

Quality Improvement Measures for Increasing the Colorectal Cancer Screening Rates at a Community Health Center

Helen Hill, OMS IV; Beth Johnson, OMS IV; Lindsey Jader, OMS IV; Minder Bal, OMS IV; William Wang, OMS IV; Shipra Bansal, MD; and Joy H. Lewis, DO, PhD

From A.T. Still University—
School of Osteopathic
Medicine in Arizona (Mesa).

Financial Disclosures:
None reported.

Support: None reported.

Address correspondence to
Helen Hill, OMS IV,
2532 N 4th St, PMB 136,
Flagstaff, AZ 86004-3712.

E-mail: hshill@atsu.edu

Submitted April 20, 2015;
final revision received
August 21, 2015; accepted
August 24, 2015.

Introduction: Direct recommendation from health care professionals has been shown to generally increase colorectal cancer screening rates in the United States. However, data for rural, underserved communities are limited.

Objective: To increase colorectal cancer screening rates at a rural community health center (CHC) by increasing health care professionals' awareness of patients' screening eligibility.

Methods: Participants were health care professionals at a CHC treating patients eligible for colorectal cancer screening (defined as patients aged 50-74 years who visited the CHC between February 24, 2014, and March 15, 2014, and whose electronic medical records [EMRs] had no recording of colorectal cancer screening). For a 3-week period, these participants added electronic reminders to eligible patients' EMRs. Data reports for the screening rates of each participant, in addition to the overall CHC, were generated 4 weeks after the study period and compared with screening rates in 2013.

Results: Five health care professionals volunteered to participate. No statistically significant difference was found in screening rates of participants compared with overall clinic rates between the 2013 ($P=.639$) and 2014 ($P=.583$) sample dates. No statistically significant difference was found in the overall CHC screening rates ($P=.052$), which were 47.69% and 40.84% in 2013 and 2014, respectively. During the study period, 99 eligible patients were seen. An incidental finding revealed a substantial EMR flaw in uniform data system reporting measures: self-reported colorectal cancer screenings by patients, without official documentation provided, were documented in an EMR section that is not retrieved during uniform data system reporting.

Conclusion: No associated change in colorectal cancer screening rates was found at the CHC after increasing participants' awareness of patients' screening eligibility using electronic flagging. However, colorectal cancer screening results cannot be reported with certainty given that incidental documentation and data collection discrepancies were found.

J Am Osteopath Assoc. 2015;115(12):e20-e24
doi:10.7556/jaoa.2015.151

In the United States, colorectal cancer ranks fourth in overall morbidity and mortality.¹ The US Preventive Services Task Force has a Grade A recommendation for colorectal cancer screening using a fecal occult blood test, sigmoidoscopy, or colonoscopy in adults aged 50 to 75 years.² Guidelines from a 2008 multispecialty task force³ recommend an annual fecal immunochemical test (FIT), stool DNA test, or guaiac fecal occult blood test for patients who are unable to undergo standard screening options for early colorectal cancer detection and prevention. In such cases, health care professionals must also discuss the need for annual testing, the benefits and flaws of each option, and the need for invasive testing if a screening

result is positive. Despite participating in the Centers for Disease Control and Prevention's Colorectal Cancer Control Program through Arizona's FIT at Fifty HealthCheck Program, the screening rate at the rural community health center (CHC) where the present study was conducted was 39%, substantially below the Centers for Disease Control and Prevention's target screening of 80% in states funded by the Colorectal Cancer Control Program.⁴

As osteopathic physicians, screening for disease and preventive care is part of maintaining each patient's mind, body, and spirit. According to Sarfaty et al,⁵ the most effective method for improving screening rates was through a direct recommendation from a health care professional. Stone et al⁶ reviewed 81 controlled studies and analyzed the effectiveness of multiple interventions for preventive health screenings. For colon cancer screening, the most effective intervention components were organizational change, health care professional reminders, patient reminders, and patient financial incentive.⁶ Bundling effective interventions produced higher rates of screening. The proper documentation of colorectal cancer screening and accurate uniform data system (UDS) reporting of screening rates are important benchmarks for best medical practice.

The objective of the present study was to investigate the use of electronic reminders to increase the colorectal cancer screening rates at a CHC. We hypothesized that increasing awareness of patient colorectal cancer screening eligibility would lead to increased screening rates compared with the previous year.

Methods

The study was determined to be exempt from review by the institutional review board at A.T. Still University—School of Osteopathic Medicine in

Arizona. Participants were recruited during a weekly team meeting on a volunteer basis. They were told the goals of the project and had a chance to ask questions regarding the electronic flags, workflow, and potential risks. The participants, comprising osteopathic physicians, allopathic physicians, and physician assistants at a single CHC, agreed to have a research team member electronically flag the EMR of eligible patients at the start of a patient encounter. Eligible patients were aged 50 to 74 years who visited the CHC between February 24, 2014, and March 15, 2014, and who did not have a documented colon cancer screen (colonoscopy in the past 10 years, flexible sigmoidoscopy in the past 5 years, or hemoccult or FIT in the past year) in the cancer screening section of the EMR.

Research team members applied electronic flags to the EMR of any eligible patient scheduled in the upcoming week regardless of the reason for, or scheduled duration of, the appointment. Each participant was responsible for acknowledging the electronic flags during patient visits and determining whether to take action. The screening rate during the 3 weeks of the intervention was compared with the rate of the previous year during the same time. The screening rate of the current participants was also compared with the overall clinic rate during the same period to control for selection bias because participants were not randomly assigned. The screening rate in 2013 was determined by documentation in the cancer screening section of the EMR.

An algorithm was developed in collaboration with members of the research team, the director of the community health programs, and a data analyst at the CHC to retrieve the records of eligible patients who had scheduled appointments from February 24, 2014, to March 15, 2014. The research team added an electronic flag to the EMR of eligible patients that stated: "No colorectal screen

documented in flow sheet. If patient has had screening, get release of records.”

The medical records of patients scheduled for a given week during the study period were flagged at the beginning of the week. Data reports were generated 4 weeks after the last week of flagging to allow for patient screening turnaround. The data were tabulated as raw numbers without patient or participant identifiers. Screening rates of the participants and in the CHC were compared with the screening rates at the same time during the previous year. The results were compared using a 2-proportion z test.

Results

Five of the 23 health care professionals on staff agreed to participate. The same 5 participants were at the CHC in both 2013 and 2014. The community health programs had similar outreach programs during the timeframe of the study in both years. During the 3 weeks of flagging EMRs of eligible patients, the 5 participants saw 99 patients who met the inclusion criteria.

The use of electronic flags was not associated with any change in screening rates. The primary outcome demonstrated no statistically significant difference in colorectal cancer screening rates between the participants' and the overall clinic screening rates from February 25, 2013, to March 16, 2013, (45.39%, $P=.639$) and from February 24, 2014, to March 15, 2014, (38.26%, $P=.583$) respectively. No statistically significant difference was indicated in overall rates of screening in the CHC during the same time between 2013 and 2014 (47.69% and 40.84%, respectively; $P=.052$). No increase in the occurrence of “colonoscopy” in the EMRs' subjective section was indicated after the study timeframe.

Discussion

Our findings suggest that electronic flags were not associated with an increase in colorectal cancer

screening rates in eligible patients at a rural CHC. Interpretation of these results should take into account the limitation of short data collection duration and a small sample size.

The EMR flags were used for 3 weeks, with a 4-week turnaround period; however, this time is likely insufficient for accurately evaluating the effect of flagging on colorectal cancer screening. Expedient initial screening measures (FIT, stool DNA test, or guaiac fecal occult blood test) take at least 2 weeks to process. We inferred that for patients who decided to undergo screening, several weeks would be needed for testing, processing, and final reporting. A large, randomized study⁷ of uninsured patients in Texas compared the effectiveness of outreach methods on colorectal cancer screenings and defined successful screening participation, such as screening within 1 year after patient randomization into the study. This length of time resulted in a screening completion rate between 40.7% and 24.6% for FIT and colonoscopy outreach, respectively ($P<.001$). That completion rate is similar to the completion rate of the present study, but we did not differentiate between completions of new screening and baseline screening of the participants.

A 2011 study⁸ discovered that few health care professionals use evidence-based, comprehensive support strategies to screen patients. The results of the present study, examined through the lens of its limitations, offer an explanation. This research was dependent on a small sample of participants. Many of the health care professionals declined to participate because they considered the reminders distracting or unwarranted. These individuals informed the authors of the present study that they preferred to draw their own conclusions on when patients needed screening rather than trusting EMR reminders to indicate that a patient was due for screening. A discussion with the individuals who declined to participate along with leaders of the community health programs at the CHC in the

present study revealed that without official documentation, these individuals incorporated self-reported screenings as subjective information in the EMR or did not complete the cancer screening section of the EMR. This finding is consistent with another study⁹ that demonstrated resistance to clinical decision support systems when systems could not be tailored for a specific need. Indeed, the EMR used by our CHC currently does not allow health care professionals to indicate that a screening result is patient reported within the cancer screening section. A UDS report is collected by extracting data from the cancer screening section. The subjective section where providers indicate patient-reported cancer screenings is not retrieved during typical UDS reporting. The CHC periodically does a manual audit, which can indicate the rate of reporting that is in this irretrievable section; however, this information is not then added to the annual UDS reports. The UDS-reported colorectal cancer screening rates for the present study may therefore underestimate the actual screening rates.

An additional system issue was the manual application of an EMR alert for eligible patients with a standing appointment. Annual wellness examinations provide physicians time to focus on preventive medicine.¹⁰ However, most patients do not attend annual wellness examinations; instead, they see health care professionals for problem-focused visits. In the present study, electronic flags were applied to the EMR of any eligible patient scheduled in the upcoming week regardless of the reason for, or scheduled duration of, the appointment. Further emphasizing the importance of appointment designation is a 2006 study¹⁰ that evaluated methods for increasing chlamydia screening. The results found that medical record prompts did not statistically significantly increase the likelihood that a patient would be tested. The predicting factor for increasing screenings was whether a patient scheduled a preventive care visit.

In cases of patient self-reporting of colorectal cancer screenings, health care professionals should obtain official records to ensure that the patient is indeed not at risk and to establish accurate screening reports. Additionally, EMR systems should be evaluated and tailored to adequately support the preventive medicine goals of CHCs. Although screening alerts may seem untimely during an acute-care visit, they may serve as critical point-of-care opportunities to emphasize the importance of preventive care appointments and to schedule examinations. Health care professionals can also use these opportunities to educate patients on the various genetic and environmental factors that affect the structure and function of the bowels. Empowering patients to maintain healthy lifestyle habits reinforces principles of self-regulation and self-healing that underlie cancer prevention. When patients are eligible for colorectal cancer screening, health care professionals need to consider the whole patient, including cultural factors and social determinants of health care. Ultimately, any benefit of electronic reminders may be severely diminished if an EMR is flawed such that providers are frustrated and become less likely to follow subsequent prompts. In keeping with an integrated health care approach, similar quality improvement measures may be needed for other preventive screening programs.

The findings of the present study contribute to a growing body of literature on EMRs, screening measures, and health maintenance protocols. In particular, CHCs and health care professionals in underserved areas may find it beneficial to revisit methods available for effective colorectal cancer screening and ensure that efforts are accurately represented in the EMR.

Conclusion

Although we did not find a statistically significant difference in screening rates using electronic

reminders, the findings do highlight a need to further evaluate the accuracy of data reports on the basis of EMR data. Given the limitations noted, the UDS-reported screening rates may underestimate true screening rates, and provider colorectal cancer screening efforts may not be accurately reflected in UDS measures. Discrepancies between EMR documentation and data reports may lead to inappropriate provider notifications and patient screening prompts. Best medical practice could be enhanced by updating recording options in an EMR and allocating CHC resources to get official documentation of patient screening results. Such improvements may increase the usefulness of reminders and lead to more successful screening efforts overall. Rational treatment for patients is based, in part, on what is recorded in an EMR. Therefore, the accuracy of this technology is vital for patients and physicians.

Acknowledgments

We thank Benjamin Meyer, OMS IV; Jens Brown, OMS IV; Weston Harkness, OMS IV; Brandon Worth, OMS IV; and Mario Roldan, OMS IV, for their work as part of the research team. We thank Marjorie Kinney, MEd, for data analysis and Sean Clendaniel, MPH; Elizabeth Markona; Amy Stenberg; and Steve King for their support during the study.

Author Contributions

All authors provided substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; all authors drafted the article or revised it critically for important intellectual content; all authors gave final approval of the version of the article to be published; and all authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

- 2008-2012 top ten cancers. Centers for Disease Control and Prevention website. <https://nccd.cdc.gov/uscs/toptencancers.aspx>. Accessed November 2, 2015.
- Levin B, Lieberman DA, McFarland B, et al. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology [published online February 8, 2008]. *Gastroenterology*. 2008;134(5):1570-1595. doi:10.1053/j.gastro.2008.02.002.
- Colorectal cancer: screening. US Preventive Services Task Force website. <http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/colorectal-cancer-screening>. Accessed October 2, 2015.
- Colorectal Cancer Control Program (CRCCP). Centers for Disease Control and Prevention website. <http://www.cdc.gov/cancer/crccp/about.htm>. Accessed October 2, 2015.
- Sarfaty M, Doroshenk M, Hotz J, et al. Strategies for expanding colorectal cancer screening at community health centers. *CA Cancer J Clin*. 2013;63(4):221-231. doi:10.3322/caac.21191.
- Stone EG, Morton SC, Hulscher ME, et al. Interventions that increase use of adult immunization and cancer screening services: a meta-analysis. *Ann Intern Med*. 2002;136(9):641-651. doi:10.7326/0003-4819-136-9-200205070-00006.
- Gupta S, Halm EA, Rockey DC, et al. Comparative effectiveness of fecal immunochemical test outreach, colonoscopy outreach, and usual care for the underserved: a randomized clinical trial. *JAMA Intern Med*. 2013;173(18):1725-1732. doi:10.1001/jamainternmed.2013.9294.
- Yabroff KR, Zapka J, Klabunde CN, et al. Systems strategies to support cancer screening in U.S. primary care practice [published online October 5, 2011]. *Cancer Epidemiol Biomarkers Prev*. 2011;20(12):2471-2479. doi:10.1158/1055-9965.EPI-11-0783.
- Ash JS, Sittig DF, Campbell EM, Guappone KP, Dykstra RH. Some unintended consequences of clinical decision support systems. *AMIA Annu Symp Proc*. 2007:26-30.
- Scholes D, Grothaus L, McClure J, et al. A randomized trial of strategies to increase chlamydia screening in young women [published online June 19, 2006]. *Prev Med*. 2006;43(4):343-350. doi:10.1016/j.ypremed.2006.04.019.

© 2015 American Osteopathic Association