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Assessment of Patient Barriers to and Facilitators of Screening Colonoscopy: Utilizing Patient Perspectives to Formulate Recommendations to Improve Colorectal Cancer Screening Rates

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DNP Practice Inquiry Project Report

Assessment of Patient Barriers to and Facilitators of Screening Colonoscopy: Utilizing patient perspectives to formulate recommendations to improve colorectal cancer screening rates.

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Spring 2015

Lynne A. Jensen, PhD, APRN, BC – Committee Chair

Nora Warshawsky, PhD, RN – Committee Member

John Shekleton, M.D. – Committee Member, Clinical Mentor

Dedication

"Some people weave burlap into the fabric of our lives, and some weave gold thread. Both contribute to make the whole picture beautiful and unique."

~ Anonymous

This capstone project is dedicated to those who made the completion of my educational journey possible. To my husband, Thadis Cox, your strength and perseverance has carried me through the toughest of times and I thank you for your love and encouragement. To my sweet daughter, Ava, you are my heart and you have given my life a new purpose and source of strength. To my parents, Phillip and Susan Barker, you have made me the person I am today and it is through your unfailing love and support that I have been able to reach for and achieve my dreams. To my academic advisor, Lynne Jensen - Time is such a precious gift in this life, and the fact you were willing to devote so much of it to ensure my success in this program leaves me speechless. I am truly thankful. To my fellow co-workers at Frankfort Regional Medical Center, without your willingness to cover in my absence and without your continued love and support, this would not have been possible. To my dear friend, Somer Robinson, you've been an incredible source of encouragement over the years and I thank you.

***

For all of you are golden threads in the fabric of my life.

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DNP Practice Inquiry Project Introduction

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Colorectal cancer (CRC) will be diagnosed in approximately one out of every twenty Americans (5%) at some point during their lifetime, ranking it the third most commonly diagnosed cancer among all cancer types (American Cancer Society [ACS], 2014; Centers for Disease Control and Prevention [CDC], 2014a). It is the second leading cause of cancer-related death and was projected to kill more than 50,000 people in the United States (U.S.) in 2014 (CDC, 2014a). The economic burden of treating CRC is high, as the costs of CRC-related care to the Medicare program was projected to increase to over $14 billion in 2020 from approximately $7.5 billion in 2000 (Yabroff, Mariotto, Feuer, & Brown, 2008). However, with proper screening, CRC-related incidence, mortality, and cost of treatment could be significantly reduced.

The American College of Gastroenterology (ACG) and the U.S. Preventative Services Task Force (USPSTF) agree that CRC screening should include the following: 1) home fecal occult blood test (FOBT) or fecal immunochemical test (FIT) yearly; 2) flexible sigmoidoscopy every five years, plus FOBT/FIT every three years; and/or 3) colonoscopy every 10 years (Rex et al., 2009; USPSTF, 2008). A systematic review of cost-effectiveness analyses revealed that the use CRC screening methods equates to an average cost-effectiveness ratio of $10,000 to $30,000 per life-year saved when compared to no screening (Pignone, Heorgem, & Mandelblatt, 2002). Colonoscopy remains the gold-standard screening exam for CRC because it allows for visualization of the colon as well as the identification and removal of pre-cancerous lesions (polyps).

During a screening colonoscopy, polyp removal can prevent the development of CRC by 80%, which is why evidence-based practice strategies have been adopted by many providers to increase recommendations and orders for CRC screening tests (U.S. Department of Health and Human Services [HHS], n.d.; Sarfaty, 2008). Despite the success of evidence-based strategies to increase recommendations and orders for screening colonoscopy, it was determined that among individuals who receive orders for screening colonoscopy, approximately 50% will fail to follow through with the procedure (Sequist, Zaslavsky, Marshall, Fletcher, & Ayanian, 2009). This practice inquiry project was developed to determine the barriers and facilitators of screening colonoscopy from the patient perspective and includes the following three manuscripts:

- Manuscript one is an investigation into the significance and impact of colorectal cancer, associated guidelines and practice tools for screening and management.
- Manuscript two is a review of literature to evaluate the existing interventions aimed at increasing provider compliance with CRC screening in primary care.
- Manuscript three describes the development and implementation of a qualitative study to determine patient-identified barriers and facilitators to screening colonoscopy, and its potential impact on future clinical practice and research.

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Colorectal Cancer: Significance and Impact, Associated Screening Tools, and Guidelines for Management

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Epidemiology and Impact

In the United States (U.S.), colorectal cancer (CRC) remains the third most common of all cancer types and is the second leading cause of cancer deaths (U.S. Cancer Statistics Working Group, 2013). In 2009, "136, 717 people in the United States were diagnosed with colorectal cancer, including 70, 223 men and 66, 494 women" (U.S. Cancer Statistics Working Group, 2013). Furthermore, colorectal cancer deaths totaled 51, 848, of which, 26, 806 were men and 25, 042 were women (U.S. Cancer Statistics Working Group, 2013). The per year age-adjusted death rate, calculated from the 2005-2009 U.S. data, was 16.7 per 100,000 men and women (National Cancer Institute [NCI], 2009). These numbers are projected to increase annually if screening efforts do not improve.

The National Cancer Institute's Surveillance and Epidemiology and End Results (SEER) report found that "from 2005-2009, the median age at diagnosis for cancer of the colon and rectum was 69 years of age" and the "median age at death was 74 years of age" (NCI, 2009, p. 1). Although CRC has been diagnosed in children and young adults, its occurrence is rare. Therefore, the population upon which screening efforts are primarily focused is middle-aged adults and the elderly ranging from ages 50 to 75 years. In the U.S., between 2005 and 2009, incidence rates among age specific groups were as follows: 0.1% were diagnosed under age 20; 1.1% between 20 and 34; 4.0% between 35 and 44; 13.4% between 45 and 54; 20.4% between 55 and 64; 24.0% between 65 and 74; 25.0% between 75 and 84; and 12.0% 85+ years of age" (NCI, 2009, p.1). Mortality rates per age group were: "0.0% died under age 20; 0.6% between 20 and 34; 2.5% between 35 and 44; 8.6% between 45 and 54; 16.5% between 55 and 64; 22.0% between

65 and 74; and 29.0% between 75 and 84; and 20.8% 85+ years of age" (NCI, 2009, p. 1).

Screening can assist with both the early diagnosis of CRC in its treatable stages, and with the detection of precancerous lesions (polyps) that, once removed, can prevent CRC development. The table below is from the NCI's SEER Stat Fact Sheet.

Table 1.

Stage Distribution and 5-year Relative Survival by Stage at Diagnosis for 2002-2008

Stage at Diagnosis	Stage Distribution (%)	5-year Relative Survival (%)
Localized (confined to primary site)	39	89.9
Regional (spread to regional lymph nodes)	36	69.9
Distant (cancer has metastasized)	20	11.9
Unknown (unstaged)	5	33.9

Note. Table figures depict percentages among males and females and all races (NCI, 2009, p. 1)

Regardless of the fact that colorectal cancer screening is a relatively safe and effective way to detect and even prevent the development of CRC cancer, "current levels of screening in this country lag behind those of other effective screening tests" (United States Preventative Services Task Force [USPSTF], 2008, p. 627). In the U.S. only 52.1% of eligible adults are being screened for colorectal cancer (U.S. Department of Health and Human Services [HHS], 2012). This disease is easily detectible and highly preventable when proper screening is implemented. The initiation of CRC screening typically occurs as a result of a primary care provider's (PCP) recommendation and they are usually the main source of specialist referral for the previously mentioned screening modalities (Ornstein, Nemeth, Jenkins, & Nietert, 2010). Sarfaty (2008) states,

"Practitioners must become aware that their recommendation is the single most influential factor in persuading individuals to be screened for cancer (p. 9).

Purpose Statement

A precipitous decrease in the number of newly diagnosed colorectal cancers would occur if adenomatous colorectal polyps were removed prior to their transformation into cancers. Based on clinical evidence, screening (to include both prevention and detection tests) is to begin at age 50 among those of average risk and earlier for individuals considered to be at high risk (Sarfaty, 2009). Multiple strategies have been attempted in primary care practices to increase provider compliance with cancer screening, and these strategies have been evaluated for effectiveness. However, multi-strategy interventions, as opposed to single-strategy interventions (i.e. Electronic Medical Record (EMR) or paper chart reminders), have proven to be most successful at increasing PCP screening rates (Baker et al., 2009; Ornstein et al., 2010). The following sections of this paper will review the Healthy People 2020 objectives regarding CRC screening, the current CRC screening guidelines, and an evidence-based strategy that can be used to manage the issue of CRC screening among PCPs.

Healthy People 2020

Healthy People.gov is a federally funded website that provides national health goals for the U.S. population. Multiple benchmarks have been created and continuous monitoring takes place in an effort to 1) "encourage collaborations across communities and sectors"; 2) "empower individuals toward making informed health decisions; and 3) "measure the impact of prevention activities" (U.S. Health and Human Services [HHS], 2012, p.1). Healthy People 2020 also created a set of objectives, known as the Leading

Health Indicators (LHI), to draw attention to higher priority health issues as well as the corresponding activities designed to address them.

To "increase the proportion of adults who receive a colorectal cancer screening based on the most recent guidelines in 2008" is a Leading Health Indicators of Healthy People 2020 (HHS, 2012). Baseline data reveals that among adults age 50 to 75 years, only 52.1% were appropriately screened for colorectal cancer based on the most current 2008 guidelines (HHS, 2012). The set target for CRC screening is to increase the screening rate from 52.1% to 70.5% by year 2020 (HHS, 2012).

CRC Screening Tools

The American College of Gastroenterology (ACG) is the primary source for the current screening guidelines that ultimately determine the age group(s) for CRC screening as well as the appropriate screening tools used to assess for the presence of cancers of the colon and rectum. Recommended guidelines were recently revised by the ACG and highlight the division of tests into cancer prevention and cancer detection tests. The recommendations include the following screening modalities: screening of average-risk adults aged 50-75 year by way of fecal immunochemical test (FIT), or high-sensitivity fecal occult blood test (FOBT) yearly, high-sensitivity FOBT every 3 years along with flexible sigmoidoscopy every 5 years, or colonoscopy every 10 years (Rex et al., 2009). Furthermore, special population considerations also include screening of African Americans at age 45 and screening of individuals with a positive family history (defined as a first-degree relative) 10 years prior to the age of the relative's CRC diagnosis (Rex et al., 2009). Below a full description of the ACG screening recommendations is presented in an easy to read, bulleted listed that also includes the

category and strength of recommendation (See Appendix A for the Category of Evidence and Strength of Recommendation Chart) (Rex et al., 2009, p. 2):

CRC Screening Recommendations

Preferred CRC Screening Recommendations

- Cancer prevention tests should be offered first. The preferred CRC prevention test is colonoscopy every 10 years, beginning at age 50 (Grade 1 B). Screening should begin at age 45 years in African Americans (Grade 2 C).
- Cancer detection test. This test should be offered to patients who decline colonoscopy or another cancer prevention test. The preferred cancer detection test is annual FIT for blood (Grade 1 B).

Alternative CRC Prevention Tests

- Flexible sigmoidoscopy every 5–10 years (Grade 2 B)
- Computed tomography (CT) colonography every 5 years (Grade 1 C)

  Alternative Cancer Detection Tests
- Annual Hemoccult Sensa (Grade 1 B)
- Fecal deoxyribonucleic acid (DNA) testing every 3 years (Grade 2 B)

Recommendations for Screening When Family History is Positive but Evaluation for Hereditary Non-polyposis Colorectal Cancer (HNPCC) Considered Not Indicated

- Single first-degree relative with CRC or advanced adenoma diagnosed at age ≥60 years

  Recommended screening: same as average risk (Grade 2 B)
- Single first-degree with CRC or advanced adenoma diagnosed at age <60 years or two first-degree relatives with CRC or advanced adenomas

Recommended screening: colonoscopy every 5 years beginning at age 40 years or 10 years younger than age at diagnosis of the youngest affected relative (Grade 2 B)

Clinical Practice Guideline for Management

To manage the issue of inadequate and improper CRC screening by PCPs, an evidence-based clinical practice guideline should be implemented in primary care offices. The National Colorectal Cancer Roundtable (an activity of The American Cancer Society and The Center for Disease Control and Prevention), in collaboration with Thomas Jefferson University Department of Family Medicine, published a document by Mona Sarfaty, M.D. entitled, "How to Increase Colorectal Cancer Screening Rates in Practice: A Primary Care Clinician's Evidence-Based Toolbox and Guide 2008." The four main goals of this published guide are as follows: 1) To inform PCPs and their office managers about ways they can help prevent CRC among patients through proper screening; 2) To inspire PCPs to utilize appropriate screening recommendations to reduce the morbidity and mortality of CRC and other cancers; 3) "To facilitate effort of office-based clinicians to reduce disparities by applying screening guidelines on a universal basis to the age-appropriate population"; and 4) To improve prevention strategies in primary care facilities by use of the guide's tools and approaches (Sarfaty, 2008, p. 13).

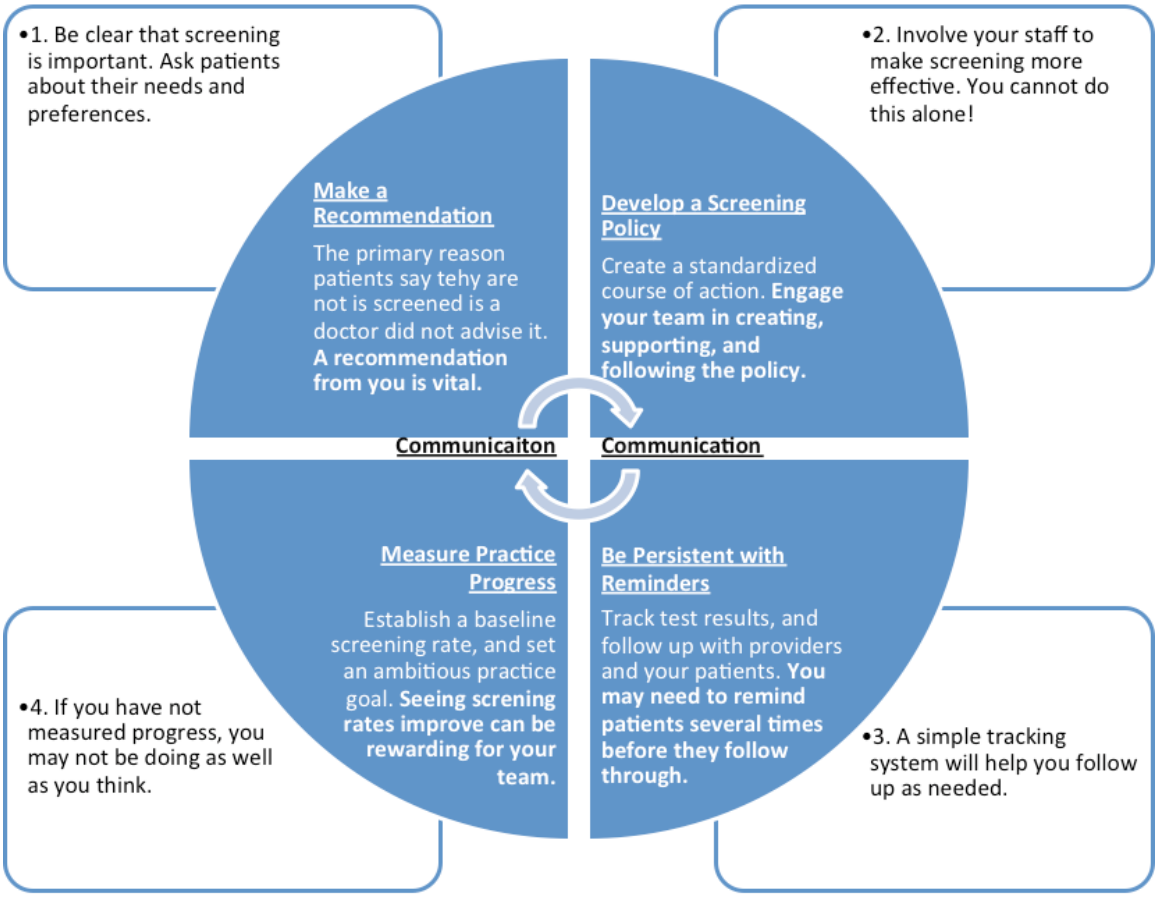
An accompanying action plan to the guide entitled, "How to Increase Preventative Screening Rates in Practice: An Action Plan for Implementing a Primary Care Clinician's Evidence-Based Toolbox and Guide" was developed by the National Colorectal Cancer Roundtable (NCCRT). It essentially breaks down and simplifies the 130-page guide to be used as a quick reference for PCPs. Within the action plan, there are four specific

recommendations: 1) “Implement practice changes to achieve the *Four Essentials*” (discussed below); 2) “Take steps to identify and screen every age-appropriate patient”; 3) “Involve your staff, and put office systems in place”; and 4) “Follow a continuous improvement model to develop and test changes” (NCCRT, 2008, p. 4).

Sarfaty (2008) recommends utilization of the Plan-Act-Study-Adjust (PASA) model. Practices must develop a plan that involves staff members in the creation of a system for CRC screening that is founded upon the *Four Essentials* and includes extraction of baseline screening rates. Staff members within the practice are then prompted to act upon the developed plan. The results of the plan are studied (i.e. screening rates) and then disseminated to staff members. Finally, the plan is adjusted and potential improvement opportunities are identified based on the results.

Figure 1.

Improve Cancer Screening Rates Using the Four Essentials



Note. From NCCRT (2008).

As mentioned above, the toolbox and guide uses a multi-strategy approach that highlights *Four Essentials* to improve CRC screening rates, and within each essential specific tasks are identified and practice tools/references are made available for use. *Essential #1* requires that providers make a CRC screening recommendation to every eligible and at-risk patient and determine a method to assess patient CRC risk as well as receptiveness to screening (Sarfaty, 2008). Practice tools made available within the guide include printable reference handouts to help providers: 1) understand CRC screening

options, 2) assess for patient CRC risk, and 3) assess patient readiness to be screened. *Essential #2* requires the development of a CRC screening policy that a) determines individual CRC risk level, b) identifies local medical resources, c) considers patient CRC screening preference, and e) attends to office implementation (Sarfaty, 2008). *Essential # 2* is a vital element as it "ensures consistency over time by clearly articulating the intentions of the practitioner and the practice" (Sarfaty, 2009, p. 19). Practice tools available for reference include: 1) sample CRC screening policies, 2) CRC screening algorithms and a FOBT flow chart; 2) an office policy worksheet that simplifies the policy into steps and delineates roles within the practice; and 3) a guide on how to develop a quality referral system in primary care. *Essential # 3* requires practices be persistent with patient and provider reminders. Patient reminders should include options for patient-appropriate educational materials and cues to action, while provider reminders should include elements such as chart prompts, EMR audits and feedback, EMR reminders, and screening log sheets (Sarfaty, 2008). Practice tools include 1) information from the ACP Center for Practice and Innovation and AAFP Center for Health IT on how to purchase an effective EMR system and 2) a printable sample chart prompt and sample CRC tracking log. *Essential # 4* requires measurement of progress within the practice and involves conducting regular meetings with staff members to "discuss how the system is working" and make any necessary adjustments (Sarfaty, 2009, p. 8). It is recommended that staff or a local consultant company be utilized to perform the audits. Practice tools include a printable practice performance handout that lists steps to a quality chart audit, and an Internal Practice Questionnaire that collects staff feedback to assess

goal attainment, usefulness of the CRC screening materials and documentation, and staff performance and satisfaction.

Conclusion

Colorectal cancer is the second leading cause of cancer death and remains the third most commonly diagnosed cancer (U.S. Cancer Statistics Working Group, 2013). Although CRC is easily detected and highly preventable through the use of prevention and detection tests (i.e. colonoscopy, CT colonography, flexible sigmoidoscopy, and FOBT/FIT), screening rates in the U.S. continue to be startlingly low at only 52.1% (HHS, 2012). With a CRC screening target set at 70.5% by Healthy People 2020 and 75% by the American Cancer Society, it is essential for PCPs to implement evidence-based strategies within their clinics in order to meet these goals and to decrease morbidity and mortality caused by this disease (HHS, 2012 and Sarfaty, 2009).

The National Colorectal Cancer Roundtable developed an action plan based on the document by Mona Sarfaty, M.D. entitled, "How to Increase Colorectal Cancer Screening Rates in Practice: A Primary Care Clinician's Evidence-Based Toolbox and Guide 2008" that gives PCPs step-by-step instructions and accompanying resources and tools to help their clinics reach and maintain the target screening goals (NNCRT, 2008 and Sarfaty, 2008). The NCCRT (2008) developed a flowchart that provides a complete pictorial depiction of the evidence-based guide (Figure 1).

Evidence-based management guidelines and toolkits have been developed to facilitate provider compliance with CRC screening recommendations. All that remains is for PCPs to implement them in practice and evaluate their effectiveness in achieving the goals set forth by Healthy People 2020.

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APPENDIX A
Category of Evidence and Strength of Recommendation

Methods Used to Analyze the Evidence: Review of Published Meta-Analyses and Systematic Review

Grade of Recommendation/Description	Benefit vs. Risk and Burdens	Methodological Quality of Supporting Evidence	Implications
1A/Strong recommendation, high-quality evidence	Benefits clearly outweigh risk and burdens, or vice versa	Randomized controlled trials (RCTs) without important limitations or overwhelming evidence from observational studies	Strong recommendation, can apply to most patients in most circumstances without reservation
1B/Strong recommendation, moderate quality evidence	Benefits clearly outweigh risk and burdens, or vice versa	RCTs with important limitations (inconsistent results, methodological flaws, indirect, or imprecise) or exceptionally strong evidence from observational studies	Strong recommendation, can apply to most patients in most circumstances without reservation
1C/Strong recommendation, low-quality or very low-quality evidence	Benefits clearly outweigh risk and burdens, or vice versa	Observational studies or case series	Strong recommendation but may change when higher quality evidence becomes available
2A/Weak recommendation, high-quality evidence	Benefits closely balanced with risks and burden	RCTs without important limitations or overwhelming evidence from	Weak recommendation, best action may differ depending on circumstances

Grade of Recommendation/Description	Benefit vs. Risk and Burdens	Methodological Quality of Supporting Evidence	Implications
		observational studies	or patients' or societal values
2B/Weak recommendation, moderate quality evidence	Benefits closely balanced with risks and burden	RCTs with important limitations (inconsistent results, methodological flaws, indirect, or imprecise) or exceptionally strong evidence from observational studies	Weak recommendation, best action may differ depending on circumstances or patients' or societal values
2C/Weak recommendation, low-quality or very low-quality evidence	Uncertainty in the estimates of benefits, risks, and burden; benefits, risk, and burden may be closely balanced	Observational studies or case series	Very weak recommendations; other alternatives may be equally reasonable

Note. Table from Rex et al., 2008, p. 2. Methods used**:** Review of Published Meta-Analyses and Systematic Review

Impact of Colorectal Cancer Screening Interventions among Primary Care Providers: An Integrative Review

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Abstract

Purpose: Multiple studies have been published to evaluate the effectiveness of interventions developed to increase colorectal cancer screening adherence in the primary care setting. An integrative review was conducted to determine which interventions were shown to be most successful at increasing CRC screening rates among primary care providers.

Methods: An integrative literature search was conducted among studies published between 2001 and 2011. The following online databases were used to conduct the literature search: (a) Cumulative Index to Nursing and Allied Health Literature (CINAHL); (b) MEDLINE (Ovid SP); and (c) PubMed (digitally produced file by the National Library of Medicine in the Biological sciences). The key words, phrases, and/or search terms used included: "colorectal screening," "cancer screening," "primary care and screening," "screening interventions," "cancer prevention," "colon cancer screening," "cancer screening and interventions," and "cancer prevention and primary care." Included were publications that (a) assessed the effects of interventions formulated to increased CRC screening compliance; (b) had screening-eligible adults as participants; (c) had a quantitative or qualitative design; (d) were written in English; and (e) were published between January 2001 and October 2011.

Results: Six articles met the inclusion criteria. Studies were separated into 2 specific groups for further evaluation and critical analysis – Multi-Strategy Intervention Studies and Combined Physician/Patient Reminder Intervention Studies.

Conclusions: Multi-strategy interventions are most successful at increasing CRC screening rates and include several key components (i.e. audit/feedback, education, physician and patient reminders, and expanded non-physician staff role). Patient and/or physician reminders do increase CRC screening rates but the increase is modest and should not be used as sole intervention but rather used in combination. Effective patient-provider communication is a key factor in determining CRC screening recommendation and exam completion, which reveals a provider education opportunity. Interventions that demonstrate an increase in screening colonoscopy orders resulted in a completion rate of only 50%. Patient perspectives regarding barriers to and facilitators of screening

colonoscopy completion could be valuable with regard to development of future combined patient- and provider- CRC screening interventions.

In the United States, colorectal cancer (CRC) remains the third most common of all cancer types and is the second leading cause of cancer deaths (U.S. Preventative Services Task Force [USPSTF], 2008). In 2008, it was estimated that 148,810 people would be diagnosed with CRC and 49,960 people would die as a result of this highly detectable and preventable disease (USPSTF, 2008). It was also projected that the achievement of proper screening goals could save approximately 18,800 lives annually (USPSTF, 2008). However, "current levels of screening in this country lag behind those of other effective screening tests" (USPSTF, 2008, p. 627). In 2008 only 56.3% of eligible adults 50 years and older reported having received CRC screening (U.S. Department of Health & Human Services [HHS], 2011).

Screening can assist with both the early diagnosis of CRC in its treatable stages, and with the detection of precancerous lesions (polyps) that, once removed, can prevent CRC development. Recommended guidelines were recently revised to include the following: screening of average-risk adults aged 50-75 years by way of fecal immunochemical test (FIT) or high-sensitivity fecal occult blood test (FOBT) yearly, FOBT/FIT every 3 years along with flexible sigmoidoscopy every 5 years, or colonoscopy every 10 years (Rex, et al., 2008; USPSTF, 2008). The initiation of CRC screening typically occurs as a result of primary care provider (PCP) recommendation and they are usually the primary source of referral for the screening modalities (Ornstein, Nemeth, Jenkins, & Nietert, 2010).

An integrative review was conducted to examine the impact of interventions that have been used to increase CRC screening compliance by primary care providers.

Findings could potentially guide the development of a multifaceted intervention that incorporates evidence-based findings from previous interventional studies to further increase CRC compliance.

Scope of the Review

An integrative review was conducted on the impact of interventions used to increase PCP screening compliance with CRC guidelines among eligible patients. The results of these interventions were summarized and analyzed to determine which intervention(s) had the greatest impact on improving CRC screening rates among PCPs. The goal of the review was to then determine whether a multifaceted intervention, using the best outcomes from previously studied evidence-based interventions, could be formulated to further increase compliance rates.

Design

The purpose of this review was to understand what interventions have increased CRC screening compliance among primary care providers. Included were publications that (a) assessed the effects of interventions developed to increased CRC screening compliance; (b) included screening-eligible adults as participants; (c) had a quantitative or qualitative design; (d) were written in English; and (d) were published between January 2001 and October 2011. References that (a) were not published works (i.e. theses and dissertations); (b) written in any language other than English; and (c) focused strictly on other cancer screenings (i.e. breast, prostate, cervical, etc.), cancer diagnosis, therapeutic and/or diagnostic interventions, or programs to only increase patient compliance were excluded.

Methods

The following online databases were used to conduct the literature search: (a) Cumulative Index to Nursing and Allied Health Literature (CINAHL); (b) MEDLINE (Ovid SP); and (c) PubMed (digitally produced file by the National Library of Medicine in the Biological sciences). The key words, phrases, and/or search terms used included: "colorectal screening," "cancer screening," "primary care and screening," "screening interventions," "cancer prevention," "colon cancer screening," "cancer screening and interventions," and "cancer prevention and primary care." The literature review served to investigate the impact of various interventions on colorectal screening compliance among primary care providers.

Each study was reviewed for content to ensure that the primary focus was colorectal screening compliance among primary care providers. The articles that met the inclusion criteria then underwent a more in depth and thorough review, to assure the study met the inclusion criteria. Critical analysis of the content reviewed the validity, reliability, and applicability of the study characteristics, findings, and results (O' Mathuna, Fineout-Overholt, & Johnston, 2011). Specifically, the sample and setting characteristics, procedures/methods for data collection, and strengths and weaknesses were evaluated.

Outcome

The interventional studies included in the review were clustered according to similarity, and included two specific intervention types: (1) multi-strategy intervention and (2) combined physician and patient reminder intervention. A table was constructed to present the summarized findings of the review (see Appendix A). Six studies were

retained for the review. Several references were excluded (n = 10) as the primary focus was on the investigation of patient-physician relationship dynamics, the exploration of attitudes/beliefs, and patient compliance. Also excluded, were the National Colorectal Cancer Roundtable Report and a narrative review.

Studies included in the review were either a randomized controlled trial (RCT) (n = 4) or had a quasi-experimental design (n = 2). Multidisciplinary teams comprised of medical doctors and/or researchers in science, nursing, or psychology conducted most of the studies. The studies that investigated multi-strategy interventions included one RCT (Ornstein et al., 2010) and one quasi-experimental study (Baker et al., 2009), while the studies that investigated a combined physician and patient interventions included three RCTs (Ayanian, Sequist, Zaslavsky, & Johannes, 2008; Ling et al., 2009; Sequist et al., 2009) and one quasi-experimental study (Geller et al., 2008).

Findings

Among the interventions that utilized the EMR for the purpose of baseline data and continuous performance audits, the EMR was found to be beneficial because it provided a method to evaluate and reinforce the quality improvement interventions being implemented (Baker, et al., 2009 & Ornstein et al., 2010). On the other hand, it was determined that incomplete CRC screening documentation within the EMR made it difficult to use during the auditing process, highlighting the need for and importance of effective systems (Ayanian et al., 2008). When solely utilized as a tool for provider reminders, EMRs did not produce a significant effect on CRC screening referrals or exam completion (Baker et al., 2009, Ornstein, et al., 2010, & Sequist et al., 2009). When patient reminders were also employed as a sole intervention (regardless of reminder

method) to increase CRC screening, they too, only produced a modest increase in screening referral and completion rates (Baker et al., 2009, Ornstein, et al., 2010, & Sequist et al., 2009). Rather, more benefit was found among studies that utilized patient and provider reminder methods in combination with other intervention strategies.

Conflicting findings were identified among studies that implemented provider education as an intervention to increase CRC screening referrals. When data analysis isolated the effects of provider education, Baker et al. (2009) determined that provider education alone yielded a limited effect, while Ornstein et al. (2010) found best-practice dissemination among providers to increase recommendation for and receipt of CRC screening. However, when patients received education regarding personalized need for CRC screening and providers received subsequent notification of patient CRC screening status, there was an increased promotion of 1) provider-patient discussion, provider recommendation, and positive patient intention to obtain screening (Geller et al., 2008). The importance of combined education strategies that involve both patients and providers is thereby emphasized.

Lastly, ineffective patient-provider counseling and communication has led to a decline in informed decision-making among patient concerning CRC screening (Ling et al., 2009 & Sequist et al., 2009). During observed patient visits, the biggest barrier to effective communication between providers and patients was found to be the overwhelming amount of competing demands that arise during the patient encounter (Ling et al., 2009). The importance of CRC screening is not being appropriately discussed and therefore, there is a deficiency in CRC screening referrals.

Multi-Strategy Intervention Studies

Ornstein et al. (2010). A randomized trial was conducted in 32 primary care practices over a two-year period to evaluate the impact of a three-phase quality improvement intervention on CRC screening. Phase one of the intervention provided PCPs in the intervention group with feedback from an EMR audit that evaluated CRC screening status of eligible patients. This information was then used to facilitate educational discussions during practice site visits (phase 2), which were specifically "designed to help practices implement an improvement model to adopt strategies to improve CRC screening" (p. 900). Phase three consisted of two annual meetings where physician and nurse liaisons from each practice shared its 'best-practice' approaches.

Overall, this study revealed that the utilization of a multi-strategy intervention within primary care practices using EMRs could improve their rates of CRC screening. There was a significant improvement (from 60.7% to 71.2%) in patients being up-to-date (UTD) with CRC screening in the intervention practices compared to patients in the control practices (from 57.7% to 62.8%). There was also a greater increase in provider recommendation of CRC screening within the intervention practices – an adjusted difference of 7.9% (95% confidence interval, 6.3% - 9.5%). There was also an increased use of FOBT in the intervention group suggesting that such a test could be a practical alternative for patients that did not receive an endoscopic form of screening and that its viability should be evaluated. Variability was also found in screening among practices during the study, where the best-performing practices screened 80% of eligible patients and worst performing practices only screened 50% or less. This finding suggests that best-practice adoption among practices have the potential to increase screening rates.

There were limitations in this study. Despite the fact intervention practices used EMR audits to ensure accurate data extraction, ascertainment bias may have caused information regarding CRC screening data to be incomplete. This bias may have occurred as a result of patients in the intervention practices being more consistently questioned about previous screening than those in the control practices. Furthermore, practices that were included used an EMR, had the advantage of research team involvement, and voluntarily enrolled in an improvement intervention making generalizability of the findings across primary care practices questionable. There was also no true control group due to the fact that "control group practices received an introductory site visit to discuss CRC screening and had the same EMR functionality as those in the intervention group" (p. 906). However, despite the limitations, this study used appropriate statistical analysis and methodical approaches demonstrate that practices following this type of multi-strategy intervention can improve their CRC screening rates.

Baker et al. (2009). A pilot-study was conducted in seven university-owned primary care practices that comprise the University of Utah Community Clinics and Utah Research Health Network, which cares for 100,000 patients. Included in the study, were patients aged 50 years or greater that were seen between January 1, 2003 thru October 31, 2006, and whose CRC screening was not UTD upon visit. Baker et al. (2009) implemented a three-phase intervention to test the effects of an expanded medical assistant (MA) role on CRC screening among eligible patients – the rate of screening colonoscopy orders being the key outcome measure.

A baseline EMR audit was performed for post-intervention comparative analysis. Phase one consisted of upgraded EMR "pop-up" reminders for PCPs with no immediate

effect on CRC screening rates. Phase-two provided CRC screening education to PCPs, which lead to an increase of 7.5% in CRC screening referral rates during the following month. The third-phase focused on the expansion of the MA role by 1) providing CRC screening education; 2) using scripts to initiate a CRC screening discussions with any eligible patients (per EMR "pop-up" reminder); and 3) using a manual CRC screening log to report the results of the CRC screening discussion; and 4) entering a preliminary CRC screening order (with patient permission), to be confirmed or rejected by the PCP. After this final phase was implemented, the mean monthly referral rate for colonoscopy increased from a baseline of 6.0% to 13.4% ($p<0.01$).

Although computerized reminders and PCP education alone were not effective, their use, combined with expanded non-physician roles, provided the most benefit. This was because non-physician staff members managed the flow of patient activity in the primary care offices. Investigators identified the need to evaluate "MA and physician response to the intervention and to identify the true rate of completed screening" (p. 358). The reasons being 1) only specific fields within the EMR were queried for actual results of colonoscopy; 2) progress and free text notes were not included, and 3) completion of other forms of acceptable screening modalities were not included. Therefore, the actual baseline colonoscopy referral or CRC screening rate may have been underestimated. Furthermore, the rapid progression through each intervention phase made it "impossible to isolate the effect of any one phase" (p. 358). Lastly, the fact that the participating clinics were university-owned and operated, and that a group within the university conducted the study, the ease at which the practices were able to implement these changes could be directly attributed to their rather advantageous circumstances (i.e. close

ties with the research network, unified EMR implementation, and unified management). This potentially limits the study's ability to generalize its findings and renders the need for future research to be conducted in more diverse practice settings.

Combined Physician / Patient Reminder Studies

Geller et al. (2008). Five primary care practices in rural communities implemented the use of a computerized tablet, or Patient/Provider Communication Assistant (PPCA), that was responsible for data collection, patient education, and personalization of printed patient and provider notes to encourage CRC screening discussions. A pre-/post- quasi-experimental design was used along with mixed model analyses during the intervention and comparison phases to assess the practices on "provider discussions about CRC screening, provider recommendation, and patient intention to be screened" (p. S36). The comparison group for this study was comprised of patients that expressed interest to participate in the study after their scheduled PCP office visit. A research assistant (RA) then obtained informed consent and conducted an exit interview consisting of questions that measured "demographics, risk factors, CRC screening history, interactions with the provider, and plans to be screened" (p. S40). As for the intervention group, eligible patients were engaged in a tablet-based, computerized educational program, using a Patient/Provider Communication Assistant (PPCA), upon arrival and prior to their scheduled primary care visit. After completing the interactive PPCA education, patients were given personalized CRC screening recommendations based on questions they answered during the program. A printed copy of the recommendations was given to the patient and an additional copy was placed in the patient's chart to be reviewed by the PCP.

Overall, the PPCA "promoted patient-provider discussion, provider recommendations, and positive patient intentions to obtain screening" (p. S40). Patients were also complimentary of the PPCA's ease of use. Strengths of the study included its recruitment processes as the intervention and comparison groups were selected from each of the five primary care practices. Generalizability is supported by the fact that the study results consistently "favored the intervention group across all 5 practices" (p. 41). Furthermore, the study's outcome variables did provide evidence "that the intervention stimulated higher levels of effective interaction between patient and provider, as intended, with significant effects on provider recommendations and patient intentions, two strong predictors of screening behavior" (p. S 40). The number of reported discussions regarding screening colonoscopy was twice as high as in the intervention groups compared to the control groups.

Limitations were noted with regard to study design. Despite the inclusion of a comparison group, there were no measures taken to randomly allocate study participants to conditions. Furthermore, there was systematic recruitment as opposed to random selection of the comparison group and its recruitment was done at an earlier time than that of the intervention group. The lack of random allocation of study participants and random selection of the comparison group opens the door for bias and make generalizability questionable. In addition, although important predictors of screening obtainment were apparent in the study outcomes, screening behaviors were not actually assessed. According to the investigators, participant charts were also only partially reviewed to determine whether screening actually occurred, due to insufficient resources. Lastly, it is also important to note that the practices had higher than normal patient

reported CRC screening rates, which indicates that such rates may be inaccurate due to the self-reporting aspects of the assessment.

Ayanian et al. (2008). A randomized controlled trial was utilized to determine if mailing patient-specific reminders to physicians would increase surveillance colonoscopy. An automated EMR review was conducted and 777 patients were identified as having had adenomatous colon polyps removed and having had no follow-up colonoscopy. The intervention group consisted of 358 patients whose physicians received a reminder letter notifying them that their patient was overdue for colorectal screening through surveillance colonoscopy. The patient received a copy of the letter that incorporated recommendations for colonoscopy and included instructions to contact their PCP for proper scheduling. A blinded medical record review was conducted at 6 months and assessed for completion of colonoscopy and for detection of adenomatous polyps and/or cancer. This particular study focused on slightly higher risk patients as opposed to most other studies that focused on patients of average risk. The study found that of those "358 patients whose physician received reminders, 33 (9.2%) patients underwent colonoscopy within 6 months compared with 16 (4.5%) of 359 patients whose physicians did not receive reminders (P=0.009) (p. 762).

Several limitations were noted to have potentially led to this marginal increase. There was no direct communication with patients "to recommend surveillance colonoscopy or to assess their reasons for not having this procedure" (p. 766). Furthermore and as previously mentioned, physician notes were not assessed originally to determine the completion of surveillance colonoscopy. This means that during a "post-hoc visual review of medical records" investigators found out that almost "25% of

patients had actually had a follow-up colonoscopy" before the intervention (p. 766). A survey of physicians, who had patients in the intervention group, also revealed that over "25% of patients were no longer active in the physicians' practices" (p. 766). For these patients there was a 5-year span during which they had not been seen by their former PCP, which gives insight into the difficulties that are presented with guaranteeing proper follow-up for patients requiring surveillance colonoscopy. This also highlights the need for "information systems that facilitate communication among gastroenterologist, primary physicians, and patients" (p. 766).

Ling et al. (2009). This paired randomized clinical trial sought to determine whether a "tailored versus nontailored physician recommendation letter and an enhanced versus nonenhanced physician office and patient management intervention" would have any effect on adherence with CRC screening (p. 47). Ten primary care practices were identified and yielded a sample of 599 patients that were CRC screen-eligible. The primary targets for this study included (1) "office and patient management procedures relating to the referral for endoscopic screening," and (2) "the written communication used to recommend endoscopic screening" (p. 53).

Although printed communications that are tailored, or personalized, tend to be well received and are more memorable than telephone reminders for patients, this study highlights that their effect is minimal in regard to changing a person's health behavior. This was partially attributed to the relatively small number of subjects allocated to each group (n = 150), meaning the study had "limited power to detect clinically meaningful effects from tailoring" – a common finding among similar studies (p. 53). The enhanced office visit and patient management strategies "increased the odds of completing a

colonoscopy or flexible sigmoidoscopy 1.63-fold (95% confidence interval, 1.11-2.41; *P* = .01)," while the "tailored letter increased the odds of completion by only 1.08-fold ((95% confidence interval, 0.72-1.62; *P* =.71)" (p.47). Study data also revealed the following colonoscopy rates: 1) 53.3% (81 of 152) for the tailored letter and enhanced management group; 2) 54.2% (103 of 190) for the nontailored letter and enhanced management group; 3) 43.6% (58 of 133) for the tailored letter and nonenhanced management group; 4) 37.9% (47 of 124) of the nontailored letter and nonenhanced management group.

A limitation was the "uncertainty regarding the rate of response (estimated 11.3%-13.9%) to mailed invitations to join the study" (p. 54). Furthermore, the low rate of participation leads to concerns that the recruitment of patients could have potentially chosen a group that was more accepting of endoscopic screening. Another issue with recruitment relates to the method by which patients were actually included. Participants were required to "(1) receive and open a mailing, (2) read and react favorably to its contents, and (3) sign and return an unfamiliar consent form" (p. 54). Therefore, the question arises, could face-to-face contacts in a clinical setting produce higher response rates? Additional research is needed to investigate this variance in recruitment method. Regardless of its limitations, this study demonstrates that "an enhanced office and patient management system significantly improved screening adherence" (p. 54).

Sequist et al., 2009. This study demonstrates that, among patients who are considered to be overdue for CRC screening, a modest increase in screening rates can be achieved through personalized mailings, especially among older patients and by way of FOBT. Screening rates were slightly higher among the patients that received reminders versus

those who did not (44.0% vs 38.1%; $P < .001$). This finding suggests, "patients represent an untapped resource for improving quality of care" (p. 368). Most patients deny ever having received effective counsel from their PCP regarding CRC screening and its importance; however, this study found that patients who are adequately informed about preventative services usually take on a more active role in preventative care. The group that received electronic physician reminders produced similar screening rates among patients when compared to the control group (41.9% vs 40.2%; $P = .47$).

Unfortunately, the study demonstrates that electronic physician reminders did not lead to a significant increase in CRC screening rates. This was attributed to the typically long time span between patient primary care visits, as most patients never saw their PCP during the study's 15-month observation period. However, for patients that saw their PCP 3 or more times per year, the electronic reminders did produce an increase in screening rates (59.5% vs 52.7%; $P = .07$), which was evidenced by an increased number of colonoscopy orders. However, this modest increase in orders "did not produce a corresponding increase in completed procedures, as nearly half of the patients" did not follow through with the procedure (p. 369). This highlights the need for PCP to engage in more effective communication with their patients and also highlights the need for research to investigate the reasons why patients do not follow through with screening.

Discussion

Study results demonstrate that physician and patient reminders, regardless of their source, can increase CRC screening rates. However, the increase is modest at best when patient and provider reminders are used separately or as an exclusive CRC screening intervention, which reiterates the need for reminders to target both the provider and

patient and be used in combination (Ayanian et al., 2008, Geller et al., 2008, Ling et al., 2009, & Sequist et al., 2009). The same was true with regard to patient and provider education because CRC screening referral rates and CRC screening exam rates were increased when CRC screening education targeted clinicians and patients (Geller et al.2008, Ling et al., 2009, & Ornstein et al., 2010). Ineffective patient-provider communication has led to low CRC screening referral rates among physicians and low CRC screening exam rates among patients, which reveals that improper patient-provider communication causes a low level of informed decision-making among CRC screening eligible patients (Baker et al., 2009 and Ling et al., 2008). Electronic medical records are useful, especially for auditing purposes, because it allows for provider feedback on quality improvement interventions and goal attainment. However, when the EMR is used to produce electronic provider reminders, their sole utilization as a means to increase CRC screening recommendations and referrals may not be as viable as once believed (Ayanian et al. 2008, Baker et al., Sequist et al., 2009). This reiterates the need for multi-strategy CRC screening programs that combine patient- and provider-targeted interventions.

A multi-strategy intervention that resulted in successful and sustained increases in CRC screening rates contained several key components such as EMR audits and subsequent feedback, combined patient and provider education and reminders, and the use of non-physician staff to facilitate the screening process. The intervention was structured as follows: (1) Baseline chart/EMR audit for CRC screening rates; (2) Physician and non-physician (i.e. medical assistant or staff nurse) education regarding CRC screening guidelines; (3) Implementation of expanded non-clinician staff roles (to

act as CRC screening patient navigator to review of patient's CRC screening status, provide reminders to patient and physician regarding need for CRC screening, and engage in post-visit discussion regarding importance of CRC screening/set up order for colonoscopy when appropriate) (Ornstein et al., 2010). Although the intervention requires restructuring of practice workflow and could take a significant amount of time and resources to successfully implement, its impact on CRC screening has the potential to be significant. However, a key point to consider with regard to the expansion of the non-clinician role is the potential for a breach in scope of practice. Implementing practices would need to ensure that the tasks involved with the MA role expansion to facilitate screening efforts were within the limits of the medical assistant scope of practice.

Table 1.

Literature Review: Synthesis of Key Findings

Synthesis of Key Findings
A multi-strategy intervention that is successful at achieving a sustained increase in CRC screening rates contains several key components:
• EMR Audits / Feedback
• Combined Patient and Provider Education
• Combined Patient and Provider Reminders
• Use of non-provider staff to facilitate the screening process

An additional key point is that even though provider –focused CRC screening interventions did produce an increase in the number of screening colonoscopy orders, nearly 50% of the patients that received an order for screening colonoscopy did not follow through with the procedure (Sequist et al., 2009). This highlights the need for

further investigation to determine why patients do not follow through after a recommendation and/or order for screening is provided.

Conclusion

Electronic medical records provide a useful means to facilitate CRC screening efforts, but must effectively encourage complete documentation of screening status among providers. Furthermore, EMRs can be utilized as a reminder source for CRC screening, but should be combined with patient- and provider-targeted intervention strategies to produce the best screening results. Effective patient-provider communication is also a key factor in determining whether providers recommend CRC screening and whether patients even consider completing a screening exam. This reveals a need for provider education regarding effective communication skills and their consequential effect on a patient's informed decision-making process. Lastly, patients represent an untapped resource for increasing CRC screening rates due to the fact that it is not clear why patients fail to follow through with screening colonoscopy even after receiving the recommendation and order for the exam.

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APPENDIX A **Author, Year, Source**	**Purpose/Focus of the Study**	**Study Design**	**Sample**	**Method**	**Main Findings**
Ornstein, Nemeth, Jenkins, & Nietert (2010) Medical Care	"To assess the impact of a quality improvement intervention combining electronic medical record (EMR) based audit and feedback, practice site visits for academic detailing and participatory planning, and the "best-practice" dissemination on CRC screening in primary care practice" (p. 900).	Two-year group randomized trial	"Physicians, midlevel providers, and clinical staff members in 32 primary care practices in 19 states caring for 68, 150 patients 50 years of age or older" (p. 900).	- Practices included were in the Practice Partner Research Network (PPRnet) and use the same EMR and pool quarterly QI and research data. -QI intervention conducted in intervention group practices between Jul. 1, 1007 and June 30, 2009 with 3 components: (1) EMR-based audit and feedback; (2) practice site visits for academic detailing and participatory planning; and (3) "best-practice" dissemination during annual meetings. -After 2-year intervention, study practices repeated structured EMR review and update as done at baseline.	-In intervention practices, patients 50-75 years old exhibited 60.7% to 71.2% improvement in being UTD with CRC screening than patients in control practices (from 57.7% to 62.8%) -Screening recommendations increased more in intervention practices with adjusted difference of 7.9% (CI 95%, 3.8%-6.1%) -Wide interpractice variation exhibited throughout intervention
Baker et al. (2009) Quality & Safety in Health Care	To determine whether the implementation of a three-phase intervention	Three-phase Intervention Study, Quasi-experimental	Patients 50+ yrs seen between Jan. 1, 2003 and Oct. 31, 2006, and who were not current	Three-phase intervention program: 1. EMR reminders, 2. Physician and medical assistant (MA) education about CRC screening	-Referral rate for colonoscopy at baseline was 6.0%. -Immediate screening rates were minimally affected by

	program will improve the rate of CRC screening.		for CRC screening at time of visit. Total of 152, 271 patient encounters.	guidelines, and 3. Redesign of patient visit workflow with expanded MA role to review patients' CRC screening status and recommend testing (when appropriate) to improve the rate of CRC screening.	provider education and electronic reminders. -There was a sustained increase in colonoscopy referral order rate to 13.4% with addition of expanded MA role, a 123% relative improvement.
Geller et al., 2008 Medical Care	A computer-based intervention, the Patient/Provider Communication Assistant (PPCA) was developed and pilot tested to "facilitate discussion and provider recommendations for CRC screening" (p. S36). Hypothesis: "Patients exposed to the PPCA would be more likely to have a discussion with and recommendation from their provider, which would lead to a plan to receive CRC	Mixed model analyses using a pre/post quasi-experimental design	Comparison group – 177 patients Intervention group – 142 patients Adult patients age 50-80 yrs. Five family care practices including 2 community health centers with 12 physicians.	Computer tablet used to test PPCA (collected data/ educated patients/printed personalized patient/provider notes to) ability to facilitate discussions regarding CRC screening. Patient results compared during comparison and intervention periods on provider CRC screening discussions and recommendations as well as patient CRC screening intentions. Age, literacy, and education were examined and used as covariate measures.	After PPCA implementation, providers discussed CRC screening, especially colonoscopy, more frequently than with comparison group (*P*-values=0.4 and o.o1, respectively). CRC screening was recommended by providers more frequently to patients in the intervention group than in control group ($P = 0.02$). Patients in the intervention group planned to be screened (specifically via colonoscopy) more frequently after intervention than in comparison group ($P = 0.003$). Between group and covariates, no interaction found. PPCA was considered to be easy to

	screening" (p. S36-S37).				use by 95% of all patients regardless of age or education.
Ayanian, Sequist, Zaslavsky, & Johannes (2008) Journal of General Internal Medicine	"To determine whether surveillance colonoscopy can be increased among overdue patients by reminders to their primary care physicians" (p. 762).	Randomized, controlled trial	141 physicians in 2 Massachusetts primary care networks "717 patients that had colorectal adenomas removed 1995 thru 2000 and had no follow-up colonoscopy identified via automated review of electronic records through Mar. 2006" (p. 762) Patients in hospital affiliated practices (n = 375) Patients in integrated group practice (n = 342) Patients randomized to	Physicians with patients in intervention group received a letter notification of potential need for colonoscopy. A letter was also sent to the patients that recommended colonoscopy and encouraged them to contact their physician to schedule the colonoscopy. Physicians were also given response form with letter "asking them to report whether they intended to send a reminder letter or call each of their patients in the intervention group to recommend colonoscopy" (p. 763). They were also asked to report reasons why any patient should not have the procedure. Second letter and response form was sent to physicians that did not respond within 1 month.	"Among 358 patients whose physicians received reminders, 33 (9.2%) patients underwent colonoscopy within 6 months, compared with 16 (4.5%) of 359 patients whose physicians did not receive reminders (P = 0.009)" (p. 762). "New adenomas or cancer were detected in 14 (3.9%) intervention patients and 6 (1.7%) control patients (P = 0.06), representing 42.4% and 37.5% of patients who underwent colonoscopy in each group, respectively" (p. 762). "Despite using advanced electronic health records to identify eligible patients, 22.5% of enrolled patients had a prior follow-up colonoscopy ascertained only by visual record review, and physicians reported 27.9% of intervention patients were no longer active in their practice" (p. 762).

			control group (n =359) Patients randomized to intervention group (n = 358)	When 6-month observation period was complete, "an identical mailing was sent to the patients of the control group to ensure their physicians were aware of the potential need for colonoscopy" (p. 763).	
Ling et al. (2009) Archives of Internal Medicine	The objective was "to evaluate methods for promoting colorectal cancer screening in primary care practice" (p. 47).	2X2 Factorial randomized clinical trial	10 primary care physician office practices, 599 patients eligible for screening aged 50-79 years	Study measured the "effects of a tailored versus non-tailored physician recommendation letter and an enhanced versus non-enhanced physician office and patient management intervention on CRC screening adherence" (p. 47). "Primary end point was medical-record-verified flexible sigmoidoscopy or colonoscopy" (p. 47). "Statistical end-point analysis (according to randomization intent) used generalized estimating equations to account for correlated outcomes according to physician group" (p. 47).	289 patients out of 599 (48.2%) received lower endoscopy over one-year period. More specifically, lower endoscopy rates were as follows: -tailored letter and enhanced management group 81 of 152 (53.3%) -non-tailored letter and enhanced management group 103 out of 190 (54.2%) -tailored letter and non-enhanced management group 58 out of 133 (43.6%)

					-non-tailored letter and non-enhanced management group 47 out of 124 (37.9%) 1.63-fold increase in odds of completing colonoscopy or flexible sigmoidoscopy with enhanced office and patient management (95% CI, 1.11-2.41; *P* = .01). 1.08-fold increase in odds of completion with tailored letter (95% CI, 0.72-1.62; *P* = .71).
Sequist, Zaslavsky, Marshall, Fletcher, & Ayanian (2009) Archives of Internal Medicine	"To compare the individual and joint impact of personalized mailings to patients and electronic reminders to primary care physicians to promote CRC screening within a multisite group practice" (p. 364).	Randomized controlled trial	11 ambulatory health centers 21, 860 patients aged 50 to 80 years overdue for CRC screening 110 primary care physicians	Patients were randomly assigned to receive mailings that contained education pamphlet, FOBT kit, and instructions for "direct scheduling of flexible sigmoidoscopy or colonoscopy" (p. 364). Physicians randomly assigned "to receive electronic reminders during office visits with patients overdue" for CRC screening (p. 364).	Patients that received mailings had higher screening rates than those that didn't (44.0% vs 38.1%; *P* < .001). As age increased so did the effect: +3.7% for ages 50-59 yrs; +7.3% for ages 60-69 yrs; and +10.1% for ages 70-80 yrs (for trend *P* = .01) (p. 364). For patients whose physicians received electronic reminders and patients in the control group, screening rates were similar (41.9% vs 40.2%; *P* = .47) (p. 364).

				Primary outcome – "Receipt of FOBT, flexible sigmoidoscopy, or colonoscopy over 15 months" (p. 364). Secondary outcome – detection of colorectal adenomas	Among patients having 3+ primary care visits, electronic reminders tended to increase screening rates (59.5% vs 52.7%; *P* = .07) (p. 364). With patient mailings (5.7% vs 5.2%; *P* = .10) and physician reminders (6.0% vs 4.9%; *P* = .09) adenoma detection rates were typically increased (p.364).

Assessment of Patient Barriers to and Facilitators of Screening Colonoscopy: Utilizing patient perspectives to formulate recommendations to improve colorectal cancer screening rates.

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Abstract

Background: Only a limited amount of research has been directed toward determining patient factors that influence patient completion of screening colonoscopy. Most studies have been provider-focused and have assessed multiple interventions formulated to increase colorectal cancer (CRC) screening within the primary care setting. A pilot study utilizing focused patient interviews to determine patient barriers to and facilitators of screening colonoscopy was conducted. Recommendations for improving CRC were formulated based on the interview results.

Methods: Participants included 25 in-patient adults age 50 years and older (mean age 65.1 years) admitted to a regional medical center. A qualitative approach was used to conduct 25 focused patient interviews from February 27th through March 9th, 2015 regarding CRC screening history. The interviews were transcribed and systematically analyzed between March and April 2015 to detect recurring patterns and themes related to screening colonoscopy completion and/or lack thereof. Descriptive statistics were used to summarize additional sample characteristics such as gender, education level, and income level.

Results: Among those who had received a screening colonoscopy (44%, 11 of 25), provider recommendation was the most influential factor for procedure completion, followed by the combination of provider plus family member recommendation. Consequential findings revealed that due to Medical Necessity, several patients (32%, 8 of 25) had obtained a colonoscopy for non-screening purposes *and* were past due for screening at the time of completion (75%, 6 of 8). Of the six patients who received an initial colonoscopy out of medical necessity *and* were past due, half had never received a prior recommendation, while the other half reported Lack of Insurance/Financial

Concern(s) and Refusal/Fear as reasons for not completing colonoscopy at the time of initial recommendation. Among those that had never had a colonoscopy for any reason (24%, 6 of 25) barriers that were identified include 1) Lack of Recommendation/Knowledge (50%, 3 of 6), 2) Lack of Insurance/Financial Concern(s) (16.7%, 1 of 6), 3) Scheduling conflict (16.7%, 1 of 6), and 4) Refusal/Fear (16.7%, 1 of 6).

Conclusions: The findings of this quality improvement project identified facilitators and barriers from the patient perspective as to why they participated in CRC screening. This information will help providers provide appropriate education to patients and identify potential barriers to obtaining a colonoscopy and address identified concerns.

Among all cancer types, colorectal cancer (CRC) remains the third most common and is the second leading cause of cancer-related deaths among both men and women in the U.S. (Centers for Disease Control and Prevention [CDC], 2014a). It is estimated that in 2014, 71,830 men and 65,000 women will be diagnosed with CRC in the United States, and of those diagnosed, 26, 270 men and 24, 040 women will die (American Cancer Society [ACS], 2014). Years of data have established that CRC incidence and death rates increase with age. More specifically, "90% of new cases and 93% of deaths" occur in those age 50 years and older (ACS, 2014 p. 5). Incidence rates are 25% higher in African American individuals, while mortality rates are higher among men than women in general by 30% to 40% (ACS, 2014).

Among screening-eligible adults aged 50 to 75 years, only one in three have had a colonoscopy according to current CRC screening guidelines (Centers for Disease Control and Prevention [CDC], 2013). Current screening guidelines state that adults aged 50 to 75 years should obtain one of the following screening exams: 1) Home fecal occult blood test (FOBT) or fecal immunochemical test (FIT) yearly; 2) Flexible sigmoidoscopy every five years, plus FOBT/FIT every three years; and/or 3) Colonoscopy every 10 years (U.S. Preventative Services Task Force [USPSTF], 2008; Rex et al., 2009). Colonoscopy remains the gold-standard screening exam for CRC as it allows for visualization of the colon as well as the identification and removal of pre-cancerous lesions, or polyps. Endoscopic removal of polyps during screening colonoscopy has the potential to prevent up to 80% of colorectal cancers (U.S. Department of Health and Human Services [HHS], n.d.).

Although efforts to increase CRC screening awareness has led to an increase in CRC screening rates from approximately 52% to 59% nation-wide, screening rates in the U.S. still fall short of the American Cancer Society's 2015 goal to screen 75% of those eligible (U.S. Department of Health and Human Services [HHS], 2014; ACS, 2014). Among eligible adults in the state of Kentucky, CRC screening rates remain low when compared to other states. Statistics reveal that Kentucky's CRC screening rate (59.3 – 63.5 per 100,000) is among the lowest when compared to other states, and it falls into the highest rate categories for CRC incidence (42.7 – 48.9 per 100,000) and CRC- related deaths (16.5 – 19.9 per 100,000) (Center for Disease Control and Prevention [CDC], 2014b).

Research findings were reviewed from studies that evaluated strategies to improve CRC screening. Multiple strategies have been instituted in primary care practices to increase provider adherence with CRC screening, and these have been evaluated for effectiveness. The most successful CRC screening strategies are those that incorporate screening activities at multiple points during the primary care experience and incorporate a combination of patient-focused and provider-focused interventions (Baker et al., 2009; Geller et al., 2008; Ornstein, et al., 2010; Sarfaty, M., 2009; and Sequist et al., 2009). However, during the review process, a significant gap was identified.

Studies demonstrated that regardless of improvement in provider adherence to assess for CRC risk and offer CRC screening, patients still failed to undergo CRC screening, especially screening colonoscopy. Sequist et al. (2009) found that although their intervention to improve provider adherence did result in a modest increase in screening colonoscopy prescriptions, this increase "did not produce a corresponding

increase in completed procedures, as nearly half of the patients" did not follow through with the procedure (p. 369). Subsequent to this finding, an additional literature search was performed to determine the barriers and/or facilitators to screening colonoscopy from the patient perspective, but very few studies were found.

Provider recommendation was determined to be one of the most influential factors to screening colonoscopy attainment among patients (Feeley, Cooper, Foels, & Mahoney, 2009; Sarfaty, 2008). Patients also identified that "knowing someone who has/had cancer" was a key motivating factor in their decision to follow-through with CRC screening" (Feeley et al., 2009, p. 304). Three of the most-reported patient-perceived barriers were fear of the test, test discomfort/embarrassment, and fear of the test result (Feeley et al., 2009). Because there were a limited number of studies investigating the barriers to and facilitators of CRC screening from the patient perspective, a practice inquiry project was developed.

Methods

Study Design

A pilot study utilized focused patient interviews to assess the CRC screening history as well as barriers of and facilitators to screening colonoscopy among eligible patients from February 27th through March 9th, 2015. Key findings were used to formulate recommendations for future practice and research.

Sample

Participants were recruited from a convenience sample of in-patients admitted to two Medical-Surgical/Orthopedic units at Frankfort Regional Medical Center. Respondents included 25 adults who were selected from a sample of daily departmental

census sheets from February 27th through March 9th, 2015 based on the following inclusion criteria: 1) age 50 years or greater, 2) ability to comprehend and speak English, and 3) ability to give informed consent. Those excluded from the sample included those who were cognitively/developmentally unable to consent, who were deemed ward of the state, were unresponsive and/or terminally ill. As per current CRC screening guidelines, which indicate screening colonoscopy should begin at age 50, any adult 50 years and older, who met the inclusion criteria, was given the opportunity to participate until the sample size of 25 respondents was reached. Informed consent was obtained from each participant prior to the interview. The Portsmouth Regional Hospital Institutional Review Board approved this practice inquiry project.

Instruments

An interview tool was utilized during the focused interviews to guide the data collection and interview process (see Appendix A). All answers were transcribed during the time of the interview. Demographic information that was collected included characteristics such as age, gender, ethnicity, education level, and income level. Participants who reported completion of screening colonoscopy were asked to discuss the factors that influenced their decision to complete the procedure, state the referral source for screening, and the age at which the colonoscopy was completed. Participants who denied ever receiving a screening colonoscopy were asked to state whether the procedure had ever been recommended and if so, who recommended it. They were also asked to discuss what factors contributed to their lack of procedure follow-through. At the conclusion of the interview, all participants were given the opportunity to asked questions regarding CRC screening/colonoscopy. Those who had never received screening were

then asked to rate their likeliness to complete a screening colonoscopy on a 5-point Likert scale– 5 “Very Likely”; 4 “Somewhat Likely”; 3 “Not Sure”; 2 “Not Very Likely”; and 1 “Not at all Likely.” All participants were given an educational handout from the American college of Gastroenterology website entitled, “Test Your Knowledge of Colorectal Cancer Screening” at the conclusion of the encounter, which covers CRC statistics, risk factors and symptoms, importance of screening and screening recommendations (American College of Gastroenterology [ACG], n.d.). The primary investigator completed all encounter activities independently.

Data Analysis

The primary investigator, between February and April 2015, analyzed the transcribed participant data utilizing constant comparative analysis to look for indicators of categorical behaviors and/or events by which the data was then coded (Gillis & Jackson, 2002). The transcribed data was entered as text into a series of Word document tables to facilitate the analytical process. Demographic information was compiled into an Excel spreadsheet and descriptive statistics were used to determine mean age, percentage of male versus female, percentage of reported ethnicities, income, and education level.

Participants were divided into two major categories according to screening colonoscopy status:1) Had Screening Colonoscopy (4 subcategories – On time, Early, Late-No Prior Recommendation, and Late-Prior Recommendation) and 2) Has Never Had Screening Colonoscopy. Among those who had not had a screening colonoscopy, a third category emerged: Had Colonoscopy – Not Considered Screening (3 subcategories – Early, Late-No Prior Recommendation, and Late-Prior Recommendation). Within the

categories and subcategories, facilitator and/or barrier themes as well as overarching themes were identified.

Results

There were a total of 25 participants who participated in this project. The mean age was 65.1 years; 76.9% (19 of 25) were female and 23.1% (6 of 25) were male; and 96.2% (24 of 25) were Caucasian, while only 3.8% (1 of 25) were African American. Sixty-four percent of the sample population reported an education level of high school graduate or higher and 92% reported an income level of $50,000 or less per year.

Figure 1.

Education Level of Sample

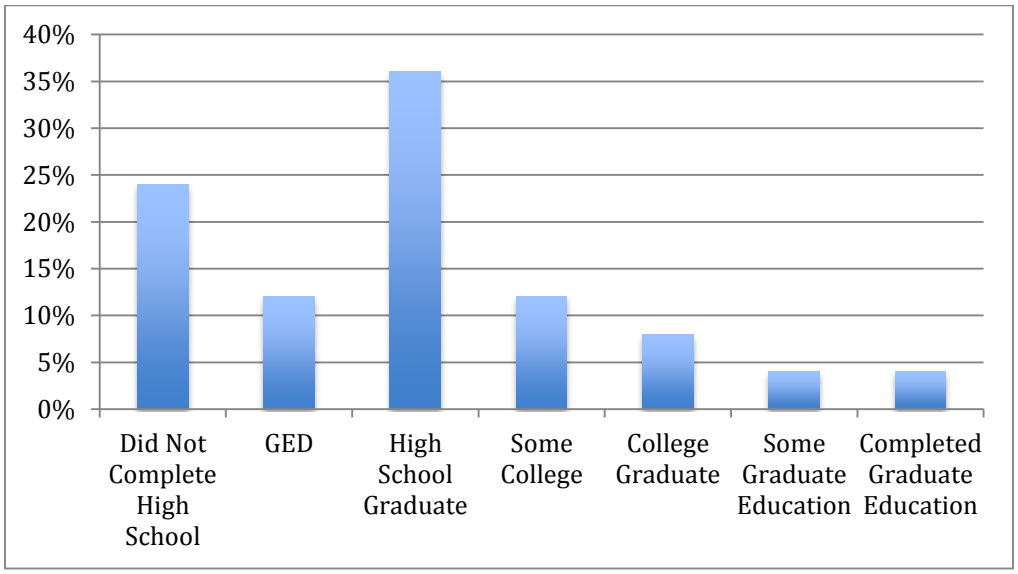
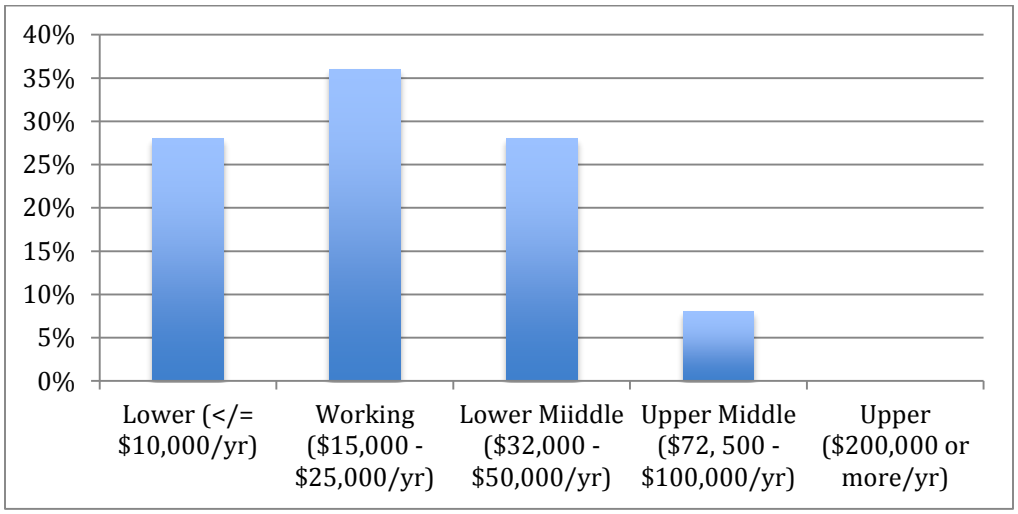


Figure 2.

Income Level of Sample



Note. Income classes from Thompson, W. & Hickey, J. (2005) Society in Focus. Boston, MA: Pearson, Allyn, & Bacon.

Facilitating Themes

Eleven of the 25 participants (44%) reported having received a screening colonoscopy, over half of which were received late, or after the age of 50 years. Among those eleven participants, 2 facilitating themes were identified that facilitated their ability to complete the colonoscopy: 1) Provider Recommendation (10 of 11 participants; 90.9%) and 2) Provider Plus Family Member Recommendation (1 of 11 participants; 9.1%). The ten participants that received screenings solely based on provider recommendation stated their primary care physician (PCP) "recommended/ suggested I have it done" or "told me to have it done." Three were screened on time (age 50), 2 were screened early (before age 50), and 5 were screened late (over age 50). All five participants who received late screening after the age of 50 (mean age 54.7 years), reported that no prior recommendation was ever received. One participant (current age 73) stated, "My primary doctor recommended for the first time last year so I got it done."

The single participant who received screening based on Provider Plus Family Member Recommendation, received screening late (at age 60) and stated, "My primary doctor recommended it earlier but I refused to do it out of fear. My sister kept explaining how important it was…that they take out polyps to prevent colon cancer, so I finally agreed to do it." In addition to provider plus family member recommendation, refusal/fear was identified as an overarching barrier theme because despite repeated provider recommendation, out of fear, the patient did not complete a screening colonoscopy until additional family member recommendation was received.

Table 1.

Themes Identified Among Participants that Completed Screening Colonoscopy

Had Screening Colonoscopy *(n=11)*	***n=***	***%***
Facilitator Theme I: Provider Recommendation	10	90.9
On time (age 50)	3	30
Early (before age 50)	2	20
Late (after age 50) – NO Prior Recommendation	5	50
Facilitator Theme II: Provider Plus Family Member Recommendation	1	9.1
Late (after age 50) – Prior Recommendation ***> Fear/Refusal (barrier)***	1	9.1

Note. The > indicates overarching barrier theme among the participant that 1) completed screening colonoscopy, 2) received screening late (over age 50), and 3) received prior recommendation.

Barrier Themes

Six of the 25 participants (24%) reported that they had never received a screening colonoscopy. The interview responses of these six participants revealed four barriers to procedure completion: 1) Lack of Recommendation/ Knowledge, 2) Lack of Insurance/ Financial Concern(s), 3) Scheduling Conflict, and 4) Refusal / Fear. The Lack of Recommendation/Knowledge theme was identified from statements: "It has never been

recommended to me" (Female, age 72); "What is a colonoscopy? I have never heard of it before" (Female, age 54); and "No one has ever recommended that I have it done" (Female, age 53).

A second theme, lack of insurance/financial concern emerged. One man reported that he had "an issue with his insurance" because it "wouldn't pay for an upper scope and a colonoscopy." He stated, "at the time, the upper scope was more important…I am supposed to get it (colonoscopy) but I have to make sure it is covered because I can't pay."

The third theme, scheduling conflict was identified through, "I was supposed to get it scheduled but I've been too busy and in and out of the hospital too much to get it done." The final theme of Refusal/Fear was determined from comments like, "I've been told to do it but the thought of it has kept me from doing it" (Female, age 72).

Table 2.

Themes Identified Among Participants that Did Not Complete Screening Colonoscopy

Has Never Had Screening Colonoscopy (*n*=6)	***n=***	***%***
Barrier Theme I: Lack of Recommendation / Knowledge	3	50
Barrier Theme II: Lack of Insurance / Financial Concern(s)	1	16.7
Barrier Theme III: Scheduling Conflict	1	16.7
Barrier Theme IV: Refusal / Fear	1	16.7

A third category emerged from participants who had not received a screening colonoscopy, but rather, had a colonoscopy due to compelling symptoms (i.e. bleeding/bloody stool). The facilitating theme medical necessity was henceforth identified among these patients. Eight of the 25 participants (32%) had received a

colonoscopy that was not considered screening, but was completed due to medical necessity. These eight participants were divided into early (colonoscopy before age 50) and Late (colonoscopy over age 50), then further delineated in to Late – No Prior Recommendation and Late – Prior Recommendation. Twenty-five percent (2 of 8 participants) received colonoscopy early: one patient reported receiving a colonoscopy at age 30 because "she ate a lot of beets and it looked like blood" while another reported that she "had a colonoscopy at 46 for bleeding." Of the remaining seventy-five percent (6 of 8 participants), who received a colonoscopy after the age of 50 and due to medical necessity, half had never received a prior recommendation. Comments such as "I had bleeding (at age 53) and my doctor said I needed a colonoscopy" and "I was having constipation, pain, and bleeding…I was 55 years old" were made meaning that although Medical Necessity was considered a facilitator to colonoscopy completion, Lack of Recommendation/ Knowledge could be identified as an overarching barrier theme. The other half who had received prior recommendation, but did not complete the procedure until it was medically necessary, gave statements from which two overarching barrier themes were also revealed – Lack of Insurance/Financial Concern(s) and Refusal/Fear. One participant had a colonoscopy at age 58 for bleeding, but reported that at time it was previously recommended he "did not have insurance." Another participant gave the following statement:

> "My first colonoscopy was 5 days ago. I was having pain and went to the ER. They did a CT scan and it was abnormal with spots on my liver so they admitted me. I had a colonoscopy and they found rectal cancer. My family doctor told me to do it at age 50, but the co-pay to see the GI doctor beforehand was way too expensive."
>
> -Female, age 55

A third patient (Male, age 62) said he "had to have a colonoscopy at 57 because of a bleeding ulcer that caused bleeding into [his] bowels." He explained further that the procedure was recommended at age 50, but that he "didn't have it done because of the thought of it – just didn't want to do it."

Table 3.

Themes Identified Among Participants who had Colonoscopy- Not Considered Screening

Had Colonoscopy – Not Considered Screening (*n*=8)	**n=**	**%**
Facilitator Theme III: Medical Necessity*	8	100
Early (before age 50)	2	25
Late (over age 50)	6	75
NO Prior Recommendation ***> Lack of Recommendation/Knowledge*** (*n*=3)	3	50
Prior Recommendation ***> Lack of Insurance / Financial Concern(s)*** (*n*=2) ***> Refusal / Fear*** (*n*=1)	3	50

Note. * Compelling symptom in all cases bleeding/bloody stool. The > indicates overarching themes among those who completed colonoscopy that was 1) not considered screening, 2) late (over age 50), and 3) either had not OR had received prior recommendation.

Of the patients who reported receiving a recommendation for colonoscopy, regardless of indication and/or age at time of screening, the PCP was the most-frequently reported source of recommendation: PCP – 18 of 22 patients (81.8%); Specialist – 3 of 22 patients (13.6%); and Family Member – 1 of 22 patients (4.6%). Of the six patients who had never received colonoscopy, a 5-point Likert-scale evaluated likeliness to complete screening colonoscopy at the conclusion of the study encounter. All patients indicated that they were either very likely (2 of 6 participants) or somewhat likely (4 of 6 participants) to complete screening colonoscopy at the conclusion of the encounter.

Discussion

This quality improvement project revealed patient-identified facilitators and barriers to screening colonoscopy. The findings are consistent with those reported by Feeley et al. (2009), who utilized focus groups to determine perceived patient barriers/facilitators to CRC screening and actual barriers/ facilitators to CRC screening among providers and patients respectively. Similarities within the study findings indicated that a recommendation for CRC screening is a key determinant of CRC screening test completion. More specifically, patients indicated that they considered provider recommendation to be most effective at facilitating CRC screening test completion, while family member recommendation (i.e. spouse, child, or sibling) ranked a close second (Feeley et al., 2009).

An additional facilitator to completion of screening colonoscopy, and/or any other recommended CRC screening tests (i.e. FOBT/FIT and flexible sigmoidoscopy), was the presence of CRC symptoms. When Feeley et al. (2009) asked patients to list "factors that would influence higher screening rates," having "symptoms of CRC" ranked high among those listed, which is consistent with the findings in this study that not only revealed medical necessity to be a facilitating theme, but also identified bleeding or bloody stool, as the imposing symptom (p. 310).

Findings between both studies differed in that the most-frequently mentioned and least-frequently mentioned barriers to CRC screening were reversed. Feeley et al. (2009) reported that patients identified "fear of test" and "discomfort/embarrassment" as the most-frequently mentioned barriers and "cost" concerns to be the least-frequently identified barrier (p. 309). Another key difference was that this study focused on

screening colonoscopy and did not include FOBT/FIT or flexible sigmoidoscopy completion in its assessment of CRC screening.

This study also highlights the strength of lack of insurance/financial concern(s), or cost, has on a patient's ability to complete CRC screening because even in the presence of CRC symptoms people still delay test completion. Even individuals with insurance will delay or refuse CRC screening due to their inability to afford co-pays for office visits and procedures.

Limitations

Due to the small sample size this is not an exhaustive list of patient-identified barriers to and facilitators of screening colonoscopy. Feeley et al. (2009) identified a total of seven patient-identified CRC screening barriers: fear of test, discomfort, embarrassment, fear of results, lack of understanding, lack of time, cost (p. 309). In current clinical practice, lack of transportation and reluctance to complete the bowel prep are two additional barriers that patients have identified. Because participants were recruited from only one site this may have led to a lack of diversity in population and subsequent interview responses. A larger sample size and implementation of the study in multiple sites may have resulted in more a more ethnically and socioeconomically diverse population and may have revealed other/missing facilitators and barriers to CRC screening (Polit & Beck, 2006; Gillis & Jackson, 2002). There is also a risk of intrinsic bias due to the lack of both data source triangulation and investigator triangulation. By utilizing multiple data sources (i.e. providers and patients) and more than one investigator to collect, analyze, and interpret the data, credibility of the findings may have been enhanced (Polit & Beck, 2006). Furthermore, this study only assessed screening

colonoscopy; however, CRC screening can include FOBT/FIT and flexible sigmoidoscopy and their completion among patients should have also been assessed.

Recommendations

The overarching goal is to increase the completion of CRC screening among eligible patients. Studies have determined that practices wishing to achieve a sustained increase in CRC screening rates among providers should implement a multi-strategy CRC screening intervention program that utilizes EMR audits and feedback and includes a combination of practice-, provider-, and patient-focused reminders and education (Baker et al., 2009; Geller et al., 2008; Ling et al., 2009; Ornstein, et al., 2010; Sarafty, M., 2008; & Sequist et al., 2009). Investigation into CRC screening improvement strategies from the provider standpoint has been well established and its results have shown that many interventions can lead to a subsequent increase in CRC screening test orders (i.e. an approximate 53% to 60% increase in colonoscopy order per Sequist et al., 2009). However, there has been very little inquiry as to why nearly half of the patients who receive orders for CRC screening fail to follow through (Sequist et al., 2009).

Study findings reveal that providers must improve their efforts to overcome the patient-identified barriers to CRC screening in order to increase CRC screening rates. This indicates that there is a need for providers to assess what barriers exist for each patient then formulate their recommendations according to those identified barriers. The patient-identified barriers to CRC screening identified by this study include 1) lack of provider recommendation; 2) lack of insurance/financial concerns; 3) Refusal/Fear; and 4) scheduling conflicts. The absence of provider recommendation can be overcome through provider education that highlights consistent use of current CRC screening

guidelines and strategies to improve provider-patient communication (Yoo, Kwon, & Pfeiffer (2013). The lack of insurance and /or financial concern(s) can be remedied by: 1) assessing whether or not patients have health insurance; 2) determining what CRC screening tests are covered by the insurance; and 3) offering the FOBT as per CRC screening guidelines (Sarafty, M., 2008). To address the barrier of refusal/fear, providers must engage in effective CRC screening discussions with their patients that focus on CRC screening test options and then assess for patient understanding of the information covered (Ling et al., 2008). Lastly, scheduling conflicts related to screening colonoscopy completion could be remedied by providing patients with more convenient and flexible scheduling options such as access to evening and weekend endoscopy clinics, which are already available in some locations.

Implications for future research include the development and evaluation of a CRC screening program that utilizes not only the key components of an evidence-based multi-strategy practice intervention, but that also formulates its strategies to address the patient-identified barriers. With Americans gaining increased access to health insurance coverage through The Affordable Care Act, the insurance gap may lessen for the current and future screening-eligible populations (CDC, 2013). Additional research will be needed to evaluate the effects of greater access to coverage on all cancer-related screening activities.

Furthermore, although access to insurance has improved, this does not guarantee the affordability of CRC screening. Even with insurance coverage, patients may not be able to afford office visit or procedure co-pays. The cost of bowel preparation is also a factor. Many providers offer improved bowel preparations that result in improved patient

compliance and subsequent colonic visibility during colonoscopy. However, these improved preps are also more expensive and most are not covered entirely by insurance companies. Gastroenterology societies must advocate for the coverage of CRC screening-associated costs, creating a major implication for policy.

Conclusion

CRC screening rates in primary care may be improved with implementation of an evidence-based multi-strategy program that ensures its interventions are based upon utilizing the patient-identified facilitators and addressing the patient-identified barriers to CRC screening exams.

APPENDIX A

DATA COLLECTION/INTERVIEW TOOL

Age _____

Sex: Male / Female

Ethnicity: _____

Education level:
Did not complete High School _____ GED _____ High School Graduate _____
Some College _____ College Graduate _____ Some Graduate Education _____
Completed Graduate Education _____

Income Level:
</= $10,000/yr ____ (lower) $15,000 - $25,000/yr ____ (working)
$32,000 - $50,000 ____ (lower middle) $72,500 - $100,00 ____ (upper middle)
$200,000 or more ____ (upper)

CRC Screening history: ____ Has had a screening colonoscopy.
____ Has not had a screening colonoscopy.

_____

Interview Questions for Participants that HAVE HAD a Screening Colonoscopy:

Please discuss the factors that influenced your decision to complete a screening colonoscopy:
_____
_____
_____
_____
_____
_____
_____
_____

Please identify the referral source for your screening colonoscopy (circle one)**:**

Self referred / Primary Care Physician / Specialist

How old were you when you received your screening colonoscopy: _____

****Question & Answer Session****

Interview Questions for Participants that HAVE NOT had a Screening Colonoscopy:

Has a screening colonoscopy ever been recommended to you? YES / NO

If so, by whom: Family member / Friend / Primary Care Physician / Specialist

If a screening colonoscopy has been recommended, what factors contributed to you not following through? (Some commonly identified reasons include the following.)

Fear of the procedure/ Fear of sedation / Do not want to take bowel prep / Bad Experience by Family or Friend or Self / Financial reasons or concerns / Lack of transportation / Do not feel it is important

Can you please elaborate?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

****Question and Answer Session****

How likely are you to complete a screening colonoscopy after completing this study encounter?

Very Likely	Somewhat Likely	Not Sure	Not Very Likely	Not at All Likely
5	4	3	2	1

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DNP Practice Inquiry Project Conclusion

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Colorectal cancer (CRC) is the second-leading cause of cancer-related deaths in the United States, and its negative impact can be reduced with completion of recommended screening exams. However, approximately one in three screening-eligible adults have not been screened according the recommendations (CDC, 2013). This striking quote by CDC Director, Tom Frieden, M.D., M.P.H., summarizes the current situation:

> *More than 20 million adults in this country haven't had any recommended screening for colorectal cancer and who may therefore get cancer and die from a preventable tragedy* (CDC, 2013).

Evidence shows that CRC screening rates in primary care can be improved with the implementation of an evidence-based multi-strategy practice intervention program that includes 1) EMR audits/feedback, 2) combined patient and provider education, 3) combined patient and provider reminders, and 4) utilizes non-provider staff to facilitate the screening process (Baker et al., 2009; Sarfaty, 2008). These interventions have resulted in increased rates for provider CRC screening recommendations and an increase in the number of screening colonoscopies ordered. However, despite the increase in colonoscopy orders, half of the patients that receive those orders fail to follow through with the procedure (Sequist et al., 2009). This practice inquiry project was conducted to determine the patient-identified barriers to and facilitators of screening colonoscopy.

Despite the study's limitations, important implications for future practice, research and policy were revealed. The findings were consistent with those of Feeley et al. (2009) in that it determined provider recommendation to be most

influential factor in determining whether a patient will complete a screening colonoscopy. The importance of family member recommendation with regard to exam completion was also highlighted. Patient-identified barriers included lack of recommendation/ knowledge, lack of insurance/financial concern (s), scheduling conflicts and refusal/fear. To overcome these barriers, providers must assess what barriers exist for each patient and tailor their CRC screening recommendations accordingly.

Overall study findings reveal that CRC screening rates in primary care may be improved with the implementation of an evidence-based multi-strategy practice program that ensures its interventions are 1) based upon utilizing the patient-identified facilitators and 2) address the patient-identified barriers to CRC screening exams.

Future research may therefore benefit from the development and evaluation of a CRC screening program that employs not only the key components of an evidence-based multi-strategy practice intervention, but that also formulates its strategies to address the patient-identified barriers. Additional research will also be needed to determine the affect that The Affordable Care Act and its increased access to health insurance has had on cancer-related screening activities. Furthermore, increased access to coverage does not guarantee the affordability of CRC screening and its related costs (i.e. co-pays, deductibles, and bowel preparations). Gastroenterology societies must advocate for the affordability of CRC screening at the policy level in order to ensure that cost-related barriers do not remain an issue for patients – even those with health insurance coverage.

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STATEMENT OF COMPLIANCE

The Institutional Review Board at Portsmouth Regional Hospital is organized and operates according to applicable laws and regulations governing research involving human subjects.

These include, when applicable, statutes of the State of New Hampshire and regulations of the Food and Drug Administration (21 CFR 50 and 56) and Department of Health and Human Services [45 CFR 46 (the"Common Rule") and 45 CFR 164 (the Health Insurance Portability and Accountability Act, HIPAA)].

In addition, the IRB conforms to Good Clinical Practice (GCP) guidelines of the International Conference of Harmonization (ICH); to the extent these do not contradict DHHS and FDA regulations.

7 April 2015

AnneMarie Winkler
IRB Administrator

Date

Portsmouth Regional Hospital

February 4, 2015

H. Nicole Barker Cox, RN, BSN, CGRN
Frankfort Regional Medical Center
299 Kings Daughters Drive
Frankfort KY 40601

Dear Ms. H. Nicole Barker Cox,

This letter is to notify you that the protocol entitled "**Assessment of Patient Barriers to and Facilitators of Screening Colonoscopy: Utilizing patient perspectives and related clinical and sociodemographic factors to formulate to formulate recommendations to improve colorectal cancer screening rates**" has been approved by the IRB Committee, at the February 4, 2015 IRB meeting.

We ask that you **promptly** (no greater than five days) report to the IRB all adverse events that are serious, unexpected and related to the research as well as any unanticipated problems involving risk to human subjects or others.

Changes in the research plan (including but not limited to the protocol, informed consent, recruitment practices etc.) must be submitted to the IRB for approval, except where necessary to eliminate apparent immediate hazards to human subjects. And ask that you will promptly report to the IRB any **deviations** from the research plan that, may or may not compromise a subject's safety and/or the integrity of the study data.

This approval does not affect continuing review which will expire **February 4, 2016**. Please submit all pertinent literature for review three (3) weeks prior to the expiration date. **No research activity (including data analysis) may continue past the IRB expiration date** unless provided an adequate continuing review.
Best of Luck in your research.

Sincerely,

Molly Buzdon, MD
Institutional Review Board Chairperson
Portsmouth Regional Hospital

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