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Evaluating Colorectal Cancer Screening Rates in an Urban Primary Care Practice

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Abstract

Colorectal cancer accounts for 8% of all cancer deaths and can be prevented through timely removal of colon polyps. Despite recommendations for routine screening, approximately 31.2% of patients go unscreened for this disease (Centers for Disease Control and Prevention, 2018). The purpose of this project was to determine screening rates and documentation mechanisms for colorectal cancer in an urban primary care practice, to determine how many patients completed the screening, and to present findings to the practice providers along with exploring ways to increase screenings. An additional purpose of this project was to determine and identify patient demographics which can impact rates of screening. A retrospective chart review was conducted of patients aged 50 to 75 years old in an urban primary care clinic from January 1, 2019 to March 31, 2019. Charts were reviewed to determine if colorectal cancer screening was recommended and documented per screening guidelines and whether patients completed the screening. Overall rate of screening was 61%, which did not meet the national goal but was within the meaningful use measures. Of the 120 charts reviewed, 72 patients had completed colorectal cancer screening. There were no significant differences within demographic variables and provider screening rates. Results from the chart review were then presented via focus group to two providers from the clinic. Three strategies were discussed during the meeting: delegating a clinic support staff to identify scheduled patients who need screening, having the provider document when screening is due on the patient's problem list, and adding an alert on the patient "dashboard" to provide an immediate alert when screening is due. Race, gender, location of residence, and provider type did not yield statistical difference in screening rate. Future benefit may be seen by repeating the chart review now that the information has been presented to providers and specific strategies are being planned.

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Evaluating Colorectal Cancer Screening Rates in an Urban Primary Care Practice

Introduction and Background

Colorectal cancer is a significant health concern affecting approximately 4% of American adults each year (American Cancer Society, 2017). Unfortunately, despite available screening options for early detection and treatment, only 50 to 75% of eligible patients are screened (Triantafillidis, Vagianos, Gikas, Korontzi, & Papalois, 2017). Researchers have identified multiple barriers to colorectal cancer screening, including lack of resources, lack of education, cost, and negative past screening experiences (Wang et al., 2017). Without addressing ways to increase colorectal cancer screening rates, late diagnosis, death, and significant health expenses related to colorectal cancer will continue. The purpose of this DNP project was to determine screening rates and documentation mechanisms for colorectal cancer in an urban primary care practice and to facilitate a conversation with clinic providers on ways to increase screening rates.

Colorectal cancer is the irrepressible division of abnormal cells in the colon or rectum resulting in a malignant tumor, usually over a 10 to 20-year period (National Cancer Institute, 2016). From 2007 to 2013 in the United States, there were 40.1 new cases of colorectal cancer per 1,000 people (Centers for Disease Control and Prevention, 2017). Kentucky has one of the highest rates of colorectal cancer in the nation, with 49.4 per 1,000 new cases in 2014 (Kentucky Department of Public Health, 2016). In addition to high incidence rates, Kentucky also had one of the highest mortality rates from colorectal cancer from 2009 to 2014. During this time period the mortality rate of colorectal cancer for males in Kentucky was 20.3 to 23.7 per 100,000 people, and 13.0 to 14.2 per 100,000 for females. Despite these statistics, in 2014 Kentucky ranked 24th in the nation in screening rates. As of 2019, only 67.6% of people in Kentucky from ages 50 to 75 have undergone colorectal cancer screening (American Cancer Society, 2019).

The risk of colorectal cancer varies based on race and gender. Nationally, men are at greater risk for colorectal cancer than women, with risk increasing with age group (Centers for Disease Control and Prevention, 2017). In the mid 1980s the incidence of colorectal cancer was similar for both black and Caucasian patients. However, the incidence has gradually declined for the Caucasian population while remaining steady among African Americans causing African Americans to have the highest incidence of colorectal cancer in comparison to other ethnicities (Centers for Disease Control and Prevention, 2017). While the reason for this is not completely understood, access to care and genetic differences are thought to contribute to increased incidence of colorectal cancer in the African American population.

The cost of colorectal cancer screening varies depending on the strategy used to screen patients. In 2016 the average cost of a colonoscopy ranged from $2,300 to $5,100 while the cost of a FIT test ranged from $130.00 to $530.00. Although, completion of colorectal cancer screening does come at a cost, all recommended colorectal cancer screening strategies are less costly than the treatment of colorectal cancer (Patel & Kilgore, 2015). In 2010, an estimated $14 billion went to the direct costs of colorectal cancer care in the United States (Centers for Disease Control and Prevention, 2011). Moreover, the cost of inpatient treatment for colorectal cancer in the state of Kentucky increased from $80 million in 2006 to $110 million in 2012 (American Cancer Society, 2019).

MACRA

The Medicare Access and CHIP Reauthorization Act of 2015 (MACRA) is a legislative act which changes reimbursement for providers who care for Medicare beneficiaries (Department of Health and Human Services, 2019). This program was created to shift the focus of reimbursement to quality and value of care rather than volume. Under this act, providers are

reimbursed based on the quality and effectiveness of their care rather than the previous fee for service system. Providers earn more or less depending on their performance against these measures of quality and efficiency (Department of Health and Human Services, 2019).

Patient completion of a colorectal cancer screening test is one of the clinical quality measures established through MACRA. For this measure, provider reimbursement is based on the rate that patients complete colorectal cancer screening, not just if the screening test was ordered (Department of Health and Human Service, 2019). The rate is determined by dividing the number of patients who have completed colorectal cancer screening by the total number of eligible patients who were seen within the performance period. This measure is to be submitted to the Department of Health and Human Services at least once per 12-month performance period for patients seen during that time frame (Department of Health and Human Services, 2019).

Pledge to Screen

The National Colorectal Cancer Roundtable (NCCRT) created the "80% Pledge," a national initiative with the goal that 80% of all patients age 50 to 75 years of age are routinely screened for colorectal cancer (National Colorectal Cancer Roundtable, 2019). The original initiative was created in 2014 and set a four-year time span for achievement. In 2014, the national screening rate was 66.2%. While the goal was not achieved by 2018, over 1,500 organizations continue to work towards achievement of the target. Organizations from all 50 states, Puerto Rico and Guam have signed the pledge to work towards achieving this 80% goal (National Colorectal Cancer Roundtable, 2019).

The purpose of this project was to determine screening rates and documentation mechanisms for colorectal cancer in an urban primary care practice, to determine how many patients completed the screening, and to present findings to the practice providers along with exploring

ways to increase screenings. An additional purpose of this project was to determine and identify patient demographics which can impact rates of screening. Information would then be presented to providers in order increase their knowledge surrounding colorectal cancer and develop strategies to increase rates of colorectal cancer screening. The specific aims were to determine current rates of providers ordering colorectal cancer screening tests; determine rate of patients completing colorectal cancer screening tests; determine how colorectal cancer assessment is documented by providers in an urban primary care practice; determine rates of MACRA documentation compliance; and present findings from chart review to providers to enable a conversation about potential changes to increase rates of colorectal cancer screening.

Theoretical Model

The theoretical model guiding this project was Pender's Health Promotion Model (Pender, 2011). This model focuses on changing unhealthy behaviors to healthy behaviors. The model defines health as a "positive dynamic state" and not just the lack of disease. There are three areas of focus associated with the model: individual characteristics and experiences, behavior specific cognitions and affect, and behavioral outcomes. The model acknowledges health professionals as a component of the interpersonal environment along with families and friends (Pender, 2011). As part of this environment, health care professionals have the ability to influence the behavior of the patient and increase or decrease the likelihood of the patient taking part in health-promoting behavior. The idea that patients are more likely to complete health promoting activities when they receive support from others— along with positive reinforcement surrounding the positive health choice—reflects the focus areas in Pender's Health Promotion Model (Pender, 2011).

This model helps providers understand the completion of colorectal cancer screening as a health promotion behavior. This project focused on determining whether or not demographic

variables impact the likelihood of completing colorectal cancer screening. Demographic variables of patients including age, race and location of residence were evaluated to determine how rates of colorectal cancer screening in an urban primary care clinic vary among differing physiological and biological backgrounds (Pender, 2011). In addition, whether or not the provider, identified as an interpersonal influence, had recommended colorectal cancer screening to the patient was also reviewed.

Review of Literature

Screening Methods

Evidence shows that there are multiple ways to screen for colorectal cancer. Recommended screening methods include colonoscopy, Fecal Immunochemical Test (FIT), flexible sigmoidoscopy, CT Colonography, hemoccult sensa, and Fecal DNA (Centers for Disease Control and Prevention, 2019). The patient and provider should discuss these screening options along with patient risk and comorbidities to determine which test is most appropriate for the patient. There is varying degree of sensitivity and specificity for each of these tests (Centers for Disease Control and Prevention, 2019).

Colonoscopy is the preferred method for screening starting at age 50 for all average risk and high-risk patients (Centers for Disease Control and Prevention, 2019). It has a sensitivity of 95% and specificity of 86%. If the colonoscopy is normal, it should be repeated every ten years. This procedure allows for both detection and prevention, as it provides visualization of the entire colon and allows for removal of polyps or precancerous lesions during the procedure (Rex et al., 2017).

Stool testing is also available. The FIT test can be used in place of colonoscopy for detection of colorectal cancer. This test should be performed annually, and a positive result should be

followed by colonoscopy (Rex et al., 2017). FIT testing is the only non-invasive test to be considered a tier 1 screening test. The sensitivity of this is 73.8% and the specificity is 96.4% (Rex et al., 2017).

Flexible sigmoidoscopy, CT Colonography, and Fecal DNA testing are considered tier 2 tests (Rex et al., 2017). Flexible Sigmoidoscopy is a prevention test which should be performed every five to ten years and has a sensitivity of 95% and specificity of 87% (Rex et al., 2017). The CT Colonography, also referred to as a virtual colonoscopy, can only be used as a detection test and should be completed every five years. This has a sensitivity of 84% and a specificity of 88% (Rex et al., 2017). Fecal DNA testing is another detection test and should be completed every 3 years. It has a sensitivity of 92% and a specificity of 87% (Rex et al., 2017). Hemoccult sensa, which is a detection test, should be completed annually and has a sensitivity of 84% and specificity of 88% (Rex et al., 2017). A positive result on a test used for colorectal cancer detection should be followed by colonoscopy.

Screening Guidelines

Colorectal mortality can be decreased with recommended screening. Levin et al. (2018) have projected that by increasing the national rate of colorectal cancer screening to over 80%, the death rate associated with this type of cancer would drop to less than 19%. The United States Preventative Services Task Force (USPSTF) recommends screening for average risk individuals to begin at age 50 and continue until age 75 (Rex et al., 2017). For patients 75 to 85 years old, screening should be provided on a case by case basis while considering the current health status of the patient. For those over the age of 85 screening is no longer recommended (Rex et al., 2017).

Recommendations for screening vary according known to risk factors. Those with increased risk of developing colorectal cancer should be screened earlier and more frequently than patients of average risk (U.S. Preventative Services Task Force, 2017). Patients are considered high risk if they have a personal history of colorectal cancer, a history of adenomatous polyp (an advanced polyp is defined as an adenoma which is either 1 cm or larger, has high grade dysplasia, is an advanced serrated lesion or sessile serrated polyp with cytologic dysplasia), or inflammatory bowel disease.

There are other non-modifiable risks such as age, gender, race and family history which can increase the chance of developing colorectal cancer (American Cancer Society, 2017). While colorectal cancer can occur at any age, it is uncommon prior to the age of 40 and risk increases with age (Centers for Disease Control and Prevention, 2018). Regardless of race, colorectal cancer is more prevalent in males than females (Centers for Disease Control and Prevention, 2018).

In terms of race, the USPSTF recommends that screening for African Americans start at age 45 due to increased rates of colorectal cancer among the African American population (Bibbins-Domingo et al., 2016). Unfortunately, regardless of race, Medicaid does not provide reimbursement for colorectal cancer screening until age 50 (Rex et al., 2017). In the African American population most instances of colorectal cancer occur after the age of 60.

Having a family member who has had colorectal cancer or advanced adenomatous polyp or a family member with known genetic syndromes that cause colorectal cancer also increases risk for colorectal cancer (Rex et al., 2017). Patients should be screened starting at age 40 or 10 years younger than their earliest diagnosed family member if they have first degree relative with colon cancer or adenomatous polyps diagnosed before age 60 or two first degree relatives with colon

cancer or adenomatous polyp at any age. A first degree relative is considered parents, children, and siblings. Screening should be repeated in these patients every five years (Rex et al., 2017). People with a first-degree relative with colon cancer or adenomatous polyp diagnosed at 60 years of age or older or two second degree relatives, such as aunts, uncles and grandparents, with colorectal cancer should begin screening at age 40 and be advised to be screened as average risk persons (Rex et al., 2017).

There are modifiable risk factors as well. For example, maintaining healthy weight and regular physical activity can reduce the risk of type II diabetes which is associated with higher rates of colorectal cancer (American Cancer Society, 2017). Patients who regularly exercise, maintain a healthy weight and avoid moderate to heavy use of alcohol have a lower risk of developing colorectal cancer (American Cancer Society, 2017). Boyle et al. (2012) reported that being physically active can decrease the risk 25% (physically active was defined as recreational, household, or occupational physical activity). Obesity has also been identified as a risk for developing colon cancer. Obese men have a 50% higher risk of developing colon cancer and a 20% higher risk of developing rectal cancer. Obese women have a 20% higher risk of developing colon cancer and a 10% higher risk of developing rectal cancer than those of normal weight. Additionally, moderate to heavy use of alcohol can increase the risk of colorectal cancer by 20 to 40% compared to non-drinkers and occasional drinkers (Boyle et al., 2012).

Facilitators to Screening

The use of quality improvement activities can help to facilitate provider ordering and patient completion of colorectal cancer screening. A significant factor is the recommendation by a provider to the patient. In fact, patient and provider communication can increase screening rates by 20% (Knight et al., 2015). In addition, several mechanisms to facilitate colorectal cancer

screening and aid the provider in making an appropriate screening recommendation are associated with electronic medical records. Research has shown that implementation of an EMR alert system increases colorectal cancer screening rates (Guiriguet et al., 2016). Use of continuing medical education and implementation of a clinic facilitator to improve the ordering process for testing have also been found to increase screening rates (Weiner et al., 2017).

Researchers have also examined ways to increase rates of patient compliance to colorectal cancer screening. For example, live phone call reminders to encourage patients to complete the ordered screening and mail in options for screening have both been shown to increase patient compliance (Ylitalo et al., 2019). Allowing patients to complete fecal DNA testing in their homes eliminates the barrier of transportation, need for completion of bowel preparation, and fear of the procedure which have all previously been shown as barriers to screening (Ylitalo et al., 2019).

Barriers to Screening

Primary care providers have identified several barriers at the system level which impede the recommending and ordering of screening tests. Providers have found that there is a lack of screening resources and a lack of (or difficulty using) systems to identify patients appropriate for screening. They also reported a lack of support staff for follow up and lack of time to discuss screening and patient questions (American Cancer Society, 2017).

Patients have identified multiple barriers to completing colorectal cancer screening tests. Most often cited are cost associated with screening, negative screening experiences in the past, lack of education regarding the importance of completing screening tests, fear of cancer diagnosis, and lack of resources such as transportation (Knight et al., 2015). In Kentucky, patients reported in a 2008 survey that the main barrier to colorectal cancer screening was a belief that there was no

need to have this completed (Knight et al., 2015). Cost associated with colorectal cancer screening continues to be a barrier. Testing should be covered at no cost for patients with insurance. However, if a screening test yields abnormal results, this may result in further testing, biopsies, or polypectomy, and insurance may consider this follow up testing to be diagnostic rather than preventative screening. In this case the patient may be charged 20% of the insurance cost and/or a co-pay (American Cancer Society, 2019).

Methods

This project was completed at an urban primary care clinic in Lexington, Kentucky. The mission of the clinic is to provide "health care with compassion for Lexington's Northside and urban community" (UK Healthcare, 2020). The target population is the providers who work in the clinic and the patients who are seen there for whom colorectal cancer screening is indicated. This project is congruent with the mission of this clinic as improving provider knowledge increases quality of care provided. Stakeholders include clinic physicians, clinic nurse practitioners, the clinic manager, and patients and their families. Three of the providers are physicians while three of the providers are nurse practitioners.

Permission for this study was obtained through the University of Kentucky Institutional Review Board. A retrospective chart review was conducted assessing colorectal cancer provider screening rates of patients from January 1, 2019 to March 31, 2019. All data were de-identified using a crosswalk table. A study number was assigned to each patient and kept separate from the data. Inclusion criteria for this project included patients aged 50 to 75 years old who were seen in the primary care clinic during the selected time period. All charts of patients not meeting the criteria were excluded. A list of patients meeting these criteria were provided to the primary investigator from the clinic manager. From the list of 392 patients, 20 patients were

randomly selected from each of the 6 providers for a total of 120 patients. See Appendix 1 for the list of variables used in the chart review.

Cross sectional data were collected on each of the 120 subjects. Demographic data included patient age, gender, race, and place of residence. In order to analyze screening processes, charts were reviewed to determine whether or not screening was recommended by the provider, the incidence of patient completion of diagnostic screening, the method of diagnostic screening each patient completed, and completion of documentation required to meet MACRA compliance. Charts were also reviewed to determine if colorectal cancer screening had been recommended by the provider to patients who had not completed testing. If testing was recommended but not completed, charts were reviewed to determine if the reason this had not been completed was documented.

After data were collected, a study number was assigned to each patient that was cross walked to the results without any identifying data. The cross-walk table was kept separate from the results. The results were reported in aggregate form and kept on a password protected University of Kentucky computer where data will be stored for seven years. All electronic data files will be deleted according to the University of Kentucky's policy on destruction of electronic records.

Means and standard deviation were used to analyze demographic data. Rates of completion of colorectal cancer testing by gender, race and location were analyzed using Pearson’s chi-squared analysis to determine statistical significance. Provider screening rates were compared both individually and grouped by provider type. Pearson’s chi-squared analysis was used to determine difference in screening rates for individual provider and provider type. Data analysis was completed using SPSS Version 26 Analysis with an Alpha Value of 0.05 for all analyzed data.

A meeting was scheduled with the six primary care providers from the clinic. Two of the providers attended the meeting. The current ACG guidelines and recommendations for colorectal cancer screening were reviewed and barriers to screening completion were explored. Providers were presented with the findings from the chart audit and presented with their individual screening rates. Strategies to improve documentation of completed screening were discussed.

Results

Of the 120 charts reviewed, the majority were female (n=72, 60%). The age range was 50 to 74 years with a mean age of 58.9 years. The majority of the patients (n = 106, 88.3%) lived in Lexington. Ethnicity was equally distributed between Caucasian and Black patients (n = 58, 48.3%; n = 55, 45.83%). Only seven patients were identified as Hispanic.

Completed colorectal cancer screening was found in 61% of patients. Among male patients, 67% had completed colorectal cancer screening, compared with 57% of females. There were no significant differences between gender, race, and location of residency and colorectal cancer screening rates. Calculated p-values using Pearson's chi-squared were .285, .790 and .288, respectively.

Screening rates for colorectal cancer per provider were assessed and ranged from 45% to 75%. There were no statistical differences when comparing screening rates among providers (χ = p-value of .344). Charts were also evaluated to determine the rate at which colorectal screening completion was documented to meet MACRA compliance. Documentation of screening ranged from 35% to 60%. Screening rates showed that 65% patients who were seen by physicians had completed colorectal cancer screening, while 57% of patients who were seen by nurse practitioners were screened. The p-value was .350, which failed to show statistical difference in the two groups of screening rates.

Completion of colorectal cancer screening was documented in four different locations of the EMR. In order to meet MACRA compliance, documentation must be completed in a way to populate in the EMR Dashboard. This occurs when a colonoscopy is completed within the facility or if the provider manually documents completion of colorectal cancer screening. Of the 73 patients who completed colorectal cancer screening, completion of testing for 56 patients was documented within the results section of the EMR. However, 5 of these did not gain MACRA credit as two had colonoscopies completed at an outside facility and three had completed Cologuard and the provider did not manually document them in the EMR Dashboard.

Other places for documentation include the "History of Present Illness" and "Discussion" sections of the note along with the "Outside Documents" section of the EMR. Nine patients who had completed screening had this documented in the "History of Present Illness" section of the note. Of these nine patients, only two had then been manually entered to receive MACRA credit. Three patients had screening completion documented in the "Discussion" section of the note. One of these results had been manually entered into the EMR Dashboard by the provider. In addition, five patients had screening completed at outside facilities. These results were entered into the "Outside Documents" section of the EMR. Three of these were completed colonoscopies while the other two were Cologuard tests. Only two of the five had been manually entered into the EMR Dashboard, meaning the other three did not receive MACRA credit.

Colorectal cancer screening was not completed by 20 of the patients even though it was ordered by the provider. Colonoscopy was ordered for 15 of these patients and Cologuard was ordered for the remaining five patients. The reason screening was not completed was only documented for one of the 20 patients as "patient refused." Providers had also recommended colorectal cancer screening to five additional patients, but the patients had refused to have this

ordered. Reason for refusal was not included in the documentation. In total, 67 of the 84 ordered colonoscopies were completed and five of the 11 ordered Cologuard tests were completed.

After presenting these data to the two providers who attended the meeting, strategies were discussed to improve colorectal cancer screening rates and documentation of colorectal cancer screening completion. Three strategies were discussed during the meeting: delegate a clinic support staff to identify scheduled patients who need screening, have the provider document when screening is due on the patient's problem list, and add an alert on the patient "dashboard" to provide an immediate alert when screening is due. The providers believed these strategies could be easily implemented and will bring these options to their next provider meeting.

Discussion

The American Cancer Society (2019) found that as of 2019, 67.6% of people between the ages of 50 to 75 in Kentucky had undergone colorectal cancer screening. The results of this chart review were similar as 61% of the patients in this urban primary care clinic had completed colorectal cancer screening. However, it was determined that this clinic's colorectal cancer screening rate was below the national goal of 80%.

The results did not yield statistical significance in analyzing demographic variables and provider screening rates. It was determined that screening rates within the clinic are higher than what is documented to meet MACRA compliance. Therefore, providers are not receiving credit for some patients who have completed colorectal cancer screening. It also determined that this was due to error in documentation.

The USPTF recommends FIT testing as a tier 1 colorectal cancer screening detection test (Rex et al., 2017). Despite this recommendation, providers ordered Cologuard as a colorectal cancer detection test. Cologuard is not currently recommended as a first-tier test for colorectal cancer

detection. FIT testing was not ordered for any of the 120 patients whose charts were reviewed. Of the 84 patients who had colonoscopy ordered 67 of these patients underwent screening colonoscopy while only five of the 11 patients who had Cologuard screening ordered completed this testing.

Finally, the literature review showed that providers perceive barriers to colorectal cancer screening to be at the patient level (American Cancer Society, 2019). However, screening rates can be increased by 20% when recommended by providers (Knight et al., 2015). While the chart review revealed that some patients did not complete the ordered and recommended colorectal cancer screening, it was also determined that in some cases there was no documentation of the provider recommending colorectal cancer screening. This supports the idea that barriers occur both at the provider and patient level.

The meeting with the providers led to the discussion of potentially delegating clinic support staff to identify scheduled patients who need screening. The review of literature indicated that implementing a clinic facilitator improves the ordering process for screening and increases colorectal cancer screening rates (Weiner et al., 2017). The providers also discussed adding an alert on the patient "dashboard" to provide an immediate alert when screening is due. This coincides with the literature which has shown that implementation of an EMR alert system increases screening rates (Guiriguet et al., 2016).

Implications

It was determined that providers did not order screening for all patients who satisfy colorectal cancer screening criteria. Additionally, Cologuard testing was ordered rather than FIT testing. These results suggest that provider education regarding colorectal cancer screening may be indicated. This education should include both patient screening guidelines and recommendations

on modes of screening. More research is needed to determine the benefit of provider education regarding colorectal cancer screening. It would be beneficial to determine if rates of screening increase within this primary care clinic after this information was presented to providers.

It was also determined that the clinic's EMR was a barrier to determining if colorectal cancer screening was completed and in gaining MACRA credit. Clinic policies should be developed in order to adopt standard documentation of colorectal cancer screening completion. This in turn would increase MACRA credit for providers at this urban primary care clinic.

Limitations

There are several limitations in this project. Patient results were reviewed over the last 10 years. However, provider notes in the current EMR were only available for the past 5 years making it possible for screening to be unaccounted for if completion was not manually documented in the current EMR.

A second limitation is due to the possibility that documentation can be completed in a way that shows colorectal cancer screening was completed when in fact it had not been. If the provider ordered a colorectal cancer screening test and the patient does not complete the test, but the order is manually completed in the EMR, the patient appears to meet screening compliance based on MACRA guidelines. This was found to have happened in two of the 120 charts reviewed. This finding can have multiple implications. First, when reviewing the chart, it appears to the provider that the patient has completed colorectal cancer screening when they actually have not. This may cause the provider to not order screening even though it is indicated. This can also cause provider screening rates to appear higher than they actually are.

A final limitation was that only two of the six providers were able to attend the provider presentation following the chart review. One of the six providers had left the clinic and the other

three providers were not available at the time of the meeting. Had all providers been present more progress may have been made in determining solutions to the results of the chart review.

Conclusion

The purpose of this project was to determine screening rates and documentation mechanisms for colorectal cancer in an urban primary care practice, to determine how many patients completed the screening, and to present findings to the practice providers along with exploring ways to increase screenings. An additional purpose of this project was to determine and identify patient demographics which can impact rates of screening. The rate of screening was lower than the national goal of 80%. However, it was determined that there was not a statistical difference in screening rates based on gender, race, or location of residence. There was also not a statistical difference in rates of screening between providers or between physicians and nurse practitioners. It was also determined that colonoscopy and Cologuard were the only screening methods ordered within in this clinic, even though FIT testing is the first-tier recommendation for colorectal cancer detection. Providers are screening more patients than they are receiving credit for in terms of MACRA compliance. Future benefit may be seen by completing provider education and repeating the chart review to determine the effect that provider education has on rates of colorectal cancer screening.

References

American Cancer Society. (2017). Colorectal cancer facts and figures 2017-2019. Retrieved from https://www.cancer.org/content/dam/cancer-org/research/ cancer- facts-and-statistics/colorectal-cancer-facts-andfigures/colorectal-cancer-facts- and- figures-2017- 2019.pdf.

American Cancer Society. (2018). Cancer statistics center. Retrieved from https://cancerstatisticscenter.cancer.org/?ga=2.850993.1818075890.1563218574-640874215.1515959095#!/cancer-site/Colorectum.

Bibbins-Domingo, K., Grossman, D., Curry, S., Davidson, K., Epling, J., García, F., . . . Siu, A. (2016). Screening for Colorectal Cancer: US Preventive Services Task Force Recommendation Statement. *JAMA, 315*(23), 2564-2575.

Boyle, T., Keegel, T., Bull, F., Heyworth, J., & Fritschi, L. (2012). Physical activity and risks of proximal and distal colon cancers: A systematic review and meta-analysis. *Journal of the National Cancer Institute*, 104, 1548-1561.

Centers for Disease Control and Prevention. (2011). Colorectal cancer. Retrieved from https://www.cdc.gov/vitalsigns/cancerscreening/colorectalcancer/index.html.

Department of Health and Human Services. (2019). Quality Measures Requirements. Retrieved from https://qpp.cms.gov/mips/quality-measures.

Guiriguet, C., Muñoz-Ortiz, L., Burón, A., Rivero, I., Grau, J., Vela-Vallespín, C.,… Castells, A. (2016). Alerts in electronic medical records to promote a colorectal cancer screening program: a cluster randomized controlled trial in primary care. *The British Journal of GeneralP: The Journal of the Royal College of General Practitioners*, 66(648), e483–e490. doi:10.3399/bjgp16X685657

Health Pender Model. (2011, April 15). Retrieved June 10, 2019, from http://currentnursing.comtheory/healthypromotionmodel.html

Knight, J.R., Kanotra, S., Siameh, S., Jones, J., Thompson, B., & Thomas- Cox, S. (2015). Understanding barriers to colorectal cancer screening in Kentucky. *Preventing Chronic Disease*, 12, E95 doi:10.5888/pcd12.140586

Macrae, F.A. (2019). Colorectal cancer: epidemiology, risk factors, and protective factors. UpToDate. Retrieved from https://www.uptodate.com/contents/colorectal-cancer-epidemiology-risk-factors- and- protective-factors

National Cancer Institute. (2016). Colorectal cancer. Retrieved from https://www.cancer.gov/types/colorectal/screening-fact-sheet.

National Colorectal Cancer Roundtable. (2017). Working toward the shared goal of 80% screening for colorectal cancer for 2018. Retrieved from http://nccrt.org/what-we- do/80-percent-by-2018/.

The Kentucky Colorectal Cancer Screening Advisory Committee. (2016). Annual report July 2012 through June 2013. Retrieved from http://chfs.ky.gov/NR/rdonlyres/207DAFFB-63B8-40CD-934ED30F65FD42BD/0/2013ColonCancerScreeningAdvisoryCommitteeReportFinal.pdf

Patel, S.S., Kilgore, M.L., (2015). Cost effectiveness of colorectal cancer screening strategies. *Journal of the Moffitt Cancer Center*, 22(2), 248-258.

Pender, N.J. (2011). Health promotion model manual. *University of Michigan*. http://hdl.handle.net/2 027.42/85350

Rex, D.K., Boland, R.C., Dominitz, J.A., Giardiello, F.M., Johnson, D.A., Kaltenbach., Robertson, D.J. (2017). Colorectal cancer screening: recommendations for physicians and

patients from the U.S. multi-society task force on colorectal cancer. *The American Journal of Gastroenterology*, 112, 1016-1030.

Triantafillidis, J. K., Vagianos, C., Gikas, A., Korontzi, M., & Papalois, A. (2017). Screening for colorectal cancer: the role of the primary care physician. *European Journal of Gastroenterology & Hepatology*, 29(1), e1– e7. http://doi.org/10.1097/MEG.0000000000000759

U.K. Healthcare. (2020). Polk Dalton Clinic. Retrieved from https://ukhealthcare.uky.edu/polk-dalton-clinic.

Weiner B.J., Rohweder C.L., Scott J.E., Teal, R., Slade, A., Deal, A.M.,…Wolf, M. (2017). Using practice facilitation to increase rates of colorectal cancer screening in community health centers, North Carolina, 2012–2013: feasibility, facilitators, and barriers. *Prev Chronic Dis*, 14. DOI http://dx.doi.org/10.5888/pcd14.160454 external icon

Ylitalo, K.R., Camp, B.G., Meyer, R.U., Barron, L.A., Benavidez, G., Hess, B.H.,… Griggs, J.O. (2019). Barriers and facilitators of colorectal cancer screening in a federally qualified health center. *The Journal of the American Board of Medicine*, 32(2). DOI:10.3122/jabfm.2019.02.180205

Appendix A

Demographic Variables

Age
Gender
Race
Location of Residency
Colorectal Cancer Screening Status

Table 1. Gender Screening Completed

			Screening Completed		
			No	Yes	Total
Gender	F	Count	31	41	72
		% within Screening Completed	66.0%	56.2%	60.0%
	M	Count	16	32	48
		% within Screening Completed	34.0%	43.8%	40.0%
Total		Count	47	73	120
		% within Screening Completed	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.143[a]	1	.285		
Continuity Correction[b]	.771	1	.380		
Likelihood Ratio	1.152	1	.283		
Fisher's Exact Test				.342	.190
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 18.80.

b. Computed only for a 2x2 table

Table 2. Race Screening Completed

			Screening Completed		
			No	Yes	Total
Race	Black	Count	21	34	55
		% within Screening Completed	44.7%	46.6%	45.8%
	Hispanic	Count	2	5	7
		% within Screening Completed	4.3%	6.8%	5.8%
	White	Count	24	34	58
		% within Screening Completed	51.1%	46.6%	48.3%
Total		Count	47	73	120
		% within Screening Completed	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.471[a]	2	.790
Likelihood Ratio	.485	2	.785
N of Valid Cases	120		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.74.

Table 3. Distance Screening Completed

			Screening Completed		
			No	Yes	Total
Distance	1	Count	43	63	106
		% within Screening Completed	91.5%	86.3%	88.3%
	2	Count	4	10	14
		% within Screening Completed	8.5%	13.7%	11.7%
Total		Count	47	73	120
		% within Screening Completed	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.747[a]	1	.388		
Continuity Correction[b]	.328	1	.567		
Likelihood Ratio	.775	1	.379		
Fisher's Exact Test				.562	.288
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.48.

b. Computed only for a 2x2 table

Table 4. Screening Rates by Provider

			Screening Completed		
			No	Yes	Total
Provider	1	Count	6	14	20
		% within Screening Completed	12.8%	19.2%	16.7%
	2	Count	7	13	20
		% within Screening Completed	14.9%	17.8%	16.7%
	3	Count	10	10	20
		% within Screening Completed	21.3%	13.7%	16.7%
	4	Count	8	12	20
		% within Screening Completed	17.0%	16.4%	16.7%
	5	Count	5	15	20
		% within Screening Completed	10.6%	20.5%	16.7%
	6	Count	11	9	20
		% within Screening Completed	23.4%	12.3%	16.7%
Total		Count	47	73	120
		% within Screening Completed	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	5.631[a]	5	.344
Likelihood Ratio	5.679	5	.339
N of Valid Cases	120		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.83.

Group Statistics

	Screening Completed	N	Mean	Std. De
Age	Yes	73	58.03	
	No	47	60.15	

		Levene's Test for Equality of Va	
		F	Sig.
Age	Equal variances assumed	.472	
	Equal variances not assumed		

Table 5. Screening Rates by Provider Type

			Screening Completed		
			No	Yes	Total
Provider type	1.00	Count	21	39	60
		% within Screening Completed	44.7%	53.4%	50.0%
	2.00	Count	26	34	60
		% within Screening Completed	55.3%	46.6%	50.0%
Total		Count	47	73	120
		% within Screening Completed	100.0%	100.0%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.874[a]	1	.350		
Continuity Correction[b]	.560	1	.454		
Likelihood Ratio	.876	1	.349		
Fisher's Exact Test				.455	.227
N of Valid Cases	120				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 23.50.

b. Computed only for a 2x2 table