost of care later in life (Lairson et al., 2018). For example, if polyps are discovered during a routine screening colonoscopy, the polyps will be removed, potentially preventing patients from having to undergo additional diagnostic procedures they would likely be more expensive.

Chapter IV: Results

Analysis of the Implementation Process

The DNP student successfully completed the initial stage of the implementation process by collecting the best practice quality metric and number of total screening methods ordered per office for August 2019 prior to initiating the practice change. The second stage of the implementation process was successful as the DNP student held educational in-services and obtained informed consent from the health care providers and nursing staff members at each office. An issue was discovered after the first week of the weekly data report sharing. One of the participants noticed that the original reports, XXXX Colon and XXXX Colorectal Project, were not capturing all the orders completed. The DNP student was able to successfully resolve this issue by altering the details that the reports were capturing. The DNP student re-ran the reports for the month of August and for the first week of the implementation process in order to collect the accurate aggregate data. The DNP student was then successful collecting in the number and type of screening methods ordered each week and shared the aggregate data with the health care providers and nursing staff members. There were mixed reviews of the weekly data sharing emails from the health care providers as to whether they were effective in encouraging ordering of colorectal cancer screenings. Some providers felt the emails were effective as they served as both a reminder and motivation to initiate the conversation about the colorectal cancer screening methods available with patients who are due or overdue for their routine screening. Other providers reported the emails did not make a difference and they would have initiated the conversation about the colorectal cancer screening methods available with patients who were due or overdue for their routine screening whether they received the weekly data email or not. The DNP student sent out the weekly data reports at the end of each week for two months as

originally planned. At the end of month two, the DNP student collected the best practice quality metric percentage as well as the total number of screening methods ordered for September 2019 and October 2019.

One modification made to the initial implementation plan during the project was the use of the Cologuard Colorectal Screening Test, the FIT Colorectal Screening Test, and the Colonoscopy Screening Test documents. The manager of regional operations for the five primary care facilities advised the DNP student to remove the informed consent section of these documents as it is not required step for health care providers or nursing staff members to carrying out the ordering of and completion of any of the colorectal cancer screening methods. Instead, the health care providers and nursing staff members were directed to use the Cologuard Colorectal Screening Test, the FIT Colorectal Screening Test, and the Colonoscopy Screening Test documents at their discretion to educate and assist their patients in making an informed health decision on which screening method is preferred. Another modification made to the initial implementation plan during the project was not requiring only one volunteer nursing staff member to update the best practice health maintenance section in the EHR. Originally, the DNP student planned to initiate the action plan for updating the health maintenance section of the EHR once the results were received. The DNP student was going to select one volunteer nursing staff member from each office to update the health maintenance section once the results were reviewed by the ordering health care provider. Since not all nursing staff members work every day, the DNP student reviewed the current plan established by each office. For example, in one office the health care providers like to update the health maintenance section themselves, whereas, in another office, the nursing staff members take on this role. The DNP student encouraged each office to use the plan that works best for their facility. The DNP student

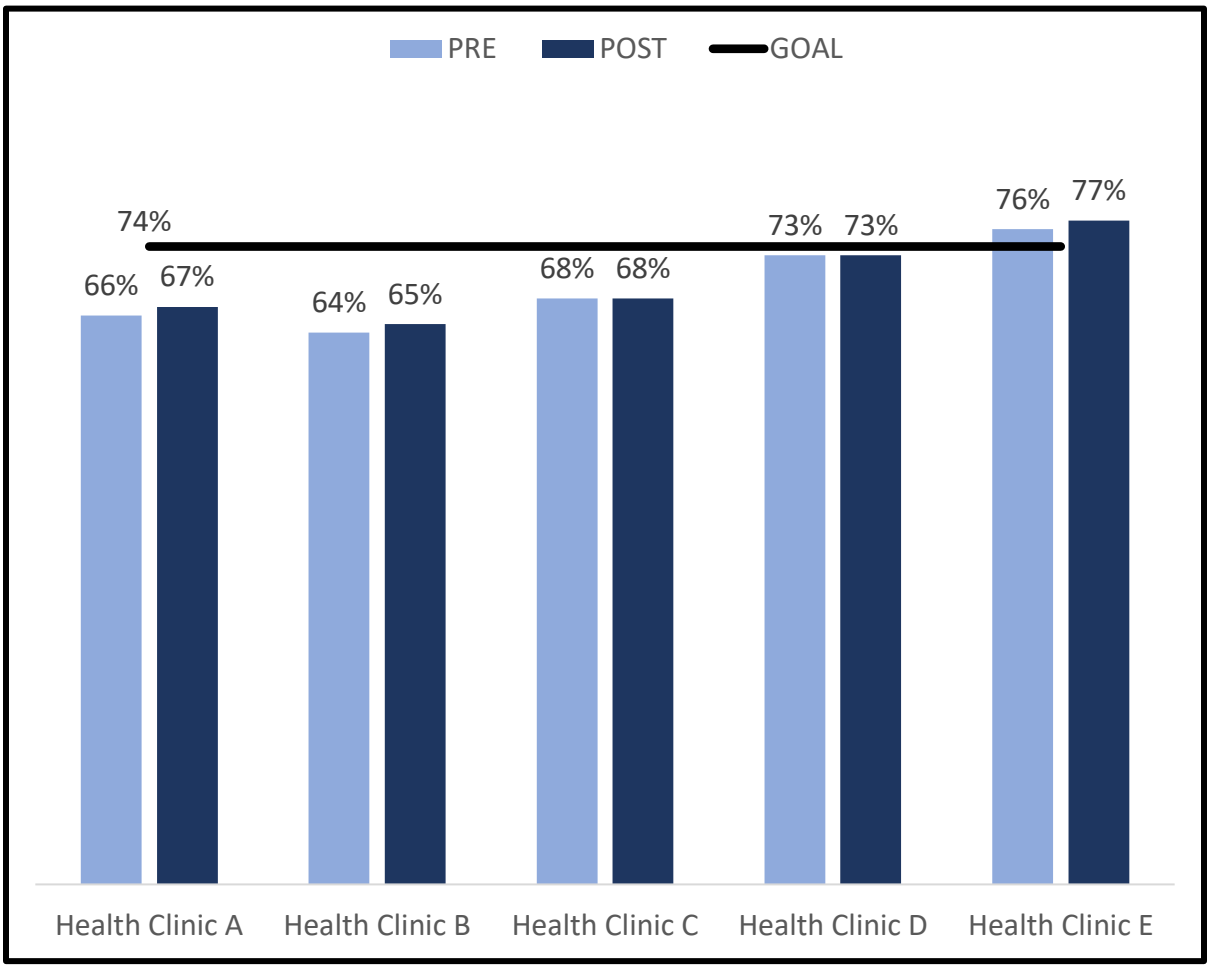
verified a plan was in place at each office to ensure the health maintenance section of the EHR was accurately updated.

The DNP student learned the process of how to accurately develop reports to yield the aggregate data of the number of screening methods ordered. Another lesson learned was that although the offices are affiliated with the same health care organization, the staffing and workflow differ from office to office. The DNP student also learned that initiating practice change is likely to be more accepted and successful when unnecessary additional steps are avoided.

Analysis of Project Outcome Data

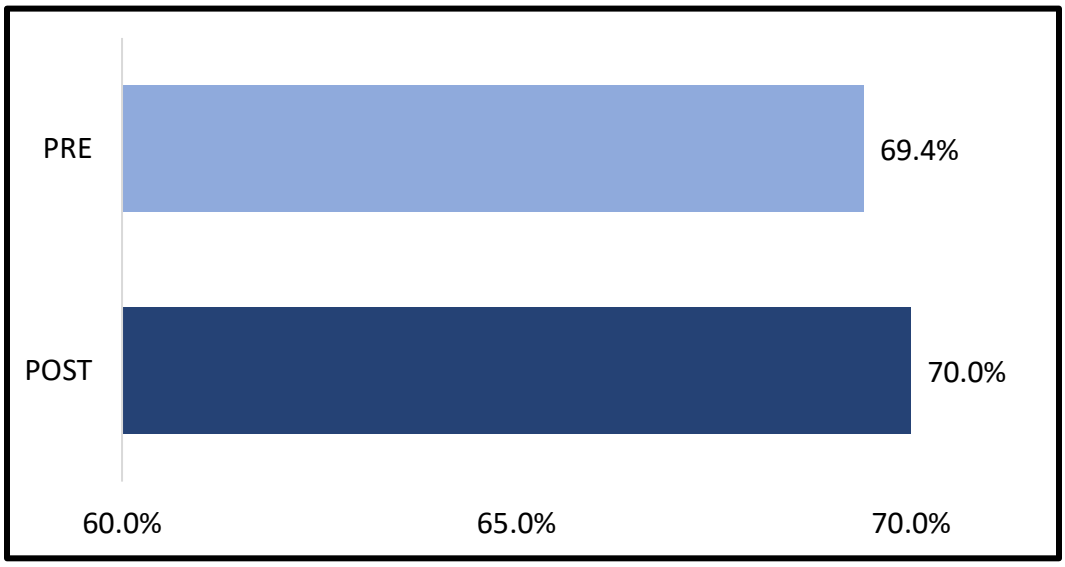
There was a minimal improvement in the best practice quality metric prior to and after implementing the practice change (see Figure 1). The Health Clinic A, Health Clinic B, and Health Clinic E showed a one percent improvement in their best practice quality metric during the two-month timeframe. The Health Clinic C and the Health Clinic D did not show any improvement or decline in their best practice quality metric, but they maintained the same standing during the two-month timeframe. Only one office, the Health Clinic E, was meeting the best practice quality metric goal of 74% prior to the practice change and was the only office to meet the best practice quality metric benchmark after the practice change.

Figure 1.



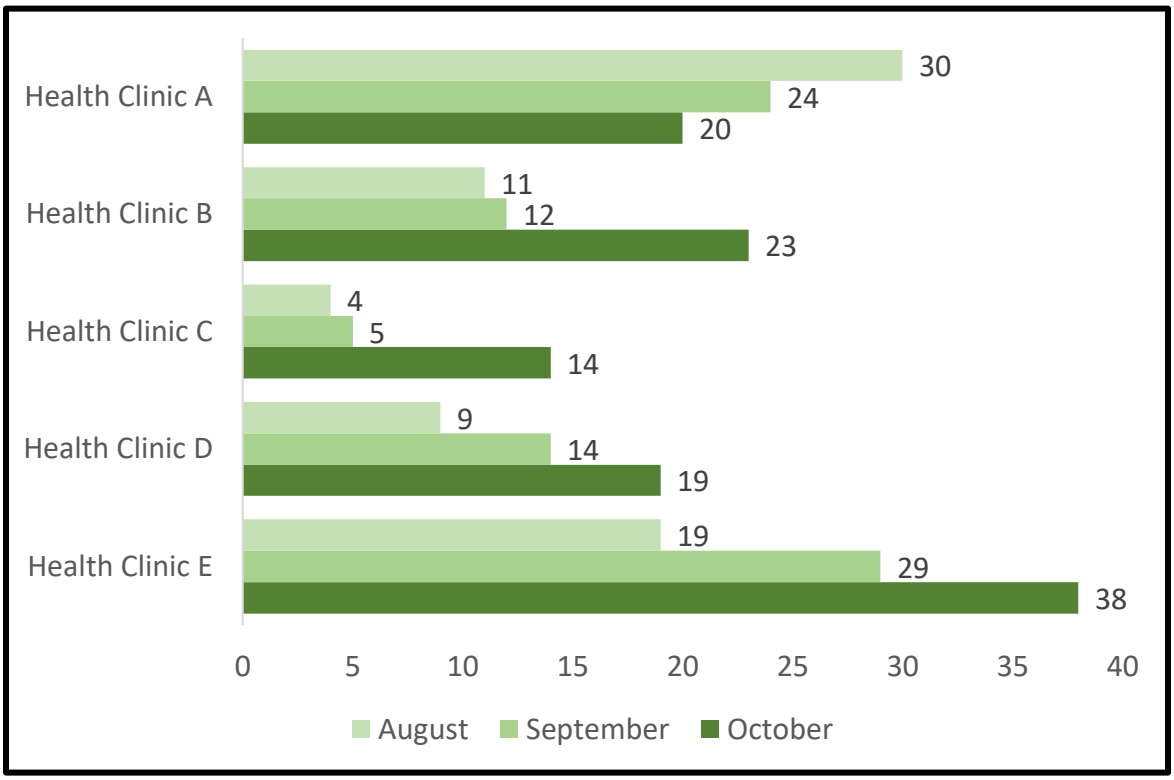
The average best practice quality metric of the five primary care facilities improved from 69.4% prior to implementing the practice change to 70% after implementing the practice change (see Figure 2). Due to the short timeframe between the pre- and post- data, the positive change from the intervention did not yield a significant statistical difference between the average pre- and post- best practice quality metric rates (t-statistic = 2.44, t-critical = 2.77, $p < 0.07$).

Figure 2.



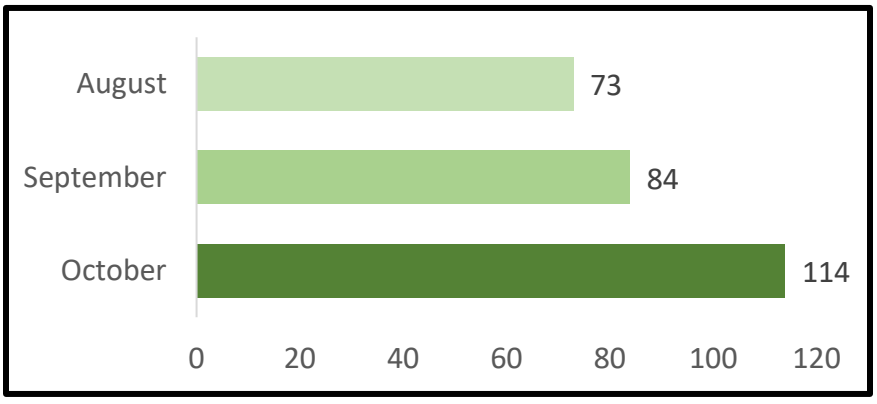
While the best practice quality metric did not exhibit a significant statistical difference, the number of colorectal cancer screening methods ordered displayed a significant increased over the two-month period in four of the five offices (see Figure 3). Health Clinic B, Health Clinic C, Health Clinic D, and Health Clinic E demonstrated a substantial increase by 109%, 250%, 111%, 100%, respectively, in the number of screening methods ordered from August 2019, before the practice change, to September 2019 and October 2019, during the practice change. Health Clinic A serves as the outlier in the data set as it was the only office that did not exhibit an increase in the number of screening methods ordered. Health Clinic A demonstrated a 33% decrease in the number of screening methods ordered from August 2019 to October 2019.

Figure 3.



Despite Health Clinic A serving as an outlier, the overall number of screening methods ordered at the five primary care facilities exhibited continued improvement from August 2019 to September 2019 to October 2019 (see Figure 4). There was a 56% increase in the overall number of screening methods ordered between all offices. No data was missing from the collection and analyzation process.

Figure 4.



Chapter V: Discussion

Summary of Findings

Although the average best practice quality metric did not significantly improve over the two-month tracking period, the overall number of screening methods ordered did significantly improve after the implementation of the educational protocol. Many of the health care providers and nursing staff members were motivated by the weekly data report emails. The weekly data report emails served as a reminder to the health care providers and nursing staff members to be attentive in determining whether their patients were due or overdue for routine colorectal cancer screening despite the reason for the visit. Health Clinic A was the outlier in the data set regarding the number of screening methods ordered. Health Clinic A had a health care provider out of the office for 22 days total during the months of September and October leading to the decreased trend in the number of screening methods ordered. The other health clinics did not experience a significant health care provider absenteeism. Additionally, Health Clinic A did not order any FIT tests during the tracking period causing them to be an outlier in the data set. A potential reason for the lack of FIT testing ordered at Health Clinic A appears to be because this office did not have the same FIT test laboratory kit the other offices utilized, which caused the office manager to advise the health care providers and nursing staff members to hold off on ordering FIT tests until laboratory details were resolved.

Limitations

The quality improvement project confirmed that increased awareness leads to an increase in the number of colorectal cancer screening methods ordered. A potential project design flaw includes providing separate in-services at each office rather than the same educational training on the same day at the same time for each office. One limitation of tracking the best practice

quality metric for colorectal cancer screening is the data only includes the screening methods that are completed and resulted appropriately during the project tracking period and the data was only tracked over a two-month period. The patients have limited local resources as these primary care facilities are geographically isolated. There is only one local facility with two general surgeons who perform colonoscopies, causing there to be a delay in the time between when a colonoscopy is ordered and when it is completed. The average time between a colonoscopy being ordered and when it is completed is about six to eight weeks. This time delay clarifies why the best practice quality metric and the number of screening methods ordered within the same month do not directly correlate with one another. Since the best practice quality metric was only evaluated after a two-month period, the patient likely did not have the opportunity to participate in the screening method within the tracking timeframe. An additional limitation includes the behavioral change of the patients and health care providers. Regardless of receiving an adequate education, patients could still choose whether they are going to participate in the selected screening method. While health care providers understand the importance of colorectal cancer screening, not all health care providers initiate the conversation health preventative measures during every patient appointment due to limited allotted time.

Implications

Practice. The primary care offices could designate an employee to champion this initiative and continue to track and share data to sustain the practice change and continue to provide motivation. Since the overall number of screening methods has increased, it is appropriate to assume if the best practice quality metric was tracked over a longer period, there would be a statistically significant improvement in the best practice quality metric. Another potential project implementation modification would be to hold one large in-service with all

participants to remove any potential biases. Additionally, the general concept of the quality improvement practice project could be carried over to other primary care facilities. The implementation of the detailed educational protocol could be easily transferable to other primary care facilities that use the same EHR.

Future work. The DNP student plans to evaluate the aggregate data of all five primary care facilities at 12 and 16 weeks from the completion of the practice project to determine the impact of the increased number of screening methods ordered during the month of October and to allow sufficient time for the average results to be documented in the EHR. Potential areas to investigate and improve during future practice change include determining when a health care provider can realistically address the health maintenance section of the EHR due to time constraints during certain visit types, such as same-day sick visits, and how to reflect this in the health maintenance section of the EHR.

Nursing. This quality improvement practice project has important significance to the nursing profession. The nursing profession focuses on providing high-quality, patient-centered care through advocacy. It is essential to provide adequate education about the colorectal cancer screening methods available for patients to make informed decisions about which screening method they would prefer and likely participate in. Family nurse practitioners in the primary care setting should address health maintenance prevention, such as colorectal cancer screening, resourcefully during each patient appointment.

Health policy. Since there are multiple screening methods that fulfill colorectal cancer screening, such as colonoscopies, FIT testing, and Cologuard, every primary care facility should have access to offer each screening method to their patients. This quality improvement practice project launches the foundation for further improvement in colorectal cancer screening rates in

the primary care setting. Minimal practice change has demonstrated that enhanced awareness increases the number of colorectal cancer screening methods ordered. With more regulated reform of the delivery of care by the health care system, there is an increased likelihood of improving colorectal cancer screening rates. If the practice findings elicited statistically significant improvement when tracked over a longer period, it has the potential to lead to lasting health care system transformation.

Chapter VI: Conclusion

Value of Project

Colorectal cancer is the third most common cause of cancer in the world and has the third highest mortality rate of all cancers (Bie & Brodersen, 2018). Participating in health prevention strategies, such as colorectal cancer screening, can improve health outcomes. The implementation of an educational protocol demonstrated that enhanced awareness regarding colorectal cancer screening methods increases the overall number of colorectal cancer screenings ordered. Over a two-month period, the implemented educational protocol minimally improved the average best practice quality metric, however, prolonged tracking is likely to see an increase in the average best practice quality metric.

DNP Essentials

The DNP Essentials outline the core competencies for advanced practice registered nurses to build upon their professional foundation. DNP Essential I: Scientific Underpinnings for Practice was successfully met through utilizing scientific theories to develop a means for health care providers and nursing staff members to effectively communicate with the patient about the colorectal cancer screening methods available and the importance of participating in a screening routinely (American Association of Colleges of Nursing, 2006). This quality improvement practice project fulfilled DNP Essential I through motivating health care professionals to encourage their patients to make informed health care decisions that will make a positive impact on their overall well-being (American Association of Colleges of Nursing, 2006).

DNP Essential II: Organizational and Systems Leadership for Quality Improvement and Systems Thinking was successfully met by focusing on the need of the patient population (American Association of Colleges of Nursing, 2006). This practice project was created to

determine the impact of a change in the delivery care model to meet the needs of a target population. This practice project also fulfilled DNP Essential II by enhancing the quality of care, therefore ensuring patient quality and safety (American Association of Colleges of Nursing, 2006). The health care professionals upheld patient safety by educating their patients about the benefits of participating in an evidence-based screening method.

DNP Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice was successfully met by initiating a practice change based on relevant findings of evidence-based practice (American Association of Colleges of Nursing, 2006). This practice change was designed to promote safe, effective, patient-centered care by allowing patients which screening method they would prefer to participate in. This practice change was developed with the intent to improve the number of patients fulfilling their colorectal cancer screening to meet the practice's benchmark.

DNP Essential IV: Informative Systems/Technology and Patient Care Technology for the Improvement and Transformation of Health Care was successfully met by utilizing technology to build the reports used to accurately and effectively retrieve the aggregate data (American Association of Colleges of Nursing, 2006). The aggregate data collected through the report feature of the EHR was used to evaluate the outcomes of the practice change. This practice project also fulfilled DNP Essential IV because the DNP student used technology to communicate the weekly data reports with the health care professionals to provide continued motivation and active awareness.

DNP Essential V: Health Care Policy for Advocacy in Health Care was successfully met because the educational protocol was developed to assist with the health care system's policy to meet the colorectal cancer screening benchmark (American Association of Colleges of Nursing,

2006). The educational protocol addressed the care delivery issues through fostering effective communication about the available screening methods. The DNP student fulfilled DNP Essential V by demonstrating effective leadership skills by developing and implementing the health care delivery practice change as well as evaluating the impact of the practice change.

DNP Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes was successfully met by the DNP student employing interprofessional collaboration between the manager of regional operations, office managers, health care providers, and nursing staff members of five primary care facilities (American Association of Colleges of Nursing, 2006). The educational protocol provided practice guidelines for the health care professionals to follow. The practice change was developed by the DNP student to create positive change in the complex health care delivery system.

DNP Essential VII: Clinical Prevention and Population Health for Improving the Nation's Health was successfully met through the key purpose of this quality improvement practice project (American Association of Colleges of Nursing, 2006). The practice project was established to promote health and reduce preventable risks. Since health prevention interventions are commonly underutilized, such as colorectal cancer screenings, the DNP student developed an educational protocol to alter the care delivery approach and minimize the gaps in care to ensure.

DNP Essential VIII: Advanced Nursing Practice was successfully met by informing the health care professionals of the practice outcomes and how the education they provide has consequences on the patient's care (American Association of Colleges of Nursing, 2006). The DNP student developed and sustained relationships with the health care professionals involved in the practice change. The DNP student also fulfilled DNP Essential VIII by designing, delivering, and evaluating an evidence-based educational protocol to initiate practice change to improve

patient health outcomes (American Association of Colleges of Nursing, 2006). This quality improvement practice project allowed the DNP student to demonstrate specialized knowledge, responsibility, and accountability in the management and care of health care professionals and patients.

Plan for Dissemination

The DNP student is scheduled to complete a virtual PowerPoint presentation with the department of nursing in the graduate school of Bradley University for partial fulfillment of the degree requirements. The DNP student will also complete a poster presentation with the quality department and administrative staff of the affiliated organization to share findings.

Attainment of Personal & Professional Goals

This quality improvement practice project has assisted the DNP student in reaching personal and professional goals. This project has provided a venue for the DNP student to strengthen her leadership skills and her ability to analyze aggregate data. The DNP student has gained a better understanding of the impact health care systems and health care policies have on practice change. This project has allowed the DNP student to demonstrate her ability to practice and lead a group of health care professionals at the highest level of clinical nursing practice. The DNP student's personal goal is to graduate from Bradley University's DNP – Family Nurse Practitioner (FNP) program in December of 2019. The DNP student intends to work as an FNP in the primary care setting practicing evidence-based health care, with a future goal of becoming a faculty member of an accredited program. The DNP student plans to take the necessary steps in order to successfully publish her work in a scholarly journal.

References

American Association of Colleges of Nursing (2006). The essentials of doctoral education for advanced nursing practice. Retrieved from http://www.aacnnursing.org/Portals/42/ Publications /DNPEssentials.pdf

American Cancer Society (2019). Cancer facts and figures 2019. Retrieved from https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2019.html

Ansa, B. E., Coughlin, S. S., Alema-Mensah, E., & Smith, S. A. (2018). Evaluation of colorectal cancer incidence trends in the United States (2000–2014). *Journal of Clinical Medicine*, *7*(2), 22. Retrieved from http://doi.org/10.3390/jcm7020022

Bie, A. K. & Brodersen, J. (2018). Why do some participants in colorectal cancer screening choose not to undergo colonoscopy following a positive test result? A qualitative study. *Scandinavian Journal of Primary Health Care, 36*(3), 262-271. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1080/02813432.2018.1487520

Brandhof, S. D., Fagerlin, A., Hawley, S., Toes-Zoutendijk, E., Trevena, L., McCaffery, K., & Korfage, I. J. (2018). Colorectal cancer screening: Associations between information provision, attitudes, and intended participation. *Patient Education & Counseling, 101*(3), 546-550. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1016/j.pec.2017 .08.021

Brittain, K., Kamp, K. J. P., & Salaysay, Z. (2018). Colorectal cancer awareness for women via Facebook: A pilot study. *Gastroenterology Nursing, 41*(1), 14-18. Retrieved from https://insights-ovid-com.ezproxy.bradley.edu/crossref?an=00001610-201801000-00002

Christy, S. M., Schmidt, A., Hsiao-Lan, W., Sutton, S. K., Davis, S. N., Chavarria, E., …Gwede, C. K. (2018). Understanding cancer worry among patients in a community clinic-based colorectal cancer screening intervention study. *Nursing Research, 67*(4), 275-285. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1097/NNR.0000000000000275

Dodd, N., Mansfield, E., Carey, M., & Oldmeadow, C. (2018). Prevalence of appropriate colorectal cancer screening and preference for receiving screening advice among people attending outpatient clinics. *Australian & New Zealand Journal of Public Health, 42*(4), 334-339. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1111/1753-6405.12776

Halm, E., Beaber, E., McLerran, D., Chubak, J., Corley, D., Rutter, C., …Balasubramanian, B. A. (2016). Association between primary care visits and colorectal cancer screening outcomes in the era of population health outreach. *JGIM: Journal of General Internal Medicine, 31*(10), 1190-1197. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1007/s11606-016-3760-9

Helander, S., Heinavaara, S., Sarkeala, T., & Malila, N. (2018), Lifestyle in population-based colorectal cancer screening over 2-year follow up. *European Journal of Public Health, 28*(2), 333-338. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1093/eurpub/ckx139

Jones, C. L., Jensen, J. D., Scherr, C. L., Brown, N. R., Christy, K., & Weaver, J. (2015). The health belief model as an explanatory framework in communication research: Exploring parallel, serial, and moderated mediation. *Health Communication*, *30*(6), 566–576. Retrieved from http://doi.org/10.1080/10410236.2013.873363

Kirkoen, B., Berstad, P., Botteri, E., Dalen, E., Nilsen, J. A., Hoff, G., …Bernklev, T. (2017). Acceptability of two colorectal cancer screening tests: Pain as a key determinant in sigmoidoscopy. *Endoscopy, 49*(11), 1075-1086. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1055/s-0043-117400

Lairson, D. R., Kim, J., Byrd, T., Salaiz, R., & Shokar, N. K. (2018). Cost-effectiveness of community interventions for colorectal cancer screening: Low-income Hispanic population. *Health Promotion Practice, 19*(6), 863-872. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1177/1524839917750815

Lich, K. H., Cornejo, D. A., Mayorga, M. E., Pignone, M., Tangka, F. K. L., Richardson, L. C., …Kuo, T. M. (2017). Cost-effectiveness analysis of four stimulated colorectal cancer screening interventions, North Carolina. *Preventing Chronic Disease, 14*, 1-11. Retrieved from http://dx.doi.org/10.5888/pcd14.160158

Mojica, C. M., Parra-Medina, D., & Vernon, S. (2018). Interventions promoting colorectal cancer screening among Latino men: A systematic review. *Preventing Chronic Disease, 15*, 1-7. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.5888/pcd15.170218

Muliira, J. K., D'Souza, M. S., Ahmed, S. M., Al-Dhahli, S. N., & Al-Jahwari, F. R. M. (2016). Barriers to colorectal cancer screening in primary care settings: Attitudes and knowledge of nurses and physicians. *Asia-Pacific Journal of Oncology Nursing*, *3*(1), 98–107. Retrieved from http://doi.org/10.4103/2347-5625.177391

Saraste, D., Blom, J., Ohman, D. J., Syentelius, M., Elfstrom, K. M., & Tornberg, S. (2018). Initial participation as a predictor for continuous participation in population-based colorectal cancer screening. *Journal of Medical Screening, 25*(3), 126-133. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1177/0969141317717757

Sava, M. G., Dolan, J. G., May, J. H., & Vargas, L. G. (2018). A personalized approach of patient-health care provider communication regarding colorectal cancer screening options. *Medical Decision Making, 38*(5), 601-613. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1177/0272989X18763802

Slyne, T. C., Gautam, R., & King, V. (2017). Colorectal cancer screening: An educational intervention for nurse practitioners to increase screening awareness and participation. *Clinical Journal of Oncology Nursing, 21*(5), 543-546. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1188/17.CJON.543-546

Smith, S., Alema-Mensah, E., Yoo, W., Ansa, B., & Blumenthal, D. (2017). Persons who failed to obtain colorectal cancer screening despite participation in an evidence-based intervention. *Journal of Community Health, 42*(1), 30-34. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1007/s10900-016-0221-7

Troyer, L., Williamson, L. L., Merchant, L., & Lengerich, E. J. (2014). Using client reminders to increase colorectal cancer screening in Montana, 2012. *Preventing Chronic Disease, 11*, E51. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.5888/pcd11.130274

Weinberg, D. S., Keenan, E., Ruth, K., Devarajan, K., Rodoletz, M., & Bieber, E. J. (2013). A randomized comparison of print and web communication on colorectal cancer screening. *JAMA Internal Medicine, 173*(2), 122-129. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1001/2013.jamainternmed.1017

Wheeler, S. B., Leeman, J., Lich, K. H., Tangka, F. K. L., Davis, M. M., Richardson, L. C., & Hassmiller, L. K. (2018). Data-powered participatory decision making: Leveraging systems thinking and simulation to guide selection and implementation of evidence-based colorectal cancer screening interventions. *Cancer Journal, 24*(3), 132/139. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1097/PPO.0000000000000317

Woudstra, A. J., Timmermans, D. R., Uiters, E., Dekker, E., Smets, E. M., & Fransen, M. P. (2018). Health literacy skills for informed decision making in colorectal cancer screening: Perceptions of screening invitees and experts. *Health Expectations, 21*(3), 636-646. Retrieved from http://dx.doi.org.ezproxy.bradley.edu/10.1111/hex.12658

Appendix A

Colorectal Cancer Screening Best Practice Quality Metrics

This metric calculates the percentage of patients aged 50 to 75 years who received appropriate colorectal cancer screening: a colonoscopy within the last 10 years; a Cologuard within the last three years; a fecal immunochemical test within the last year.

Clinic	Target	June 2019	July 2019	August 2019
Health Clinic A	74%	63%	65%	66%
Health Clinic B	74%	64%	64%	64%
Health Clinic C	74%	70%	68%	68%
Health Clinic D	74%	73%	73%	73%
Health Clinic E	74%	76%	76%	76%

Appendix B

SWOT Analysis

Strengths -Support from evidence-based literature -Ability to offer a variety of screening options -Administration motivation	**Weaknesses** -Lack of willingness to accept practice change -Patient resistance to invasive procedures
Opportunities -Improved best practice quality metrics -Greater patient understanding -Improved patient health outcomes -Improved patient satisfaction	**Threats** -Limited allotted time for health care providers to spend with patients -Need for health care professionals to undergo educational training

Appendix C

INFORMED CONSENT FOR EXEMPT STUDIES WITH MINIMUM RISK

Department: Bradley University Graduate School, Department of Nursing
Study Title: Improving Colorectal Cancer Screening Rates in the Primary Care Setting
Student Principle Investigator (SPI): Kellie Frissora, BSN, RN

You are invited to participate in a quality improvement project. The purpose of this study is to determine whether changing the working behavior of the health care professionals of the five primary care facilities, through holding in-service training and implementing education, will improve colorectal cancer screening rates. The clinics involved include: Health Clinic A, Health Clinic B, Health Clinic C, Health Clinic D, and Health Clinic E. This study consists of participating in mandatory in-service training and implementing the behavior change. Your participation in this study during the in-service training will take approximately 30 minutes and implementation of behavior change will be over a two-month time period, September 2019 and October 2019. There is no link between your name and the study records. The outcome of this study will not have any impact on your employment. The outcome of the screenings will not be traced to you individually. The outcome of the screenings will be monitored. Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time.

A small inducement will be offered to the office that has ordered the most colorectal cancer screenings overall by the end of the two-month period. Any inducement offered will be of low monetary or intrinsic value, so as not to influence the project outcome.

Questions about this study may be directed to the student principle investigator in charge of this study:
Kellie Frissora, BSN, RN at klodge@mail.bradley.edu or (508) 740-8437. If you have general questions about being a study participant, you may contact the Committee on the Use of Human Subjects office at (309) 677-3877.

You are voluntarily deciding to participate in this study. Your submission of this consent form means that you have read and understand the information presented and have decided to participate. Your participation also means that all your questions have been answered to your satisfaction. If you think of any additional questions, you should contact the student principle investigator.

Statement of Consent: I have read the above information and have received answers to any questions I asked. I consent to take part in the study.

Participants Signature: _____ Date: _____

Participants Name (Printed): _____

This consent form will be kept by the student principle investigator for at least three years beyond the end of the study.

Appendix D

Friday, April 14, 2019

To Whom This May concern,

This letter is in regards to the DNP scholarly project for Kellie Frissora. Kellie has approached the leadership team at the and the centralized office of the Center for Research and Grants for her DNP project.

Kellie has been approved for her DNP project. Currently, the Site Authorization Letter is being reviewed and processed by Legal.

Kellie is also working directly with the Center for Research and Grants to determine if a local IRB application is necessary.

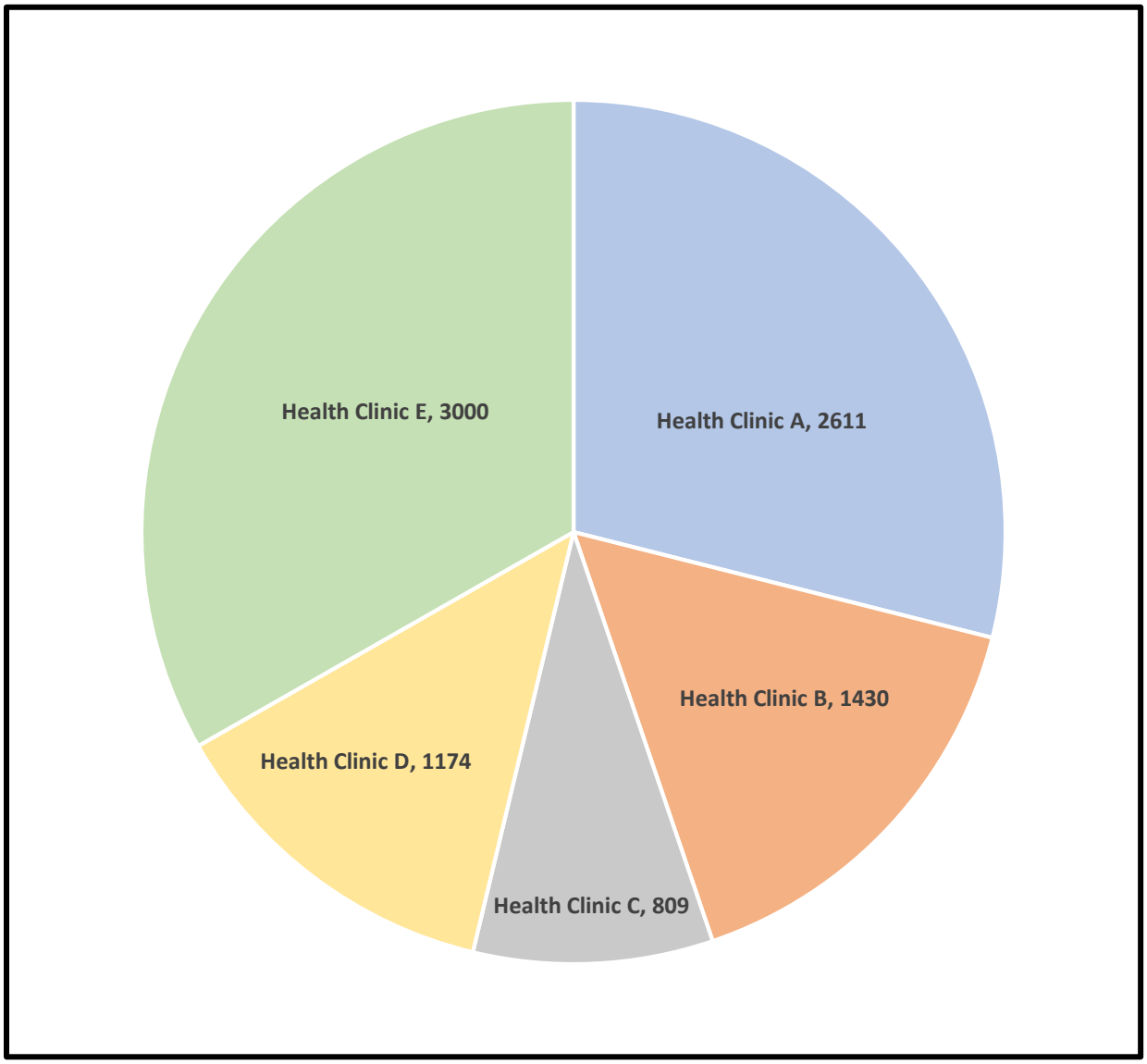
Please accept this letter as approval for Kellie's DNP project. As soon as the Site Authorization Letter is executed, a copy will be given to Kellie.

Please feel free to contact me directly if you have any further questions or concerns. I can be reached directly at

Hollie Wooten

Appendix E

Patient Panel Size of Quality Metric by Office in September 2019



Appendix F

PCP Cologuard Procedure

Ordering & Performing COLOGUARD Test

- PCP discusses need for colonoscopy with patient and determines (based on patient input) that patient is a candidate for Cologuard
  - Cologuard requires necessary exams and documentation
    - A documented rectal exam performed and documented in chart for the consult visit
    - A conversation and documented history of hemorrhoids
  - If the patient has a family history of colon cancer - Cologuard is not indicated/appropriate treatment for the patient
- ICD-10 Codes:
  - Z12.11 (Encounter for screening for malignant neoplasm of colon)
  - Z12.12 (encounter for screening for malignant neoplasm of rectum)
  - w/ R19.5 (Fecal Abnormal)
  - w/ G0121 (If Medicare)
- CPT Code:
  - 81528
- PCP/Nurse orders test in EHR
  - Cologuard Colorectal Cancer Screening (Fax Req to 844-870-8875) EXT900045

- Nurse provides patient with letter and instructions regarding Cologuard test:
  - Colonoscopy most effective
  - Negative Cologuard still has to be repeated every 3 years
  - Positive Cologuard requires referral for a diagnostic colonoscopy (The Cologuard test took the place of their screening colonoscopy)
- PCP/Nurse fills out order form for test and faxes to 844-870-8875
  - Test will be sent directly to patient with instructions
  - Patient returns test to company per instructions
  - Company faxes results to physician

exact sciences LABORATORIES

COLOGUARD® ORDER REQUISITION FORM

EXACT SCIENCES LABORATORIES
145 E. Badger Rd, Ste 100, Madison, WI 5
P: 844-870-8879 ; www.exactlab
Fax completed form to 844-870-

Provider & Order Information

Recommended: type all Provider information. Editable, printable PDF available at exactlabs.com

PROVIDER INFORMATION

Healthcare Organization: _____

Provider Name: _____

NPI #: _____
(or BIA # if NPI is not available)

Location Address: _____

City, State, Zip: _____

Phone Number: _____

Secure Fax Number*: _____
*To receive results for this order, please provide secure FAX number only

TEST INFORMATION

Test Name: Cologuard

Test Description: Stool-based DNA test with hemoglobin immunoassay component

ICD-10 Code:

☐ Z12.11 and Z12.12 (Encounter for screening for malignant neoplasm of colon [Z12.11] and rectum [Z12.12])

☐ Other(s) _____

We will not ship a collection kit to the patient if ICD-10 coding is missing. The above code is listed as a convenience. Ordering practitioners should report the diagnosis code(s) that best describes the reason for performing the test, regardless of whether the code is listed above or not.

Certification

I am a licensed medical professional authorized to order Cologuard. This test is medically necessary and the patient is eligible to use Cologuard. I will maintain the privacy of test results and related information as required by HIPAA. I authorize Exact Sciences Laboratories to obtain reimbursement for Cologuard and to directly contact and collect a second sample from the patient as appropriat

Ordering Provider Signature **Date of Ord**

PATIENT AUTHORIZATIONS, ASSIGNMENT OF BENEFITS (AOB) & FINANCIAL RESPONSIBILITIES

I authorize Exact Sciences Laboratories (Exact) to bill my insurance/health plan & furnish them with my Cologuard order information, test results, or other information requested for reimbursement. I assign all rights & benefits under my insurance plans to Exact & authorize Exact to appeal & contest any reimbursement denial, including in any administrative or civil proceedings necessary to pursue reimbursement. I authorize all reimbursements to be paid directly to the laboratory in consideration for services performed. I understand that I am responsible for any amount not paid, including amounts for non-covered services or services determined by my plan to be provided by an out-of-network provider.

Patient Signature: _____ **Date:** _____

Patient Information

Attach a copy of the front & back of primary and/or secondary insurance cards.

PATIENT INFORMATION: *Recommended – also attach a patient demographic sheet*

Patient ID/MRN: _____

First Name: _____ Last Name: _____

DOB* (mm/dd/yyyy): __/__/____ Sex: ☐ Male ☐ Female
*Medicare/Med Advantage coverage for patients between ages 50-85

Phone Number *(required)*: _____
☐ Home ☐ Mobile ☐ Work

Email address: _____

Language Preference *(optional)*: _____

PATIENT ADDRESS

Shipping Address: _____

City, State, Zip: _____

Billing Address: _____
☐ Same as Shipping

City, State, Zip: _____

Patient Insurance/Billing Information

Only completion of "Policyholder Name" and "Policyholder DOB" is necessary when attaching a copy of the front & back of primary and/or secondary insurance cards.

Policyholder Name: _____ **Policyholder DOB:** __/__/__ **Relationship to patient:** ☐ Self ☐ Spouse ☐ Other

Type: ☐ Insurance ☐ Medicare ☐ Medicare Advantage ☐ Medicaid ☐ Tricare ☐ Self-Pay

Insurance Carrier/Program: _____ **Customer Service # on Insurance Card:** (___)_____

Claims Submission Address: _____

Subscriber ID/Policy Number: _____ **Group Number:** _____ **Plan:** _____

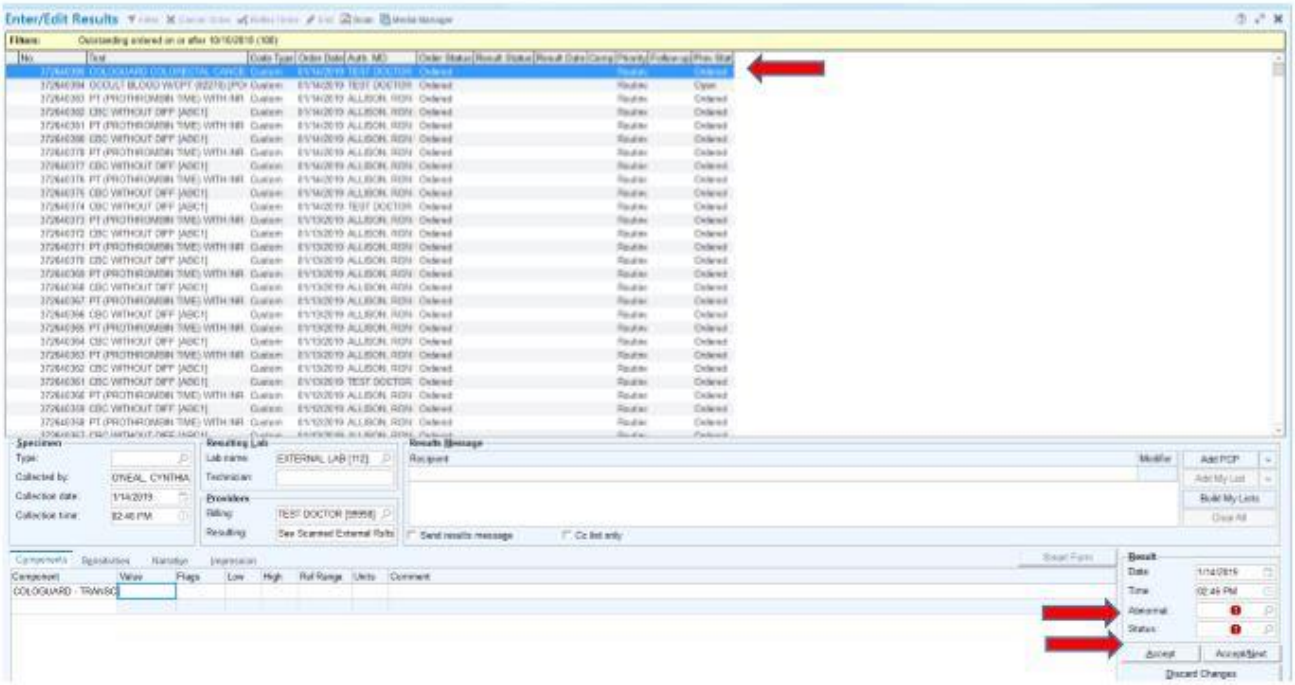
Fax completed form to 844-870-8875

For Laboratory Use Only
Sample Collected: __/__/____

1-G

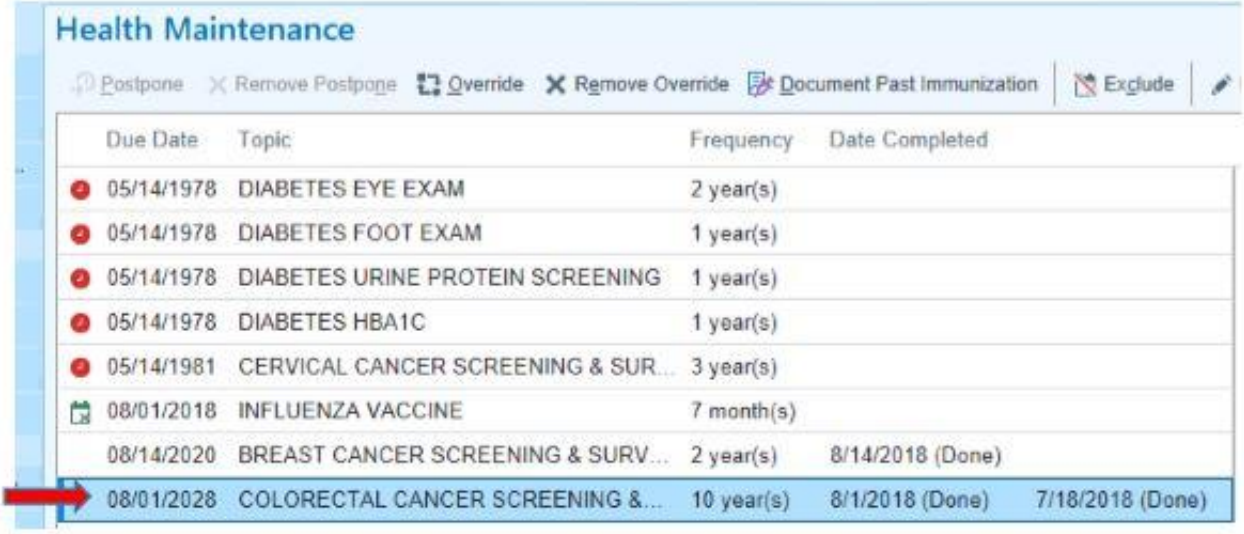
Enter / Edit Results

- Click Cologuard Order
- Enter Technician
- Results
  - Abnormal vs. Normal
- Status
  - Final / In Process / Preliminary Result
- Accept

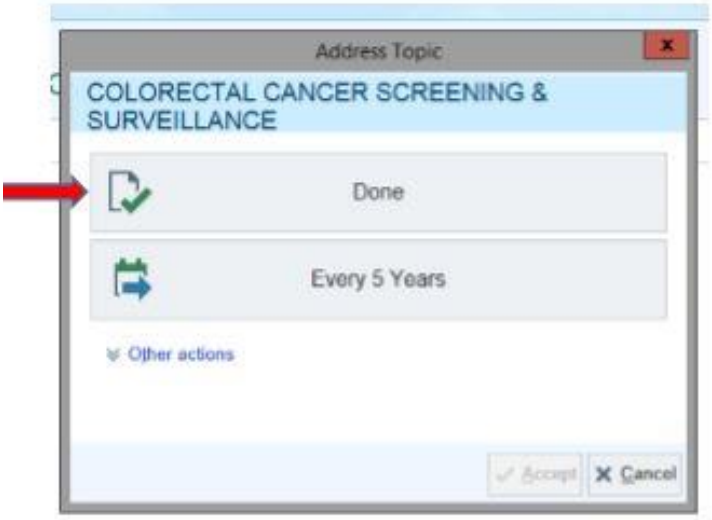


Update Health Maintenance

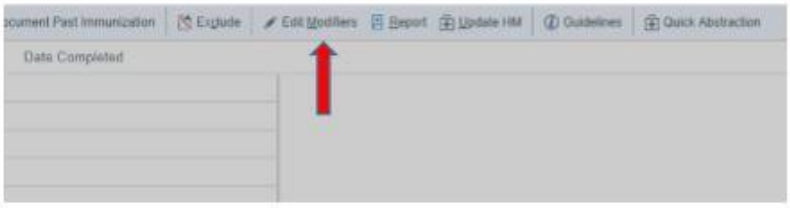
- Click on Colorectal Cancer Screening



- Click: DONE
- Add: COMPLETION DATE
- Click: ACCEPT



- Click on: EDIT MODIFIERS
- Choose: COLORECTAL CANCER SCREENING 3Y Cologuard
- Click: ACCEPT



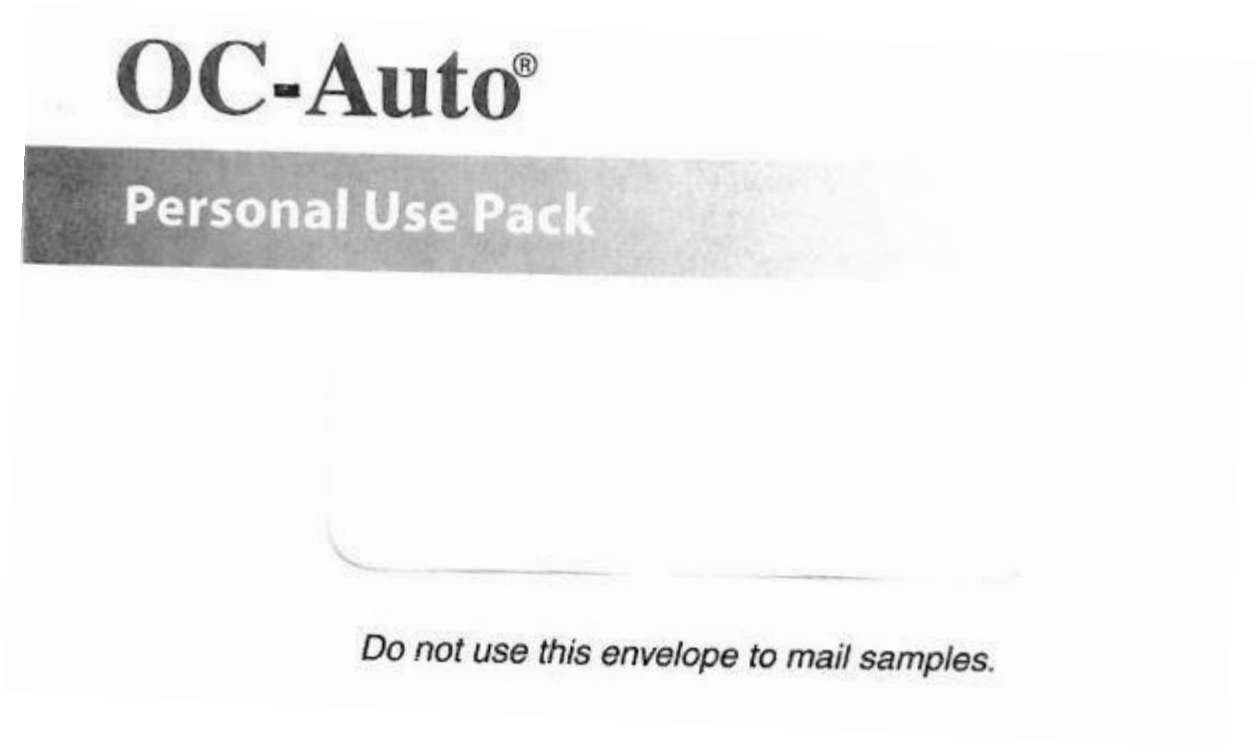
Appendix G

PCP FIT Procedure

Ordering & Performing FIT Test

- PCP discusses need for colonoscopy with patient and determines (based on patient input) that patient is a candidate for FIT
- ICD-10 Codes:
    - Z12.11 (Screening Colonoscopy)
    - w/ R19.5 (Fecal Abnormal)
    - w/ G0121 (If Medicare)
- CPT Codes:
    - 82274
    - G0328 (If Medicare)
- PCP/Nurse orders test in EHR
    - Occult Blood, Screening – FIT (82274/G0328QW) POC940000
- Nurse provides patient with letter and supplies regarding FIT:
    - Provides and explains each point in letter
        - Colonoscopy most effective
        - Negative FIT still has to be repeated annually
        - Negative FIT can miss some polyps/cancers
        - Positive FIT indicates blood in stool and possible polyp/cancer
        - Positive FIT requires follow-up colonoscopy
        - Need to check with insurance regarding coverage of colonoscopy as screening or diagnostic

Outside of the Package:



HH

40148-LBCP-BNC-02

DID YOU REMEMBER TO INSERT YOUR TEST REQUISITION OR DOCTOR'S SCRIPT?

Sample Packaging Instructions:

1. Collect stool per sample collection instructions.
2. Label sampling bottle with name, date of birth, and collection date.
3. Remove plastic bag and absorbent pad from envelope.
4. Wrap sampling bottle in absorbent pad and insert into plastic bag.
5. Insert plastic bag containing sampling bottle and absorbent pad into mailing envelope.
6. Record stool collection date on the test requisition and insert into mailing envelope. Test cannot be performed without this.
7. Peel tape from flap.
8. Fold flap at prefold line.
9. Press firmly to seal.
10. Promptly (within 24 hours for collection), place the mailing envelope in the US Mail for delivery directly to the laboratory

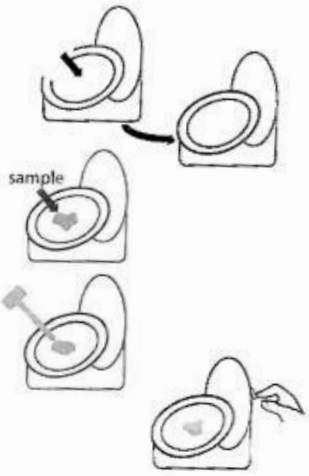
Lot No.: K0518

Package Insert for Personal Use Kit

Read all package insert directions carefully before sample collection.
Test results may be invalid if test is not performed properly.

Sample Deposit

1. Place supplied collection paper inside toilet bowl on top of water.
2. Deposit stool sample on top of collection paper.
3. Collect sample from stool before paper sinks and stool sample touches water.
4. Flush. Collection paper is biodegradable and will not harm septic systems.



Sample Collection

1. Label sampling bottle with name, date of birth, and collection date.

Open green cap by twisting and lifting.

2. Scrape the surface of the fecal sample with the sample probe.

Cover the grooved portion of the sample probe completely with stool sample.

3. Close sampling bottle by inserting the sample probe and snap green cap on tightly. Do not reopen.

Promptly (within 24 hours of collection), return the sample bottle, with the test requisition or physician's prescription, to the laboratory by US Mail.

Patient Instructions for Collecting **Stool Specimens**

For Immunochemical Fecal Occult Blood Testing (iFOBT)

For accurate results: Read all package insert directions carefully before sample collection.
Test results may be invalid if sample is not collected properly.

Sample Deposit

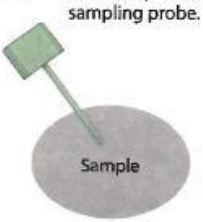
1. Place supplied collection paper inside toilet bowl on top of water.
2. Deposit stool sample on top of collection paper.
3. Collect sample from stool before paper sinks and stool sample touches water.
4. Flush. Collection paper is biodegradable and will not harm septic systems.

Sample Collection

1 **A.** Label sampling bottle with name, date of birth, and collection date.

B. Open green cap by twisting and lifting.

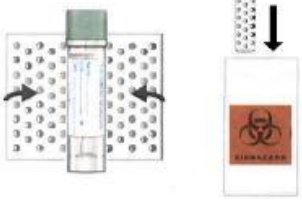
2 **A.** Scrape the surface of fecal sample with the sampling probe.



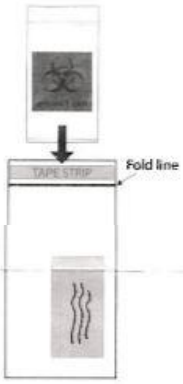
B. Cover the grooved portion of the sampling probe completely with stool sample.

3 **A.** Close sampling bottle by inserting the sampling probe, and snap green cap on tightly. Do not reopen.

B. Wrap sampling bottle in absorbent pad and insert into plastic bag.



4 **A.** Insert plastic bag with sample bottle and absorbent pad, **together with the test requisition or physician's prescription**, into envelope.

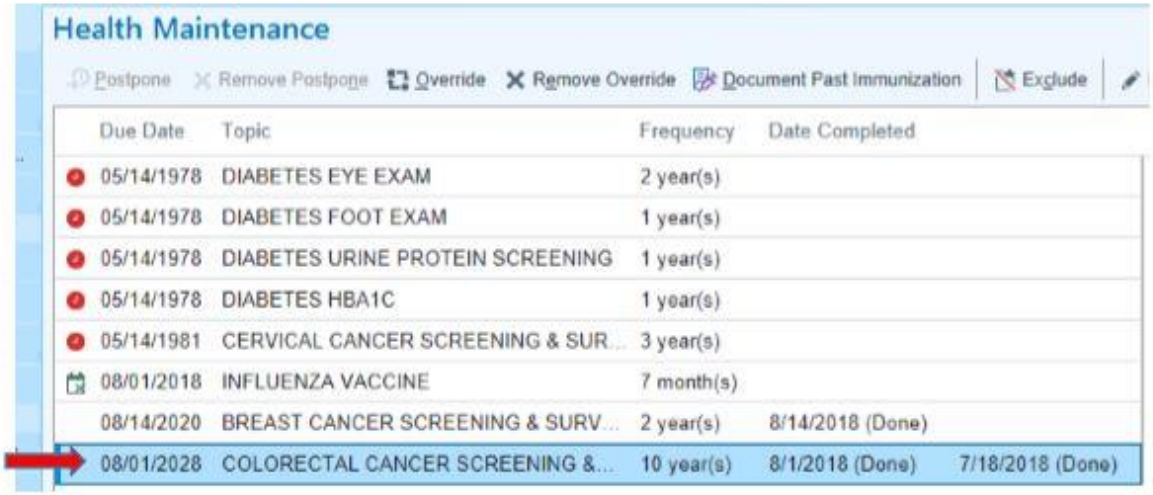


B. Peel tape from flap of envelope. Fold flap at line. Press flap firmly to seal. Promptly (within 24 hr of collection) return envelope to your doctor or place in the US Mail for direct delivery to the laboratory.

LabCorp

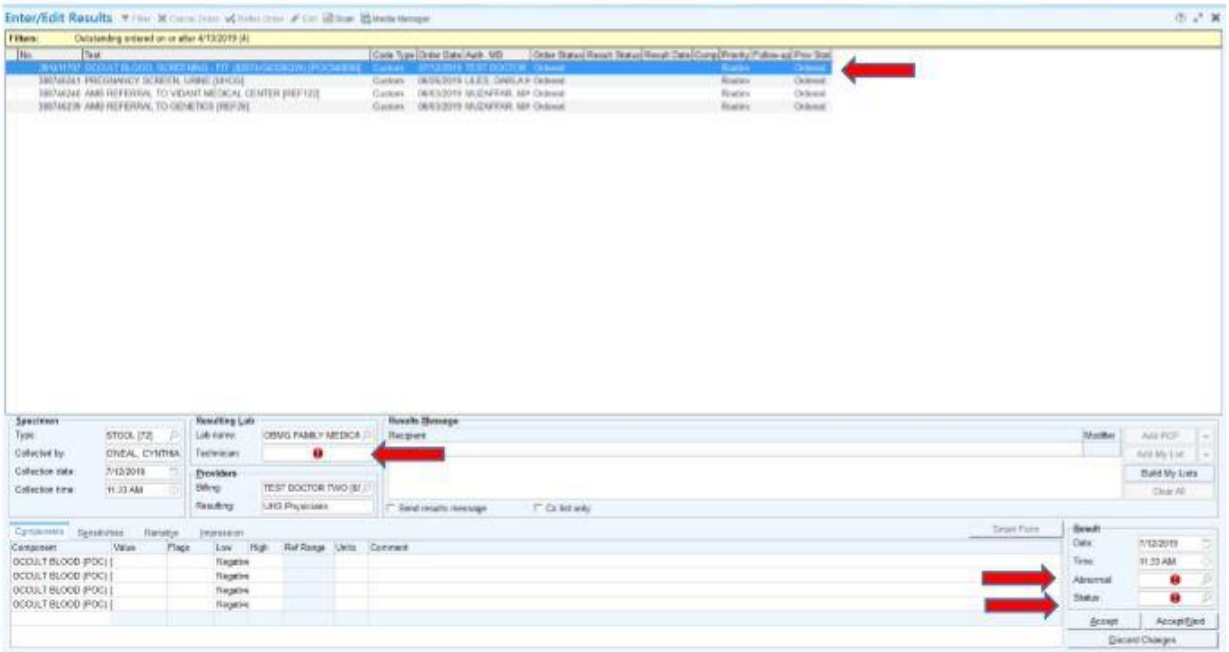
Update Health Maintenance

- Click on Colorectal Cancer Screening

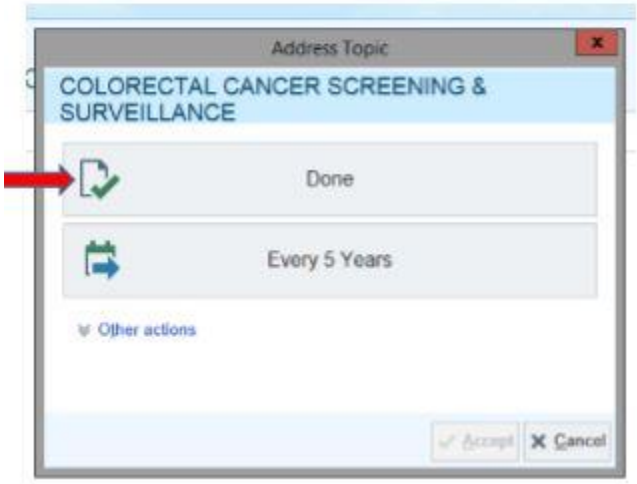


Enter/Edit Results

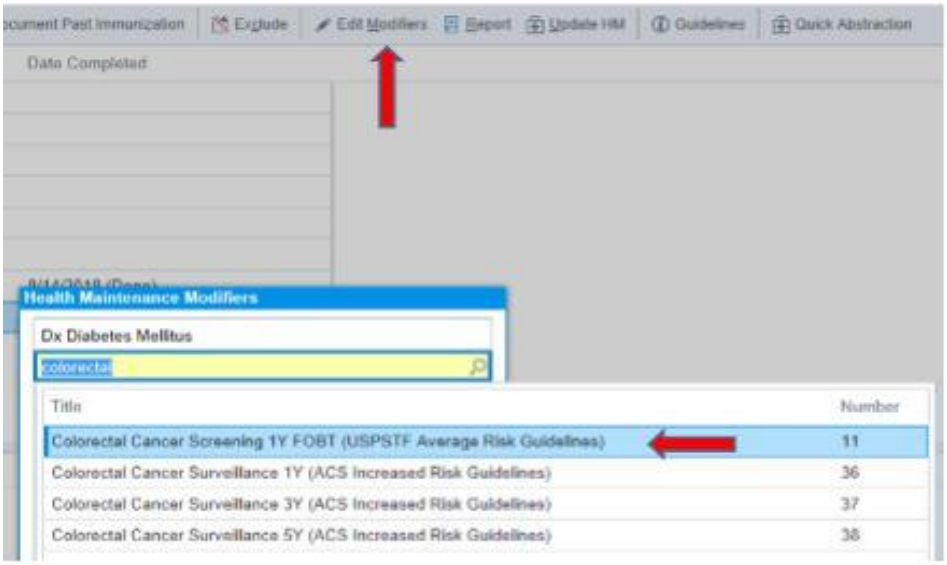
- Click Occult Blood Order
- Enter Technician
- Results
  - Abnormal vs. Normal
- Status
  - Final / In Process / Preliminary Result
- Accept



- Click: DONE
- Add: COMPLETION DATE
- Click: ACCEPT



- Click on: EDIT MODIFIERS
- Choose: COLORECTAL CANCER SCREENING 1Y FOBT
- Click: ACCEPT



Appendix H

I, [redacted], give the Doctor of Nursing Practice student, Kellie Frissora, permission to use the following documents titled, PCP Cologuard Procedures, PCP FIT Procedures, Cologuard Colorectal Screening Test, FIT Colorectal Screening Test, and Colonoscopy Colorectal Screening Test, in her scholarly practice project.

[redacted]

Appendix I

Cologuard Colorectal Screening Test

Dear Patient:

Because of your age, your provider has ordered a **Cologuard Test** to look for possible signs of colorectal cancer. While this test is a useful screening tool, we want to share some additional details so that you will be able to make the most informed decision with regard to your health.

1. A colonoscopy is considered to be the most effective tool to screen for colorectal cancer. We understand that you many choose to opt out of this procedure, so some form of screening (i.e. Cologuard) is certainly better than none.
2. It is usually recommended that normal or negative Cologuard test be repeated every three years. A normal coloscopy does not need to be repeated for five to ten years.
3. If a Cologuard test is normal or negative, it does not always mean that colorectal cancer or colon polyps are not present.
4. An abnormal or positive Cologuard result means that there was blood in your stool at the time of the test. A colon polyp, a pre-cancerous polyp, or cancer can cause a positive stool test. With a positive test, there is a chance that you could have colorectal cancer.
5. If your Cologuard is abnormal or positive, your provider will refer you to have a colonoscopy in order to further investigate the reason for having blood in your stool.
6. If the Cologuard test comes back positive, the colonoscopy **will be** considered a diagnostic procedure, rather than a screening procedure. The out-of-pocket cost to you may vary based on your individual policy.
7. We encourage checking with your insurance company prior to any colorectal cancer screening procedure.

We encourage you to verify your coverage with your insurance company.

I have read this information and consent to the Cologuard test.

_____ _____

Please print your full name. Date of Birth

_____ _____

Signature of Patient Date

Appendix J

FIT Colorectal Screening Test

Dear Patient:

Because of your age, your provider has ordered a **Fecal Immunochemical Test (FIT)** to look for possible signs of colorectal cancer. While this test is a useful screening tool, we want to share some additional details so that you will be able to make the most informed decision with regard to your health.

8. A colonoscopy is considered to be the most effective tool to screen for colorectal cancer. We understand that you many choose to opt out of this procedure, so some form of screening (i.e. FIT) is certainly better than none.
9. It is usually recommended that normal or negative FIT test be repeated annually. A normal coloscopy does not need to be repeated for five to ten years.
10. If a FIT test is normal or negative, it does not always mean that colorectal cancer or colon polyps are not present.
11. An abnormal or positive FIT result means that there was blood in your stool at the time of the test. A colon polyp, a pre-cancerous polyp, or cancer can cause a positive stool test. With a positive test, there is a chance that you could have colorectal cancer.
12. If your FIT is abnormal or positive, your provider will refer you to have a colonoscopy in order to further investigate the reason for having blood in your stool.
13. If your insurance covers your FIT test and it comes back positive, the colonoscopy will still be covered as a screening test. This can change to a diagnostic test, if there are findings during the colonoscopy.
14. We encourage checking with your insurance company prior to any colorectal cancer screening procedure.

We encourage you to verify your coverage with your insurance company.

I have read this information and consent to the Fecal Immunochemical Test (FIT).

_____ _____

Please print your full name. Date of Birth

_____ _____

Signature of Patient Date

Appendix K

Colonoscopy Colorectal Screening Test

Dear Patient:

Your provider has referred you for a **colonoscopy**. There are two general types of colonoscopies – a screening colonoscopy and a diagnostic colonoscopy. The purpose of this communication is to provide you with some useful information with regard to the definition of the two types and how insurance companies consider them.

- Patients referred for a **screening** colonoscopy generally meet these criteria:
  - No gastrointestinal symptoms
  - Age 50 to 75 years with no high-risk factors
  - Personal history of colon cancer or colon polyps
  - Family history (first degree relative) of colon cancer or colon polyps
- Patients referred for a **diagnostic** colonoscopy generally meet these criteria:
  - Blood in stool/hemopositive stool
  - Positive Cologuard test
  - Bleeding from rectum
  - Iron deficiency anemia of unknown cause, confirmed by laboratory findings
  - Change in bowel habits
- Insurance coverages for these two procedures often vary – screening colonoscopies are generally covered as a routine, preventive service while diagnostic colonoscopies often have a higher charge associated with them.

We encourage you to verify your coverage with your insurance company.

I have read this information and consent to the screening colonoscopy.

_____	_____
Please print your full name.	Date of Birth
_____	_____
Signature of Patient	Date

Appendix L

BRADLEY University

DATE:	23 May 2019
TO:	Kellie Frissora, Judith Walloch
FROM:	Bradley University Committee on the Use of Human Subjects in Research
STUDY TITLE:	Improving colorectal cancer screening rates in the primary care setting
CUHSR #:	# 23-19
SUBMISSION TYPE:	Initial Review
ACTION:	Approved
APPROVAL DATE:	23 May 2019
REVIEW TYPE:	Exempt

Thank you for the opportunity to review the above referenced proposal. The Bradley University Committee on the Use of Human Subject in Research has determined the proposal to be EXEMPT from IRB FULL REVIEW according to federal regulations

The study has been found to be exempt pursuant to 45 CFR 46.104(d) 3 [(i) Research involving benign behavioral interventions in conjunction with the collection of information from an adult subject through verbal or written responses (including data entry) or audiovisual recording if the subject prospectively agrees to the intervention and information collection and at least one of the following criteria is met:(A) The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects (B) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation]

Please submit a final status report when the study is completed. A form can be found on our website at https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/. Please retain research records for three years from the conclusion of your study. Be aware that some professional standards may require the retention of records for longer than three years. If this study is regulated by the HIPAA privacy rule, retain the research records for at least 6 years.

Be aware that any future changes to the protocol must first be approved by the Committee on the Use of Human Subjects in Research (CUHSR) prior to implementation and that substantial changes may result in the need for further review. These changes include the addition of study personnel. Please submit a Request for Minor Modification of a Current Protocol form found at the CUHSR website at https://www.bradley.edu/academic/cio/osp/studies/cuhsr/forms/ should a need for a change arise. A list of the types of modifications can be found on this form.

While no untoward effects are anticipated, should they arise, please report any untoward effects to CUHSR immediately.

This email will serve as your written notice that the study is approved unless a more formal letter is needed. You can request a formal letter from the CUHSR secretary in the Office of Sponsored Programs.