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Advancing Colorectal Cancer Screening Adherence in a Community Hospital: Consultative Report

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ADVANCING COLORECTAL CANCER SCREENING ADHERENCE IN A COMMUNITY HOSPITAL: CONSULTATIVE REPORT

BY

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A doctoral project submitted to the faculty of the Medical University of South Carolina in partial fulfillment of the requirements for the degree Doctor of Health Administration in the College of Health Professions

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Chair, Project Committee	Daniel Brinton, PhD	4/27/2021 Date
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I want to thank God for giving me the strength to persevere in the face of major crises such as hospitalization, family death, family mental disease, and a national pandemic. My eyes well up with tears as I write these sentences.

I'm always surprised I've made it this far. It would not be possible to complete this doctoral project without the love and support of so many wonderful people around me. I only have room to mention a few, although so many more are in my heart.

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Committee:	Jillian Harvey, PhD
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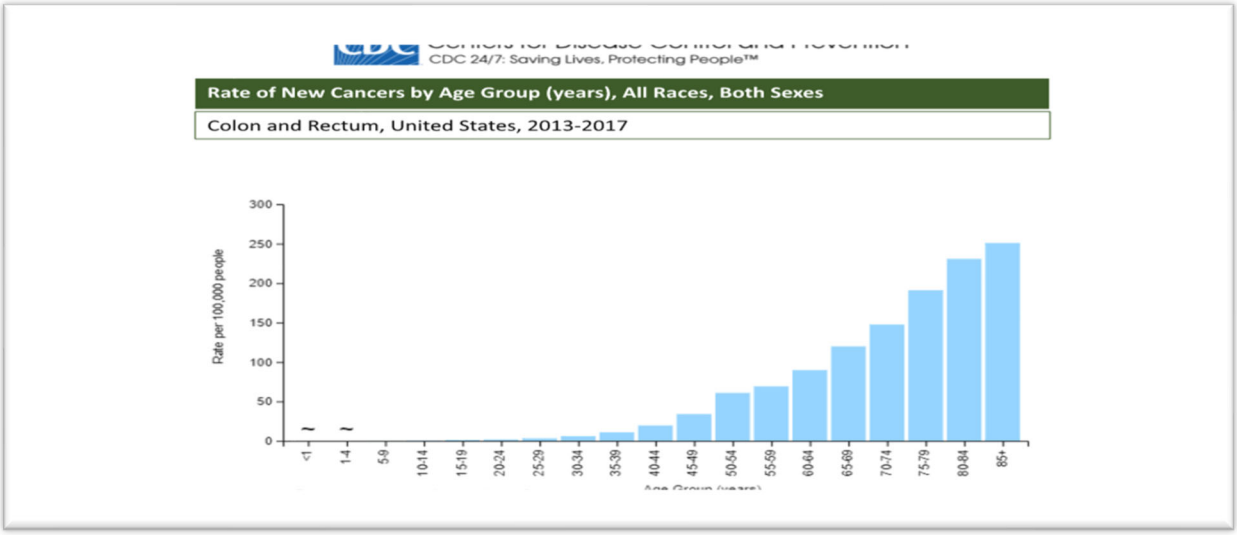
1 CHAPTER I INTRODUCTION

1.1 Background

Research indicates that colorectal cancer (CRC) is the second leading cause of cancer-related deaths in the United States that affects women and men and the third most prevalent cancer in women and men (CDC, 2020). The United States Cancer Statistics provides interactive data visualizations of colorectal cancer incidence (number of new cases) and deaths (CDC, 2020). Graphs show national and state-level CRC screening data by age and race/ethnicity. The trends in cancer incidence come from health systems, physician offices, and labs across the nation. Several variables, such as age, race, and sex, pose an increased CRC risk (CDC, 2020). In 2017, for every 100,000 people, the United States had a CRC new incident rate of 37, and 14 died of colorectal cancer (CDC, 2020). Figure 1 shows the CRC incidence increases with older age groups (CDC, 2020).

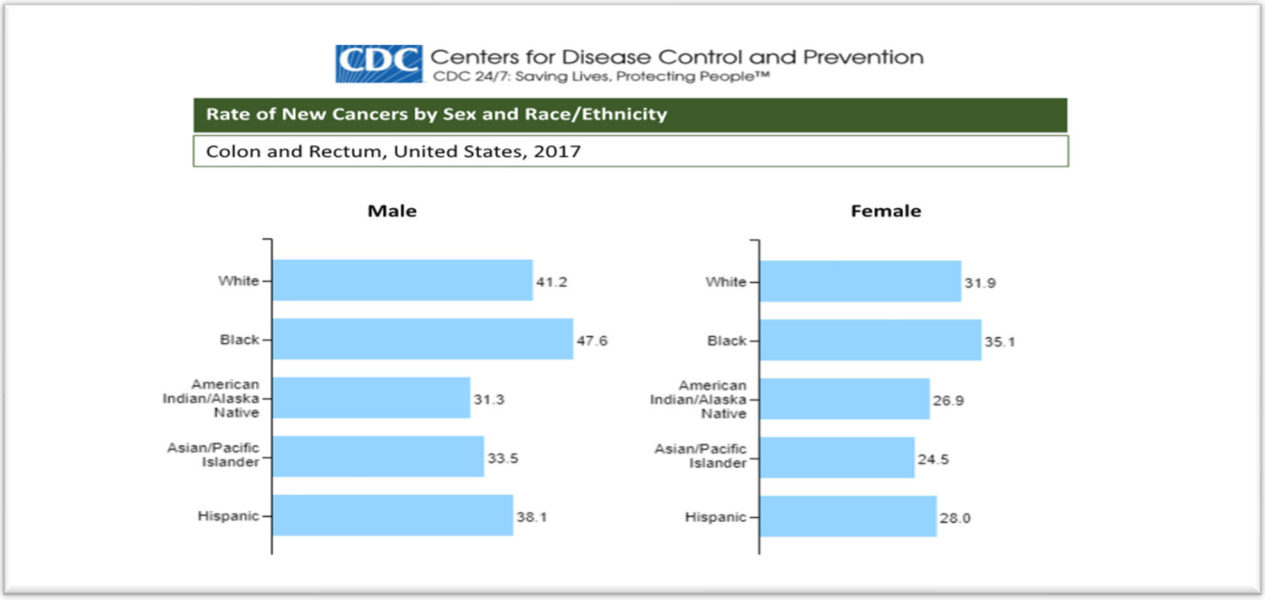
Figure 1: Rate of New Cancers by Age Group



Reference: (CDC, 2020)

Figure 2 shows CRC is more prominent in African Americans in both males and females in the United States, 47.6 and 35.1, respectively (CDC, 2020).

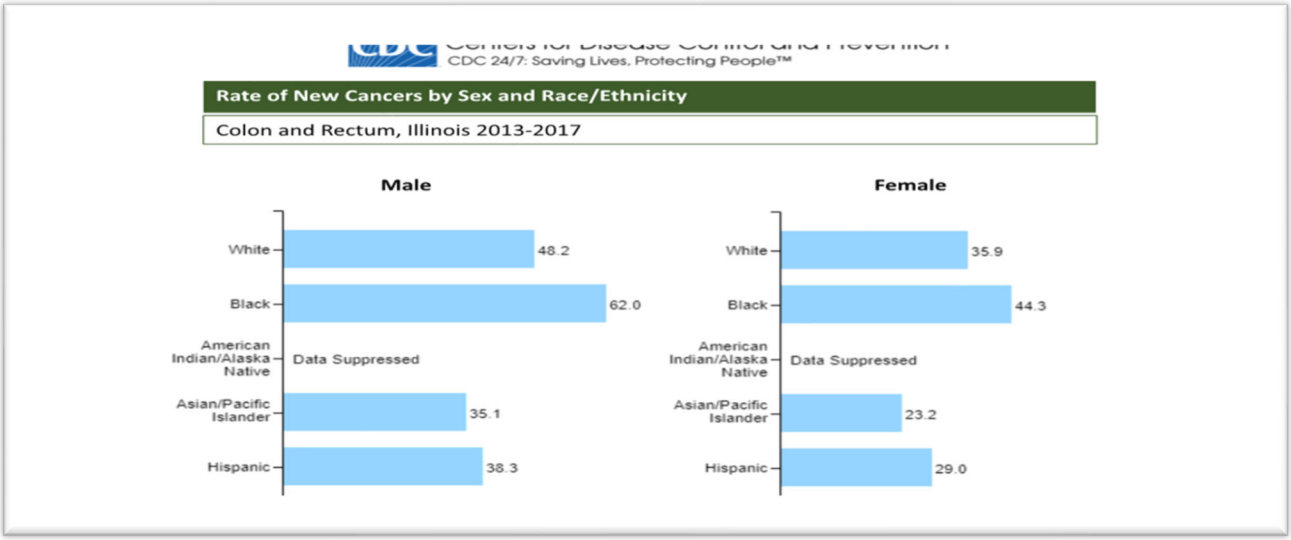
Figure 2: Rate of New Cancers by Sex and Race/Ethnicity



Reference: (CDC, 2020)

The latest CRC incidence rate for Illinois is 40 for every 100,000 people, and the state reported 31,207 new colon and rectum cancer cases in 2013-2017. There were 12,246 reported in Cook County, the largest County in Illinois. For every 100,000 people in Illinois, 15 died of colorectal cancer. Illinois has one of the highest new incident rates in CRC relative to the United States. As indicated in Figure 3, CRC is more prominent in African Americans in both males and females in Illinois at 62.0 and 44.3 per 100,000, respectively (CDC, 2020).

Figure 3: Rate of New Cancers by Sex and Race/Ethnicity



Reference: (CDC, 2020)

Research shows that the most successful commitment to colorectal cancer screening criteria is between 50 and 75 (Brenner, Stock, & Hoffmeister, 2014). However, the American Cancer Society is now urging clinicians to screen patients for colon cancer at the age of 45 rather than 50, even if they have no symptoms or a personal or family history of the disease. Many lives are hoped to be saved by closing the five-year void, according to a global group of medical experts (Goss, 2018). If detected in the early stages, CRC is the most treatable and, in most cases, the most preventable cancer (Battaglino, 2018). Additionally, researchers indicate that colonoscopy screening has a more significant impact in preventing CRC than other screening options due to detecting and removing colorectal polyps during the procedure (Brenner, Stock, & Hoffmeister, 2014). According to Goss (2018), screening recommendations for patients aged 76 to 85 should be taken collaboratively with physicians based on patient needs, life expectancy,

clinical status, and previous screening experience. Individuals above the age of 85 should be discouraged from further screening.

1.2 Problem Statement

The National Colorectal Cancer Roundtable (NCCRT) is a national coalition of public, private, and voluntary organizations seeking to minimize the occurrence and mortality of colorectal cancer in the United States by collaborative leadership, strategic planning, and advocacy (Levin et al., 2002). NCCRT was founded in 1997 by the American Cancer Society (ACS) and the Centers for Disease Control and Prevention (CDC) (Levin et al., 2002). According to the NCCRT, the lack of colorectal screening is a national concern, and their "80 % in Every Community" campaign is working towards the goal of getting 80 % of adults aged 50 and older screened by eliminating obstacles, because everyone needs to live a life free from colorectal cancer (Wagner, Burgess, & Britt, 2019).

Provident Hospital, part of the Cook County Health System, is an 85-bed community hospital in Chicago, Illinois. Provident was the first private hospital in Illinois to provide internship programs to African American physicians and provide a nursing school to educate African American women. It was also one of the first African American hospitals to have postgraduate courses and residencies for African American physicians and the first African American hospital approved by the American College of Surgeons with complete graduate surgical training.

As with most hospitals, trends in Provident inpatient admissions have decreased over the years. However, outpatient visits, elective surgeries, procedures, diagnostic tests, and ED visits have increased. Provident hospital visit volume includes 30,000 ED visits per year without ambulance runs and more than 120,000 outpatient visits.

As Provident continues to undergo significant transformation, leaders will focus on areas that require substantial improvement, especially cost optimization, improving quality of care, and patient experience. At Provident Hospital, we noted colorectal screening rates ranging from 60-67% and colonoscopy cancellation rates ranging from 30-40%. As a result, improving the Endoscopy service line is a significant initiative for Provident in FY2021.

Research indicates these types of cancellation rates lead to heightened patient risk of CRC, wasted resources, and reduction of an endoscopy service's overall efficiency that may result in a late-stage diagnosis of colorectal cancer and a grimmer clinical outlook (Kalayjian et al., 2015).

1.3 Research Questions and Objectives

The consultative report will examine possible factors causing low colorectal cancer screening rates, such as patient cancellations, and recommend interventions to achieve and sustain the national goal of 80% colorectal screening rate within the Provident population. Identifying patterns in different factors can provide evidence for developing quality management programs, particularly for vulnerable populations. A retrospective review of all procedure cancellations over 24 months helped address the following study questions. The questions are:

1. What patient demographics are most associated with colonoscopy screening cancellations?
2. What are the significant factors associated with colonoscopy screening cancellations?

This report surveyed various aspects of colorectal compliance. In addition, a systematic overview of the causes and characteristics of colorectal screening cancellations is provided. This report recommends interventions to improve colorectal screening compliance and reduce screening cancellations.

This consultative report will benefit Provident patients and the community by increasing colorectal screening rates and decreasing CRC risk. The consultative report will also be helpful to other community hospitals and endoscopy practices.

1.4 Conceptual Framework

A model was created by the National Academy of Engineering and the Institute of Medicine that describes the patient's role in a healthcare system (Compton W. D., Fanjiang, Grossman, & Reid, 2005). This model has four healthcare levels: the actual patient, the organization, the care team, and the environment (Figure 4). Taking the healthcare levels into consideration is particularly helpful in explaining patient variables' affecting colorectal cancer screening rates across the overall healthcare system (Compton, Fanjiang, Grossman, & Reid, 2005).

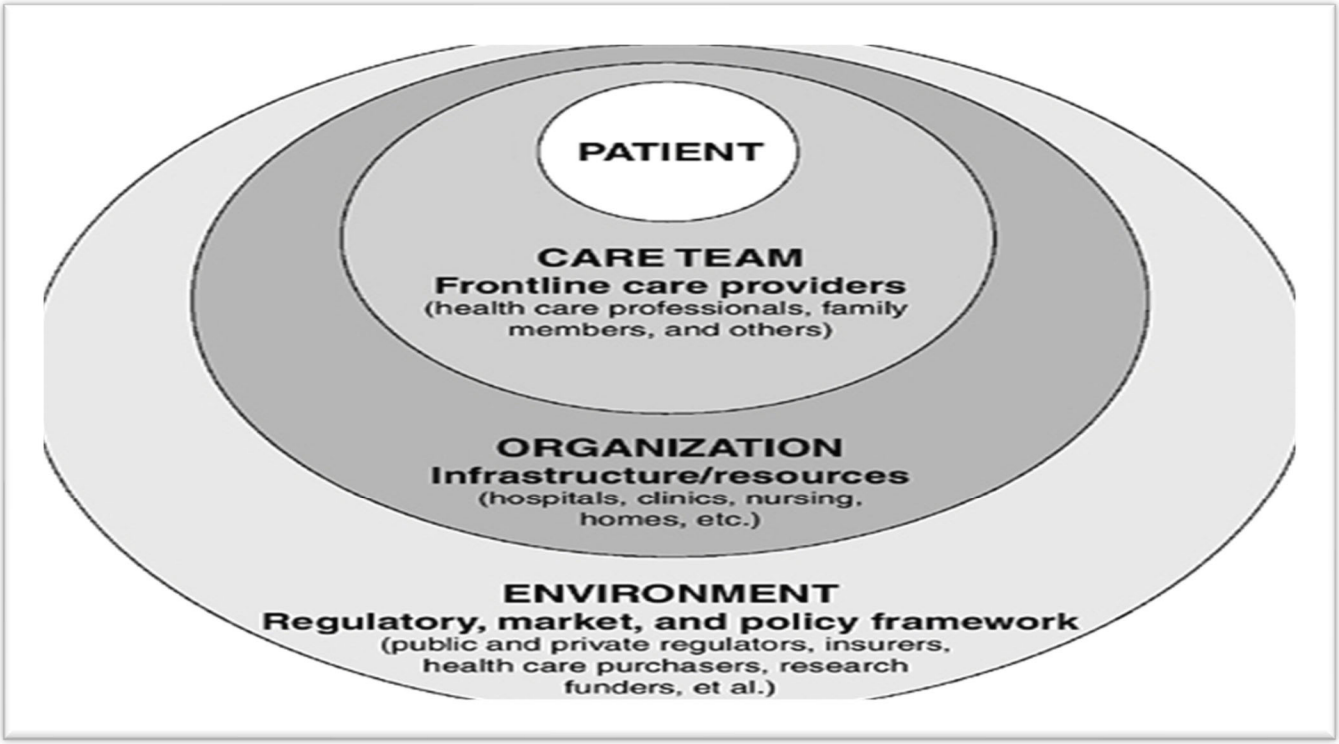


Figure 4: Reid, Compton & Grossman's Four-Level Healthcare System Model

The patient is at the center of healthcare delivery within the Endoscopy Suite framework and operates closely with care teams composed of technicians, nurses, physicians, anesthesiologists, family, and other health care professionals. (Compton, Fanjiang, Grossman, & Reid, 2005). However, the care team must work within the organization's medical facilities. The organization must work under the healthcare environment's constraints (Compton, Fanjiang, Grossman, & Reid, 2005).

It is wise to recognize deficiencies at all four healthcare model levels when evaluating colonoscopy cancellations since, theoretically, at each level, the solution and strategies to fix or minimize deficiencies will vary. Environmental issues can include policy and regulatory changes. Health insurance regulations, which mandate tests to be completed within specific timeframes, would be examples. Another example would be a regulatory policy that mandates that designated care team members are present before the procedure gets underway, such as "time out." The organization's concerns will also be classified as problems with processes such as block time utilization and supply change management. Lack of staffing, union disputes, weak interpersonal relationships, and insufficient coordination can involve concerns emerging from the care team.

Since the patient is at the center of the conceptual framework, it is essential to define the patient cancellation reasons. This report will explore patient factors, including patient demographics, type of insurance, marital status, and race. If all these causes coincide with cancellations, it will motivate the care team, organization, and environment to preemptively resolve these issues before addressing the other three levels (Compton, Fanjiang, Grossman, & Reid, 2005).

2 CHAPTER II SCOPING LITERATURE REVIEW

2.1 Background

Research suggests that compliance with colorectal screening could substantially reduce the risk of mortality associated with CRC in persons aged 50 to 75 years (Dougherty et al., 2018). However, many factors undermine the efficacy of CRC, including low compliance rates, the lack of availability, and the high costs of the test (Issa & Noureddine, 2017). Several studies focused on their endoscopic suites and either proposed or completed a quality improvement initiative within their organization to improve compliance. One study reported greater compliance from patients scheduled for polyp monitoring versus patients scheduled for an initial test (Greenspan et al., 2015).

2.2 Colorectal Screening Modalities

CDC (2020) reveals that in only 68% of eligible patients nationwide, testing is up-to-date and that the rates between the minority races and the under-insured are consistently lower. Researchers (Dougherty et al., 2018; Issa & Noureddine, 2017) suggest giving patients a choice of the various options to achieve the highest degree of compliance with CRC screening. However, colonoscopy is considered the gold standard for screening and preventing CRC (Issa & Noureddine, 2017; Wagner, Jessica, & C, 2019). Researchers cited several CRC screening options below (Dougherty, et al., 2018):

1. Flexible sigmoidoscopy - For this test, the physician places a short, thin, flexible, illuminated tube inside the rectum—the physician scans for polyps or cancer within the rectum and the lower third of the colon. The recommended frequency is every five years, or every ten years, with a FIT every year.

2. Colonoscopy - is like flexible sigmoidoscopy, but with the use of a bigger, thin, flexible, light tube, the physician tests for polyps or cancer inside the rectal and entire colon. During the test, the physician can identify and remove most polyps and certain cancers. As a follow-up check, colonoscopy is also used to detect anything unusual during one of the other screening tests. The recommended frequency is every ten years (for individuals who are not at elevated risk of developing colorectal cancer).
3. CT colonography - also known as a virtual colonoscopy, uses X-rays and computers to generate colon photos projected on the physician's computer screen for analysis. The recommended frequency is every five years.
4. Stool gFOBT- uses the chemical guaiac to track blood in the stool. Patients receive a test kit from their health care provider. The patient will return the kit to the doctor or a laboratory to test stool samples for blood. The recommended frequency is once per year.
5. Stool FIT - The Fecal Immunochemical Test (FIT) uses antibodies to detect blood in the stool. The recommended frequency is once per year.
6. Stool MT-sDNA, Cologuard – Detects altered DNA in the stool. Patients collect an entire bowel movement for this test and send it to the lab to test for cancer cells. The recommended frequency is once every three years.

2.3 Definition and Effects of Cancellations

Colonoscopy cancellation is characterized as a scheduled procedure in which physicians and other resources are committed to patients who then fail to keep their appointment for various reasons (Greenspan et al., 2015; Wagner, Burgess, & Britt, 2019). Colonoscopy cancellations have been highlighted as a significant contributor to non-compliance with CRC screening (Greenspan et al., 2015).

In an ambulatory care environment, providers can add patients in a cancellation and no-show slot at the last minute. However, in the field of gastroenterology, cancellation in endoscopy suites is especially troublesome due to procedures involving preparation on behalf of the patient, who must be accompanied by an escort that presents the service from adding a last-minute appointment. Cancellations result in unproductive use of resources, increased costs, longer wait times, and delays in diagnosing colorectal cancer (Bhise et al., 2016; Partin, Gravely, Gellad, Nugent, & Burgess Jr, 2016).

2.4 Colonoscopy Cancellation Factors

Research indicates several factors cause cancellations. Social determinants tended to be a differentiating factor in demographics found in patients who had missed a colonoscopy appointment. They appear non-white, have a history of substance use, and uninsured (Wagner, Burgess, & Britt, 2019). Previous studies have found that bowel preparation issues accounted for almost twenty-four % of cancellations and contributed to the short-term recurrence of colonoscopies, increased risk of complications, longer care durations, and increased missing lesions (Restall et al., 2018; Wagner, Burgess, & Britt, 2019). Research shows most missed colonoscopy appointments are due to a lack of transportation or absence of an escort to care for the patient postoperatively and highlights the socioeconomic status implications (Deng et al., 2015; Wagner, Burgess, & Britt, 2019). No-shows also represent a significant cancellation reason and vary significantly from 3-80% depending on the health system or clinic setting (Bhise et al., 2016; Wagner, Burgess, & Britt, 2019). Restall et al. (2018) show insufficient patient understanding of why they need a colonoscopy plays a significant role in cancellations.

2.5 Measures of Endoscopy Efficiency

The Donabedian model is a conceptual model used to assess health care and health facilities quality (Ayanian & Markel, 2016) s. According to the model, information about the quality of care can be obtained from three groups: structure, process, and outcomes (Ayanian & Markel, 2016).

The Endoscopy Suite has many measures other than cancellations that assess efficiency. Outcome metrics can include the number of cases a day or the number of procedures performed per room in a day (Gellad, Thompson, & Taheri, 2013).

Process improvement measurements measure how well a system, given a collection of tools, is doing. Room turnaround time, prep time, sedation time, treatment time, and recovery time are examples of workflow metrics in endoscopy. Several studies have proposed that the crucial mechanism, or the limiting process element, is room turnover in endoscopy. Modeling simulations have shown that shortening room turnaround time can substantially affect throughput, showing how process measures will influence the result (Gellad, Thompson, & Taheri, 2013).

Structural measures are the most actionable indicators. The number of treatment rooms; the number of staff, doctors, or nurses; the unit layout; and the number of endoscopes are examples of structural steps. Often, procedures may wrongly look at a metric of the outcome, such as throughput, and conclude that it is not good because there are not enough staff, surgeons, or even endoscopes, resulting in increased unnecessary costs. Physicians believe that they could boost their performance if they only had more money. Improvement in the endoscopy suite's total efficiencies leads to an increased number of screenings (Gellad, Thompson, & Taheri, 2013).

2.6 Colonoscopy Cancellation as a Measure of Healthcare Costs

Research shows that cancellations can have a substantial financial impact on both patients and hospital operations (Gellad, Thompson, & Taheri, 2013). A lower cancellation rate means time and financial savings (Deng et al., 2015). A reduced cancellation rate will lead to improved use of hospital services from a health care provider's point of view (Deng et al., 2015). One study indicated cancellations are costly and result in a net loss measured at $725.00 per day in an Endoscopy suite (Partin et al., 2016).

2.7 Colonoscopy Cancellation as a Measure of Patient Outcomes

Missed appointments are frequently the source of significant delays for those with future appointments. Furthermore, those absentee time slots prevent potential colonoscopy patients from receiving treatment (Wagner, Burgess, & Britt, 2019). A rise in wait times for diagnostic colonoscopy as brief as 30 days is associated with a small but substantially improved likelihood of finding neoplasia during the test (Partin et al., 2016). For most endoscopy suites, recognizing and minimizing the impact of modifiable drivers of canceled colonoscopy appointments is a high priority (Partin et al., 2016).

2.8 Patient Navigation (PN) as an Intervention to Increase Colorectal Cancer Screenings

Research indicates that the most effective CRC screening compliance programs, particularly in underserved communities, use patient navigators (Ajeesh & Luis, 2017; Dougherty et al., 2018; Issa & Noureddine, 2017). The CDC PN programs include the following series of protocols that include 1) inviting the patient to consent to conduct a colonoscopy, 2) updating procedures for bowel preparation and instructions for how and when to receive bowel preparation, 3) overcoming hurdles, 4) checking arrangements for transport and patient escort (5-

7 days before a colonoscopy), 5) comprehensively reviewing bowel preparation instructions, 6) verifying the details of the appointment, 7) analyzing the colonoscopy process and providing any assistance required; and 8) verifying the acceptance and understanding of the results of the patient and the prescribed rescreening time from the endoscopist (Rice et al., 2017). Researchers suggest that successful PN services require direct patient participation, contact and do not advocate using text messaging (Ajeesh & Luis, 2017; Rice et al., 2017).

Some studies show a nurse administered PN model that incorporates counseling about colonoscopy preparation, reminding patients of their appointment, and educating patients about the importance of screening colonoscopy are incredibly effective (Kalayjian et al., 2015; Rice et al., 2017). In contrast, non-nurse PN was also effective and less costly (Rice et al., 2017).

Several studies (Kim et al., 2018; Rice et al., 2017) report the average number of completed colonoscopies recorded improved by almost 11 %age points compared with patients who did not undergo PN. Dougherty et al. (2018) indicate a PN program will increase screening rates by approximately 20 %. Additionally, if PN interventions involved external elements such as video aids and automated alerts rather than conventional instructional mailings or navigator reminder calls, the combined interventions were associated with larger screening increases (Dougherty et al., 2018). PN is a vital intervention in order to increase colorectal screening (Kim et al., 2018).

2.9 Technology as an Intervention to Increase Colorectal Cancer Screenings

Research indicates that the use of technology has grown exponentially over the last 13 years, making it practical and realistic to introduce initiatives that use information technology as a core function. (Ajeesh & Luis, 2017). In particular, the EHR-based patient navigation module detects gaps in care and strategies for clinicians to achieve cancer screening targets for their

patients better. (Ajeesh & Luis, 2017). CRC's educational website includes structured colonoscopy preparation models, modifiable risk factors for CRC, and connections to programs that help make patient education more successful (Ajeesh & Luis, 2017).

Traditionally, Endoscopy clinics provided medical brochures well in advance of the procedure, with easy-to-understand detail on treatments, benefits and risks, and consent (Deng et al., 2015; Restall et al., 2018). High-quality teaching materials will give patients more time to think about colonoscopy recommendations making it simpler and more consistent to receive informed consent (Restall et al., 2018). Telephone video and email notification are various alternatives to traditional brochures. However, these alternatives are costly or require a more significant educational background (Deng et al., 2015).

Short Message Service (SMS) is another intervention used to reduce cancellations and improve outpatient CRC screening compliance (Deng et al., 2015). Using SMS to improve the compliance of outpatients for preprocedural instructions is a new phenomenon. It is a cost-saving, cost-effective, and time-efficient method to increase patient compliance because it can be automated (Deng et al., 2015). Current research related to SMS usage focuses mainly on managing chronic conditions such as HIV, smoking cessation, hypertension, diabetes, and reminding patients of their appointment dates and times (Deng et al., 2015). However, as noted earlier, PN programs did not recommend using text messages (Ajeesh & Luis, 2017; Rice et al., 2017).

2.10 Challenges in the literature

In recent years, the advent of the EHR has had an essential effect on healthcare operations, particularly in the surgical setting. It increases data processing, organizing, and operational processes, but it is not without drawbacks. It is essential to provide improved

protection and data protection for the effectiveness of projects leveraging technology (Deng et al., 2015).

Research has demonstrated a significant success when combining interventions, resulting in increased CRC screening (Dougherty et al., 2018). A performance improvement project assessment by Foglia, Adler, and Ruiz (2013) revealed how the introduction of the EHR would enhance endoscopy quality in tandem with other performance improvement measures such as staff education and preoperative clinics. There was a 35% rise in the number of cases and a 53% increase in revenue. The authors contributed the progress to the EHR's capacity to streamline scheduling. Many studies used a single center or site model, lending uncertainty about its generalizability to other settings (Greenspan et al., 2015).

2.11 Conclusion

Many colorectal screening compliance studies to date vary from retrospective research and quality improvement programs using the EHR as the primary data source. Due to the challenges of using EHR data and the variability in definitions and dynamics between sites, the comparison of studies and the attempt to understand the subtleties of non-compliance are at best challenging. There is strong evidence that combinations of interventions targeted at patients and physicians have specifically been shown to improve colorectal cancer screening rates (CRC). However, colorectal screening compliance is a consistent challenge, regardless of the source, which has a dynamic system of mitigating factors, including hospital, suppliers, and patient concerns. There are undoubtedly several opportunities for researchers to understand this phenomenon better and find strategies that increase commitment to colorectal screening, especially concerning the patient navigator's function. However, healthcare organizations have a

more significant opportunity to implement evidence-based strategies to achieve the national goal of 80% in every community.

3 Chapter III Methodology

This consultative report aims to recommend interventions to increase colorectal screening compliance and decrease colorectal screening cancellations. Additionally, this report identified patient demographics most associated with colonoscopy screening cancellations and significant factors associated with colonoscopy screening cancellations.

3.1 Design and Setting

The research site occurred at Provident Hospital in Cook County, the largest County in Illinois. Cook County represents 1/3 of the colorectal cases in Illinois. Provident Hospital's mission includes treating all patients regardless of their ability to pay. In 2019, the patient population included 87.4% African American, 8.03% White, 0.77% Asian, and 3.8% two or more races. Our age grouping indicates 58% of our patient population is over 50 years of age. Our current payor mix includes 42.51% Medicaid, 11.49% Medicare, 6.22% Other, and 33.04% are uninsured. Only 6.74% of our patients are commercially insured. The report is a descriptive, retrospective consultative report.

3.2. Data Collection

Cook County Health's Business Intelligence department analyzes data and develops past, present, and predictive views of business operations using techniques and tools. The hospital uses Cerner information solutions for its EHR (Cerner, North Kansas City, MO). The use of pre-collected data from the EHR is an efficient and simple way to research patients at this community hospital.

Scheduled colonoscopy procedures were reviewed from the EHR from January 2018 through December 2019. Colonoscopy cancellation was defined as those scheduled for an Endoscopy appointment but canceled on the same day or within 24 hours of their procedure.

All data elements were deidentified. Cook County Health Business Intelligence team gathered demographic data, including gender, race/ethnicity, type of insurance, marital status, and age, to examine and discuss the report's first goal: to classify any patient-specific demographics most associated with endoscopy cancellations. Next, discuss the second goal of the analysis and any other important factors associated with colonoscopy screening cancellations.

3.4 Population

The study population is approximately 10,000 unique patients between the ages of 50-75 who are eligible for colorectal cancer screening. As well as patients who were scheduled for a colonoscopy procedure at Provident hospital from January 2018 through December 2019. The consultant report will discuss developing a program to achieve 80% colorectal screening for Provident Hospital patient population within three years and interventions to decrease colonoscopy cancellations.

3.5 Analysis

Cook County Health data analyst used Business Intelligence resources to abstract all data such as the total number of procedures, number of cancellations, and reason for cancellations collected from the Cerner EHR. After the data was analyzed using Excel Data Analytics, interventions were recommended using a four-level health system model illustrating the role of individual patient, care team, organization, and the environment to establish a Colon Cancer Prevention Program.

4 CHAPTER IV RESULTS

4.1 Colorectal Screening Analysis

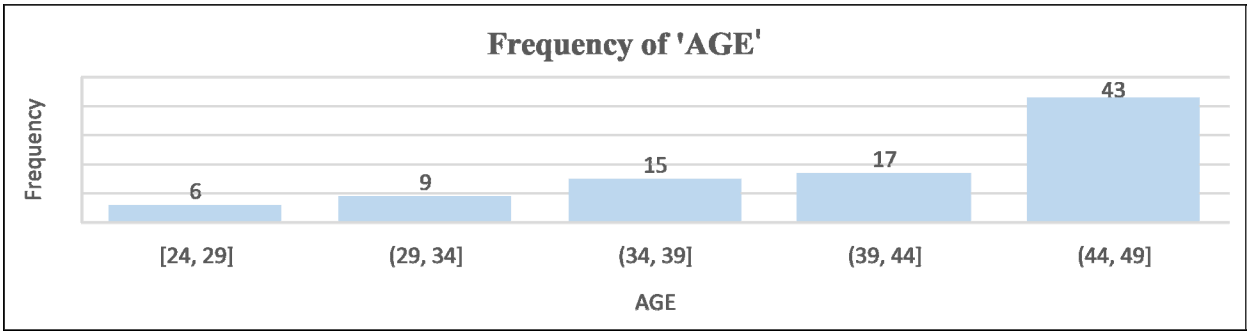
CCH Business Intelligence team identified 10,098 eligible colorectal screening patients having at least 1 visit within the last 3 years (Table 1). The age range is currently 50-75. Completed screenings occurred in 67% of patients. Provident hospital's goal is to reach 80% of its population within 3 years.

Table 1: Absolute and relative number of unique patients that have not received colorectal cancer screening, Provident Hospital.

Colorectal Screening - Age Range 50-75	n	%
Total Unique Patients	10,098	43%
Completed Screening	6,800	67%
Have not completed screening	3,298	33%
Goal - 80% completed screening within 3 years	8,078	80%

Although the Cook County Health age range for screening for CRC is 50-75 years old, the system is currently evaluating decreasing the age range to 45 based on the American Cancer Society's recommendations. Figure 5 reflects 90 completed colonoscopies (11%) were under the age of 50 from January 2018 through December 2019.

Figure 5: Frequency of AGE



Reference: (Cerner Analytics, 2021)

4.2 Completed/Canceled/No-Show Analysis

Out of the 1,974 (100%) elective colonoscopy procedures scheduled in 2018 and 2019 in Provident hospital, 833 (43%) were performed (Table 2). The data reflected 186 (10%) same-day cancellations, 470 (24%) cancellations within 24 hours, and 458 no-shows (23%). When a procedure is canceled for any reason, efficiency is jeopardized, waiting times increase, patient care may be jeopardized, resources are wasted, and costs increase.

Table 2: Absolute and relative number of scheduled elective procedures, completed, canceled, and no-showed, Provident Hospital, 2018-2019

Elective procedures	n	%
Completed	833	42.8%
Canceled (Same-Day)	186	9.6%
Canceled (Within 24-hours)	470	24.1%
No Show	458	23.5%
Scheduled	1,947	100%

4.3 Cancellation Reasons

Cancellations occurred in 656 (33.7%) procedures (Table 3). The cancellation reasons are not grouped into patient-related, surgeon-related, work-up-related, and administrative-related categories. Out of the 656 cancellations, the most common reason for cancellations was appointment modifications 412 (62.8%). "No cancel reason documented "75 (11.4%) was another common category for cancellations followed by patient refusal 34 (5.2%), patient request 33 (5.0%), and double-booked patient-related 18 (2.7%). This analysis reflects inappropriate utilization of cancellation reasons codes in the Cerner EHR.

Table 3: Absolute and relative number of elective colonoscopy cancellations on the same day and within 24 hours, reasons for cancellations characterized by Provident Hospital, 2018-2019

Cancellation Reasons	n	%
Appointment Modification	412	62.8%
No Cancel Reason Documented	75	11.4%
Patient Refusal	34	5.2%
Patient Request	33	5.0%
Double Booked	18	2.7%
Cancel/Rescheduled	14	2.1%
Order Modification	12	1.8%
No Show	12	1.83%
No Reason Provided	5	0.76%
Patient Needs More Work Up Incomplete	5	0.76%
Patient Medical Status Change	5	0.76%
OR - Surgery No Longer Needed	4	0.61%
Procedure No Longer Indicated	3	0.46%
Physician Request	3	0.46%
Scheduled In Error	3	0.46%
Missing/Unknown	3	0.46%
Patient Needs More Workup	2	0.30%
Auto Canceled	2	0.30%
OR - No show	2	0.30%
Resource Unavailable	1	0.15%
Auto No Show	1	0.15%
OR - Incomplete PreOp Process	1	0.15%
Administrative Error	1	0.15%
Patient Deceased	1	0.15%
OR - Surgeon Request	1	0.15%
OR - Financial Reasons	1	0.15%
Anesthesia Canceled	1	0.15%
Person Deceased In Error	1	0.15%
Total	**656**	**100%**

4.4 Descriptive Analysis

Between January 2018 and December 2019, a total of 1,947 colonoscopies were scheduled (Table 4). For completed, canceled, and no-show categories, the median patient age was 59 years old. Females scheduled and completion rates were marginally higher than males (50.8% vs. 29.2%) and (43.1% vs. 42.4%), respectively. Males had a greater rate of cancellation than females (34.5% vs. 32.9%). On the other hand, females had a higher percentage of no-shows than males (23.9% vs. 23.1%).

While the African American race accounts for 87.6% of the scheduled population, the White and Multiple Race groups have the highest colonoscopy completion rates (53.8% and 53.3%), the lowest cancellation rate (30% and 33%), and the lowest no-show rate (16.3% and 13.3%).

Most of the population is single (62.5%). Domestic partners and married individuals have a higher degree of completion rates (75.0% and 48.7%). The single and widowed population regularly cancel (35.3% and 32.7%). No-show percentages for married and separated people are the lowest (19.6 and 19.7).

Due to the high number of cancellations and no-shows, a significant proportion of the planned population's insurance remains unknown. Patients with Commercial, Medicaid, and Medicare Advantage insurance have the highest percentage of colonoscopy completion rates.

Table 4: Absolute and relative descriptive demographic information, Provident Hospital, 2018-2019

Demographic Factors	Total n=1947	%	Completed n=833	%	Canceled n=656	%	No-Show n=458	%
Average Age (Years)	59		59		59		59	
Gender								
Male	957	49.2%	406	42.4%	330	34.5%	221	23.1%
Female	990	50.8%	427	43.1%	326	32.9%	237	23.9%
Race								
African American/Black	1706	87.6%	713	41.8%	582	34.1%	411	24.1%
White	160	8.2%	86	53.8%	48	30.0%	26	16.3%
American Indian	7	0.4%	3	42.9%	0	0.0%	4	57.1%
Asian	27	1.4%	12	44.4%	10	37.0%	5	18.5%
Multiple	15	0.8%	8	53.3%	5	33.3%	2	13.3%
Other/UTD	24	1.2%	7	29.2%	9	37.5%	8	33.3%
Null	8	0.4%	4	50.0%	2	25.0%	2	25.0%
Marital Status								
Married	316	16.2%	154	48.7%	100	31.6%	62	19.6%
Single	1216	62.5%	489	40.2%	429	35.3%	298	24.5%
Divorced	157	8.1%	72	45.9%	44	28.0%	41	26.1%
Widowed	113	5.8%	47	41.6%	37	32.7%	29	25.7%
Domestic Partner	4	0.2%	3	75.0%	1	25.0%	0	0.0%
Separated	132	6.8%	64	48.5%	42	31.8%	26	19.7%
Null	9	0.5%	4	44.4%	3	33.3%	2	22.2%
Payor								
Commercial Insurance	58	3.0%	47	81.0%	11	19.0%	0	0.0%
Medicaid	40	2.1%	32	80.0%	7	17.5%	1	2.5%
Medicaid/Managed Care	385	19.8%	301	78.2%	78	20.3%	6	1.6%
Medicare	179	9.2%	138	77.1%	39	21.8%	2	1.1%
Medicare /Managed Care	87	4.5%	69	79.3%	17	19.5%	1	1.1%
Uninsured	257	13.2%	199	77.4%	54	21.0%	4	1.6%
Other/Unknown	941	48.3%	47	5.0%	450	47.8%	444	47.2%

4.5 Capacity Analysis

It is critical to ensure that Provident has the adequate capacity when planning for increased colorectal cancer screening exams. As Provident's demand increases, the team will be expected to monitor capacity (see table 5). When demand exceeds capacity, Provident will add additional resources.

Table 5: Absolute and relative capacity information, Provident Hospital, 2018-2019

Type of Procedure	Turnaround Time	Capacity Per Room	Year 1 1 Procedure Room	Year 2 2 Procedure Rooms	Year 3 3 Procedure Rooms
Colonoscopy Flexible sigmoidoscopy	45 minutes	9	27 - per week 108- per month 1,296 -per year	54 - per week 216 -per month 2,592 -per year	81- per week 324- per month 3,888- per year

Assumptions:

- 9 procedures per room - 7 hours day/420 minutes per room
- 1 room available, 3-day work week in year 2021
- 2 rooms available, 3-day work week in year 2022
- 3 rooms available, 3-day work week in year 2023
- Physicians/Anesthesiology/Nursing Staffing is Adequate

5 CHAPTER V DISCUSSION

5.1 Overview

Cook County Health Boards of Directors have voted to invest $2 million to develop a Colonoscopy Program to improve colorectal cancer screening at Provident hospital. The goal is to reach and exceed 80% colorectal cancer initial screening rate for patients seeing a Provident MD in 3 years. Based on the data review and the current screening rate of about 67%, 33.7% cancellation rate, 23.5% no-show rate, several interventions are recommended for the Provident leadership team.

5.2 Staffing Model

Assessment – Staffing levels must be adequate to ensure safe, high-quality care for patients during the pre-procedure, procedure, and post-procedure phases of care. Currently, the staff is shared with other departments and services within the hospital. The registration clerks provide coverage in the Emergency Department and inpatient unit. In addition, the nurses are floating between pre-op and recovery as well as providing services to several other services such as General Surgery, Ophthalmology, Urology, Podiatry, ENT, Obstetrics/Gynecology, Oral Maxillo-Facial, Plastics, and Colorectal Surgery.

Recommendation: Utilize the $2 Million funding from the board to create a separate endoscopy staffing model (See Table 6). The program director will oversee hiring the remaining personnel and developing a Patient Navigation program. Patient Navigators are critical components of any colonoscopy navigator program.

Navigators will assist colonoscopy patients in navigating the healthcare system and obtaining necessary resources and services. Provident leadership will hire Navigators that are

culturally competent health care workers who assist patients in overcoming barriers to quality care.

When a patient is referred for a colonoscopy by their doctor, the navigator will be expected to:

1. Assist in explaining why the procedure is necessary and how to prepare for it.
2. Help to alleviate the patient's anxiety about the procedure by explaining what to expect and answer questions.
3. Connect patients with resources and services.
4. Confirm or reschedule appointments.
5. Assist patients in making follow-up appointments.
6. Assist patients who are having difficulty adhering to treatment.
7. Monitor interventions and outcomes.
8. Perform outreach to patients that are due for a colorectal screening exam.

Table 6: Staffing Model

Staffing Model	FTE	Salary	Benefit Costs	Total Costs
Program Director	1	$100,000	$33,300	$133,000
Patient Navigator	2	$200,000	$66,000	$266,600
OR Nurse	1	$100,000	$33,000	$133,000
Same-Day Surgery Nurse	1	$100,000	$33,000	$133,000
Recovery Nurse	1	$100,000	$33,000	$133,000
Endoscopy Tech	1	$60,000	$19,800	$79,800
Business Manager	1	$75,000	$24,750	$99,750
Totals	**8**			**$977,550**

5.3 Colorectal Screening Rate Tracking Dashboard

Assessment- Cerner provides a comprehensive suite of analytic solutions that enable organizations to make data-driven decisions and perform advanced analysis tailored to their organization's specific needs and goals, leveraging aggregated and normalized data across the community to identify and monitor opportunities for improvement. Provident hospital's baseline CRC screening rate is 67%. Physicians and support staff are using the Cerner functionality that notifies health care providers when it is time for a patient's CRC screening exam (referred to as a "reminder") or when the person is late for screening (referred to as a "recall").

Recommendation - Utilize new technologies, streamline processes, and constantly monitor progress to ensure that patients do not fall through the cracks in the colorectal cancer screening pathway. Provident should create an electronic dashboard to track colorectal cancer screening rates throughout our health system, allowing the team to identify gaps in care and track progress.

5.4 Cancellation/No-Show

Assessment - The data analysis reflects several deficiencies related to data input. A reason for the cancellation must be entered for all patients that cancel their appointment. There are currently 28 cancellation reasons and several duplicate messages. For example, there are 3 no-show reasons:

1. no-show
2. operating room (OR) no show
3. auto no-show

In addition, there are multiple fields used if the staff does not know the reason for the cancellation:

1. appointment modification

2. no cancel reason documented.

3. no reason provided.

As well as multiple fields for patient work-up:

1. patient needs more work-up – incomplete.

2. patient needs more work-up.

Recommendation – revise the current cancellation list and create a new list using the four-level healthcare system model - the individual patient, the institution, the treatment team, and the environment. See Table 7. If a patient is a no-show, the system should automatically select no-show within 24 hours if a cancellation reason is not entered.

Table 7: Cancellation Reasons

Patient Factors
No COVID Test
Did not follow pre-op instructions
No Reason Provided
Medical Condition
Patient Refused Procedure
Patient Death
No Escort
Care Team (physicians, nurses) Factors
Surgeon late – unavailable
Anesthesiology late – unavailable
Patient requires additional work-up
Organization/ Infrastructure Factors
No availability of equipment /malfunctioned equipment
Delayed lab test
Scheduling Error
OR Behind Schedule
Environmental Factors
Insurance Concerns
No Preauthorization/Financial Clearance

5.6 Limitations

This consultative report's limitations were related to the use of secondary data extracted from Cook County Health. Cerner's cancellation list had multiple duplicates and several options to avoid providing a specific reason for cancellation.

This fact can be observed through the data: 62.8% of the cancellation reasons were for appointment modifications—which cannot be accurately interpreted. A reconstruction of the cancellation reasons data fields will allow the reasons for cancellations to provide effective quality assurance.

5.7 Conclusion

In summary, this report demonstrates to maximize the benefit of CRC screening, a programmatic approach to implementing screening strategies is required. The screening program's quality should be measured by its ability to identify patients who are due for screening, provide access to screening, and assess screening adherence. Accurate documentation related to cancellation reasons, cancellation rates, and no-show rates is essential to reflect baseline data and progress. Same-day cancellations, cancellation within 24 hours, no-shows, and infrastructure is a significant problem at Provident Hospital. Identifying and addressing these issues will improve the efficiency of the endoscopy unit and improve the overall colorectal screening rate. Consultant reports are generated based on research, assessment, recommendations, and execution. This report provides strong recommendations, the next step is execution.

References

Ajeesh, S., & Luis, R. (2017). A Comprehensive Electronic Health Record Based Patient Navigation Module Including Technology-Driven Colorectal Cancer Outreach and Education. *American Association for Cancer Education*, 627-633.

Ayanian, J. Z., & Markel, H. (2016). Donabedian's Lasting Framework for Health Care Quality. *New England Journal of Medicine*, 205-207.

Battaglino, B. (2018, May 9). Retrieved from Healthy Women: https://www.healthywomen.org/content/blog-entry/importance-early-detection-colorectal-cancer

Bhise, V., Modi, V., Kalavar, A., Espadas, D., Hanser, L., Gould, M., . . . Singh, H. (2016). Patient-Reported Attributions for Missed Colonoscopy. *Digestive Diseases and Sciences Journal*, 1853-1861.

Brenner, H., Stock, C., & Hoffmeister, M. (2014). Effect of screening sigmoidoscopy and screening colonoscopy on colorectal cancer incidence and mortality: systematic review and meta-analysis of randomised controlled trials and observational studies. *BMJ*.

CDC. (2020, June 8). *Colorectal Cancer Statistics.* Retrieved from Centers for Disease Control and Prevention: https://www.cdc.gov/cancer/colorectal/statistics/

Compton, W. D., Fanjiang, G., Grossman, J. H., & P., P. (2005). *Building a Better Delivery System: A New Engineering/Health Care Partnership.* Washington D.C.: The National Academies Press.

Compton, W. D., Fanjiang, G., Grossman, J. H., & Reid, P. P. (2005). *Building a better delivery system : a new engineering/health care partnership.* Washington D.C.: National Academies Press.

Deng, X., Wang, Y., Zhu, T., Zhang, W., Yin, Y., & Ye, L. (2015). Short Message Service (SMS) can ENhance Compliance and Reduce Cancellations in a Sedation Gastrointestinal Endoscopy Center: A Prospective Randomized Controlled Trial. *Journal of Medical Systems*, 1-11.

Dougherty, M. K., Brenner, A. T., Crockett, S. D., Gupta, S., Wheeler, S. B., Coker-Schwimmer, M., . . . Reuland, D. S. (2018). Evaluation of Interventions Intended to Increase Colorectal Cancer Screening Rates in the United States. *JAMA Internal Medicine*, 1645–1658.

Gellad, Z. F., Thompson, C. P., & Taheri, J. (2013). Endoscopy Unit Efficiency: Quality Redefined. *Gastroenterology & Hepatology*, 1046-1049.

Goss, K. (2018, May 18). *At the Forefront of UChicagoMedicine.* Retrieved from UChicago Medicine Web site: https://www.uchicagomedicine.org/forefront/cancer-articles/new-guidelines-lower-colorectal-screening-age-from-50-to-45

Greenspan, M., Chehl, N., Shawron, K., Barnes, L., Li, H., Avery, E., . . . Melson, J. (2015). Patient Non-adherence and Cancellations Are Higher for Screening Colonoscopy Compared with Surveillance Colonoscopy. *Digestive Diseases and Sciences*, 2930–2936.

Issa, I. A., & Noureddine, M. (2017). Colorectal Cancer Screening: An updated review of the available options. *World Journal of Gastroenterology*, 5086-5096.

Kalayjian, E., Bringman, D., Naughton, A., Bond, S., Sarver, W., & Mion, L. C. (2015). Improving Adherence to Screening Colonoscopy Preparation and Appointments. *Gastroenterology Nursing*, 408-416.

Kim, K. E., Randal, F., Johnson, M., Quinn, M., Maene, C., Hoover, S., . . . Subramanian, S. (2018). Economic Assessment of Patient Navigation to Colonoscopy-Based Colorectal

Cancer Screening in the Real-World Setting at the University of Chicago Medical Center. *Cancer*, 4137-4144.

Levin, B., Smith, R. A., Feldman, G. E., Colditz, G. A., Fletcher, R. H., Nadel, M., . . . Wender, R. (2002). Promoting early detection tests for colorectal carcinoma and adenomatous polyps. *Cancer*, 1618-1628.

Partin, M. R., Gravely, A., Gellad, Z. F., Nugent, S., & Burgess Jr, J. F. (2016). Factors Associated With Missed and Cancelled Colonoscopy. *Clinical Gastroenterology and Hepatology*, 259-267.

Restall, G., Walker, J. R., Waldman, C., Zawaly, K., Michaud, V., Moffat, D., & Singh, H. (2018). Perspectives of primary care providers and endoscopists about current practices, facilitators and barriers for preparation and follow-up of colonoscopy procedures: a qualitative study. *BMC Health Services Research*, 782-782.

Rice, K., Gressard, L., DeGroff, A., Gersten, J., Robie, J., Leadbetter, S., . . . Butterly, L. (2017). Increasing colonoscopy screening in disparate populations: Results from an evaluation of patient navigation in the New Hampshire Colorectal Cancer Screening Program. *Cancer*, 3356-3366.

Wagner, M. S., Burgess, J., & Britt, R. C. (2019). Barriers to Colonoscopy in an Uninsured Patient Population-A Quality Improvement Project. *Am Surg*, 111-114.