

The Use of the Whole Primary-Care Team, Including Community Health Workers, to Achieve Success in Increasing Colon Cancer Screening Rate

Paul R. Arsenault, Laura St. John, Liam M. O'Brien

Abstract: The National Colorectal Cancer Roundtable, an organization cofounded by the American Cancer Society and the Centers for Disease Control and Prevention, has set an aggressive goal to achieve an 80% colon cancer screening rate by the year 2018 to reduce the burden of colon cancer in the United States. This goal is in alignment with the primary care movement to focus on prevention and population health. However, colon cancer screening has been proven as an especially challenging preventive measure to get traction on with patients. Oakland Family Medicine, a medium primary care practice in Maine, has engaged in a quality improvement project to increase the colon cancer screening rates from 28%, when the project started, to 80.3%. To achieve these results, it required a redesign of the primary care team, including the use of team extenders like community health workers. In addition, it requires understanding the data and its flaws, knowing the workflow and working to simplify it, and finally, to be clear what problem you are trying to solve. The Oakland Family Medicine project shows that closing the gaps in care for colon cancer screening is not only possible but that the new national goal is attainable also.

Based on our experience, we have found that among all cancer screenings and preventive services, colon cancer screening is often the least appealing conversation for patients. As part of our work with patients, we tried to ascertain why the situation was like this. Patient feedback collected by the community health workers (CHWs) helped to identify these barriers. The individual barriers that our patients experience include a lack of engagement, concern over the invasive nature of the colonoscopy, and the preparation required for the procedure (Figure 1). These individual barriers make simply reminding and referring patients while in the examination room less effective than with other preventive services.

Oakland Family Medicine is a medium-sized primary-care practice that is hospital owned and located in the Kennebec Valley in Maine. Our practice has been part of the community for nearly 30 years. We provide care to nearly 3,900 patients. Our practice is 58% female and 42% male; 66% of our patients are between the ages of 19 and 64, 24% are 65+, and the remaining 10% are pediatric and adolescent. Our insurance breakdown is 58% commercial insurance, 40% have a government payer (Medicaid, Medicare) and two percent uninsured or free care. Oakland Family Medicine has achieved level 3—Patient-Centered Medical Home recognition and additional recognition from National Committee for Quality Assurance (NCQA) for diabetes and heart/stroke care (National Committee for Quality Assurance, n.d.). Our practice team is

Background

The National Colorectal Cancer Roundtable (NCCRT), an organization cofounded by the American Cancer Society and the Centers for Disease Control and Prevention, has set an aggressive goal to achieve an 80% colon cancer screening rate by the year 2018 to reduce the burden of colon cancer in the United States (National Colorectal Cancer Roundtable, n.d.). The achievement of this goal will force health systems and, in particular, primary-care offices to rethink how they focus on prevention and population health. Even more importantly, it forces them to evaluate who in the care team is best skilled at closing these types of gaps in care.

Keywords

colorectal cancer
screening
community health
worker
primary care
immunochemical fecal
occult blood test

Figure 1. Patient barriers to obtain colorectal screening.

| Barriers: to Completing Colorectal Cancer Screening | | |
|--|--|---|
| Patients self-identified barriers to receiving a colorectal cancer screening. The barriers indicated below were both from the patient's perspective prior to working with a Community Health Worker, and from the Community Health Worker's perspective while trying to facilitate screening compliance. | | |
| Frequency of barrier is noted in parentheses. | | |
| Health System | Community | Individual |
| Length of time from patient agreeing to have colonoscopy and having appointment scheduled with specialty practice (78) | Lack of transportation prevented patient from attending appointment (16) | Patient reluctant to have colonoscopy due to embarrassment and fear from stories of others' bad experience (9) |
| | | Literacy or clarity issues prevent patient from understanding complex instructions for prep (5) |
| | | Language barrier; limited or does not speak English (2) |
| | | Hearing-Impaired (1) |
| | | Lack of follow-through (engagement) by patient (61): <ul style="list-style-type: none"> • Returning Phone Calls • Returning Paperwork • Returning FIT tests • Picking up their mail |

composed of three Medical Doctors, one Osteopathic Doctor, a Physician Assistant, a Registered Nurse/Care Manager, Medical Assistants, clerical staff, and a Licensed Clinical Social Worker who provides integrated behavioral healthcare. This team has worked on improving population health measures for the past several years to achieve the NCQA recognition (heart/stroke and diabetes) and has that success to build on. However, as we began our

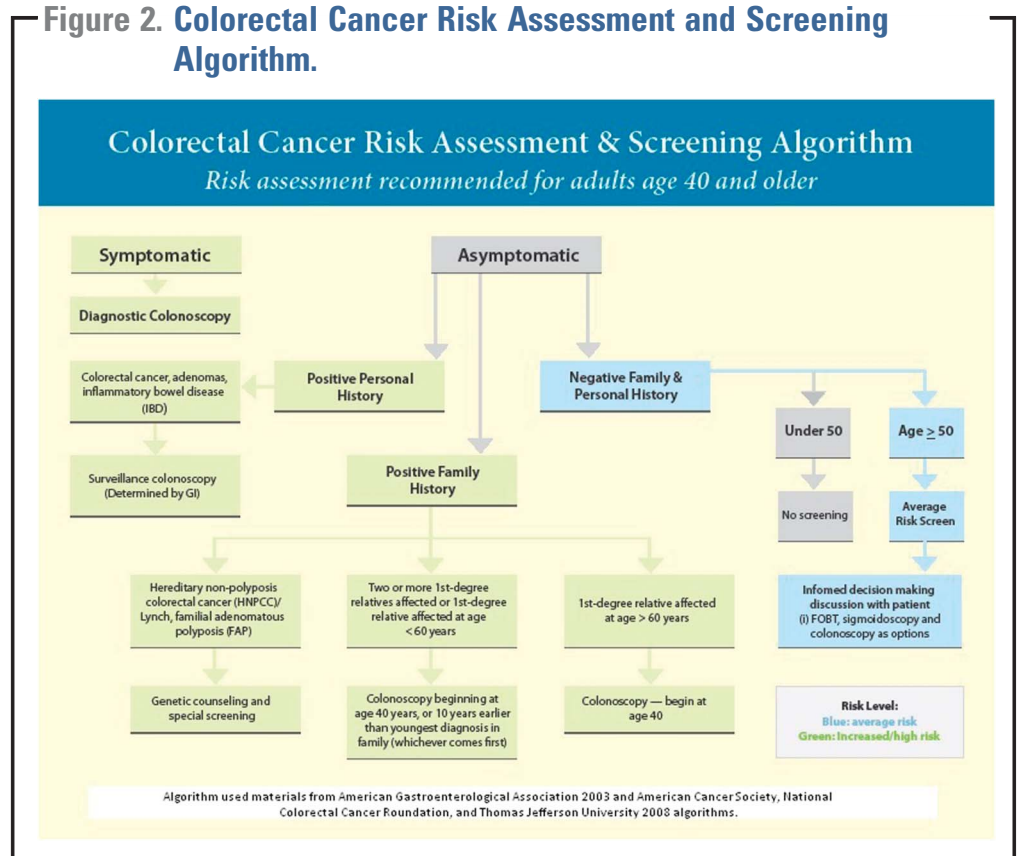
first PDCA (Plan-Do-Check-Act Process Improvement Methodology) in October of 2013 our rate seemed to be an abysmal 28%, significantly lower than the national rate of 65% (Centers for Disease Control and Prevention, 2013).

Our first PDCA was to understand our data and uncover the root causes of the lack of compliance with colorectal cancer screening recommendations. As we began to investigate why our rate was so low by

means of chart audits, it became clear that part of the challenge started in 2012 when we transitioned from paper-based medical records to an electronic medical record (EMR) and made the business decision to enter data only when patients were being seen. This meant that not all data had been entered and when data were entered as patients had arrived, we did not always go back far enough in the paper records to find all colonoscopies. While working with our clinical support team (medical assistants and a registered nurse) we formed a report of all patients overdue for colon cancer screening and began pulling the archived paper charts and entering these data into the EMR. By the February of 2014, we completed the manual review of archived charts and successfully raised our screening rate to 57.75%. This process also allowed us to review the quality of the reporting that we had from our EMR and determine where modifications to the report would be needed.

One area that became clear as a gap in our reporting capacity was reporting on patients who had opted to receive an annual fecal occult blood test (FOBT) instead of a colonoscopy. Fecal occult blood test results were not being reported as having met the colon cancer screening requirement within the EMR. In addition, we did not have a way to track and report on patients who refused to have a colonoscopy or their associated risk status. Our second PDCA involved staff from the Prevention Center, Clinical Integration, Elmwood Primary Care (Oakland’s sister practice) and the laboratory in a workgroup to review and discuss methods to increase colorectal cancer screening rates. The workgroup analyzed workflow, documentation, and reports to recognize patients overdue for screening. We developed an algorithm (Figure 2) to standardize the risk assessment of colon cancer, informed by algorithms from the American Gastroenterological Association, National Colorectal

Figure 2. Colorectal Cancer Risk Assessment and Screening Algorithm.



Cancer Roundtable, American Cancer Society, and Thomas Jefferson University algorithms. This served as the foundation to establish a standard workflow for colorectal cancer screening, which is essential when patients are identified and educated through proactive outreach, then referred through the practice at an increased capacity. After working with the Clinical Integration and Information Technology departments, we were able to add discrete fields to the EMR for tracking risk status and refusal, as well as the ability for the report to process FOBT or IFOBT (immunological fecal occult blood test) as meeting the colon cancer screening requirements.

Evidence from a randomized clinical trial suggested that offering only a colonoscopy as an option for colon cancer screening may decrease adherence to overall screening (Inadomt et al., 2012). This has led our providers to provide a FOBT as an option for patients at average risk for colon cancer. However, the current FOBT required that patients follow a restricted diet and had complex instructions. Therefore, our practice switched from the FOBT to the Fecal Immunochemical Test (FIT or IFOBT). Both are office-based screening methods; however, the FIT test is more reliable and requires no preparation or restricted diet. Not only does the FIT encourage higher patient compliance to screening but the FIT also has higher sensitivity and specificity for detecting cancer and adenomas than the guaiac FOBT. Researchers have argued and other countries have adopted FIT as the preferred test for population-based colon cancer screening programs (Allison et al., 2014).

By the fall of 2014, we started to reach a point where simply improved reporting and reminding patients of the need for screening was not enough. This led to our third PDCA. Our workflow was present for the medical assistants as part of their visit prework (proactive office encounters) to document which patients needed screening and for the provider to address screening as part of the visit. The visit prework reviews preventive measures and chronic diseases, and tries to ensure that

there are no gaps in care for our patients. At this time, we were approached by the Prevention Center, a department of the hospital which had successfully applied for and received a State Innovation Model grant through the Department for Health and Human Services, to fund the use of CHWs to help improve prevention and chronic disease management of our population. When applying for this grant, the Prevention Center performed chart reviews of all patients who were not up to date on colorectal cancer screening at Oakland Family Medicine and identified approximately 66% of those overdue as having a behavioral health diagnosis, chronic pain, or both. Over 90% of these patients had insurance, but had not been screened.

The Community Guide, a compilation of scientific evidence and systematic reviews of community-based health promotion and disease prevention interventions from The Community Preventive Services Task Force, recommends client reminders, small media (i.e., patient letter), one-on-one education, and reducing structural barriers (i.e., transportation) as effective interventions proven to increase colorectal cancer screening rates (Guide to Community Preventive Services, n.d.). The Community Health Worker project combined these interventions to increase the chances of success and have an impact on the greatest number of patients. Community health workers are trusted members of the community with knowledge of the community, its citizens, and community resources. They are lay persons with no higher education degree and they have a significant knowledge of the resources available and the ability to engage patients in a meaningful empowering conversation using motivational interviewing. Community health workers are managed, staffed, and trained by the Prevention Center, with a period of practice-specific orientation at the primary-care practice. The CHWs attended a 2-day motivational interviewing training and then completed a 45-hour statewide Community Health Worker Core Competencies Course developed by the Central Massachusetts Area Health

Education Center (n.d.). In addition to the medical and administrative practice staff, the CHWs are supported by a team of experienced health education staff who provide orientation around community resources and colorectal cancer specific patient navigation.

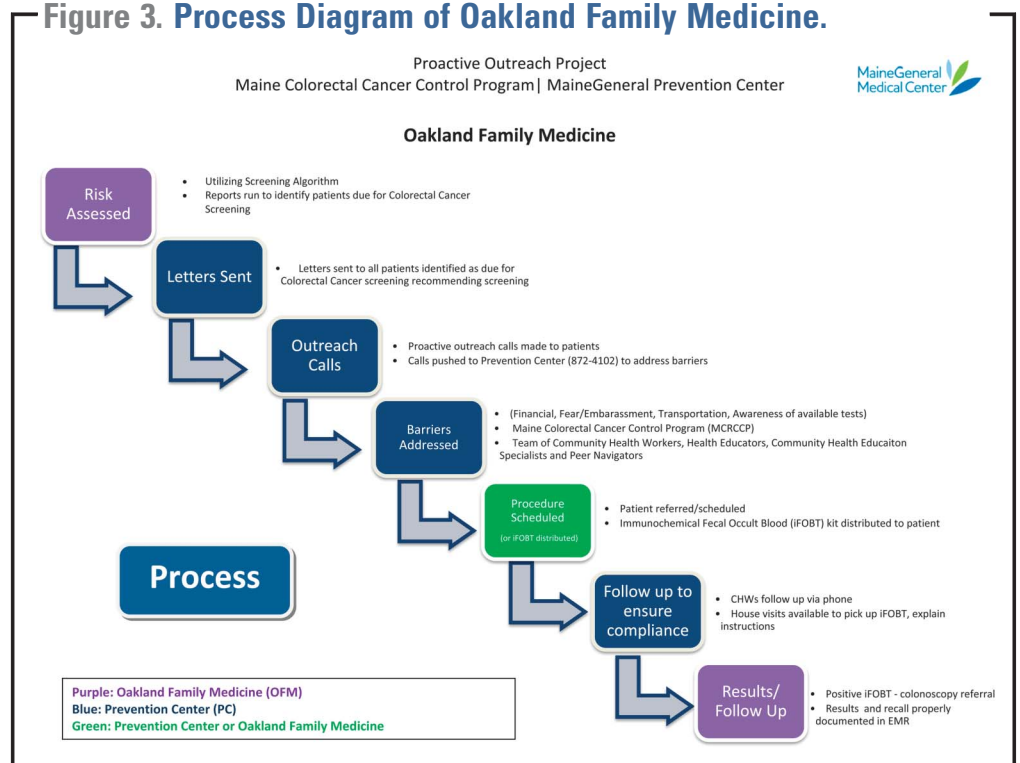
The Plan-Do-Check-Act process 3 was a collaboration focused on identifying barriers to closing the gap from 57% to our goal of 80%. Through discussion with Prevention Center staff and practice staff we identified two key areas of focus: communication with patients and outreach to patients.

Communication was an important barrier to address because some of the patients were not being actively arriving at the office. We needed to create ways to reengage with the patient. Some of the patients had been in and had been counseled on the importance of screening, whereas others had been in and not counseled. The interdepartmental team agreed to mail a letter to each patient sent from their provider that talked about the importance of screening and offered the

patient contact with the CHW to discuss any concerns or barriers to care.

The CHWs followed up on the letters to make connections and provide proactive outreach to all patients. This outreach also provided a forum to learn about concerns and barriers (Figure 1) and offer education on all options for colon cancer screening using motivational interviewing. This was especially important as a CHW was able to meet a patient in the community or at the patient's home. Through additional funding from the Department for Health and Human Services' Centers for Disease Control and Prevention grant and the Maine Colorectal Cancer Control Program, the Prevention Center was able to offer a safety net for some uninsured and underinsured patients and providing free colon cancer screening to average risk patients in need of screening (Figure 3). Being in a rural area with a large geographic footprint limits the number of public transportation options available; and even when it is available, often patients are unable to be discharged after their procedure alone because of the sedation

Figure 3. Process Diagram of Oakland Family Medicine.



used during the procedure. For some of these patients, the CHW was able to ride the bus or taxi or arranged for bus or taxi transportation. Other patients were too anxious to go for the procedure alone and the CHW was able to attend them after they had established a relationship. The CHW met the patient where they were and worked in partnership with the office to address barriers. Initially, a handful of patients did not follow through after agreeing to complete an FIT test and pick up the test at the practice. The CHWs began delivering and picking up FIT tests, which resulted in increased compliance.

Outcomes

Community health workers have proven to be an effective extension of our team providing care outside the office. They were able to customize their approach using mini-PDCA cycles along the way to meet the needs of a smaller population of patients whose social and or economic barriers prevent them from achieving their health goals. Our CHW model has been proven to be financially viable as well. In the 10 months that the CHWs were involved, the expenses of CHW were approximately \$62,000 (1.5 full time equivalent with benefits and expenses) and assuming the average Medicare colonoscopy reimbursement of \$915.00 (Maine Colorectal Cancer

Control Program), we screened an additional 91 patients which generated approximately \$84,000 in revenue. In addition, this analysis does not include the savings of the patient and system for early detection of colon cancer which average \$51,569 in the first year of treatment (National Cancer Institute, 2010).

Since November 2014, we have sent 459 letters to patients who lacked colon cancer screening, 304 of these received phone interventions as well. Of the 304 who received a phone call, 111 patients had already had a colonoscopy performed but the results had not reached the primary-care office. With this information, we were able to reach out to the specialty offices and get the results. An additional 162 agreed to have the screening and 91 have already gone for the procedure with 34 referred and waiting for scheduling. One quarter of the patients who agreed to be screened elected for the FIT test. Over 75% of the patients reached by a CHW for education and support agreed to be screened.

The use of PDCA cycles has helped our practice to go from a low of 28% to 80.3% and achieving the national goal for screening 3 years early (Figures 4 and 5). For statistical purposes, our data (Figure 5) were analyzed with a mixed-effects modeling strategy. Records before 2014 were excluded because the transition from paper records to EMR was not complete; we included records from September 2014

Figure 4. Oakland Family Medicine Results over Time.

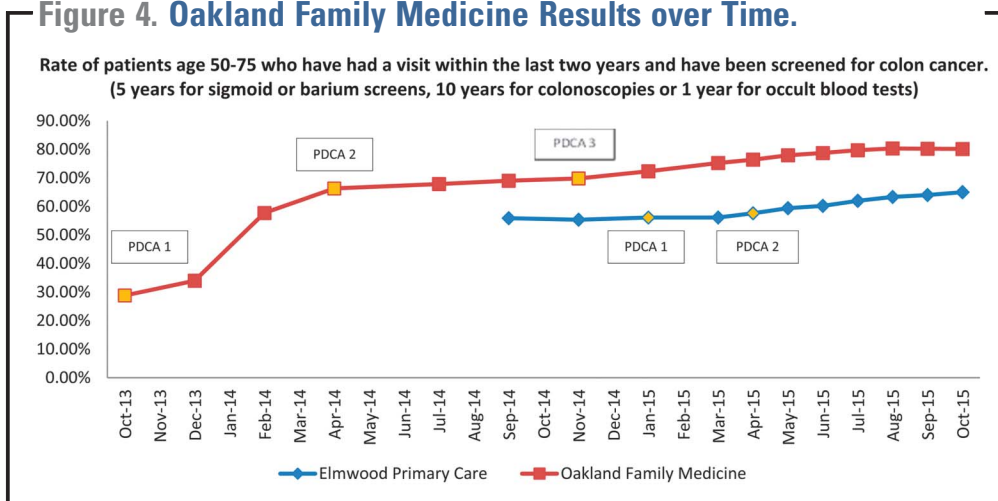


Figure 5. Oakland Family Medicine Results Data Table.

| Month - Yr | Oakland Family Medicine - Colorectal Cancer Screening Rate | Oakland Family Medicine - Numerator/Denominator | Oakland Family Medicine - PDCA Cycle | Elmwood Primary Care - Colorectal Cancer Screening Rate | Elmwood Primary Care - Numerator/Denominator | Elmwood Primary Care - PDCA Cycle |
|------------|--|---|--|---|--|--|
| Oct-13 | 28.80% | 426/1479 | PDCA1: Chart audits | 53.55% | 1101/2256 | |
| Dec-13 | 34% | 512/1505 | | | | |
| Feb-14 | 57.70% | 856/1516 | Chart Audits Complete | | | |
| Apr-14 | 66.30% | 1013/1528 | PDCA 2: Standard Workflow & Report Enhancements | 55.34% | 1176/2125 | |
| Jul-14 | 67.85% | 1034/1524 | | 55.89% | 1214/2172 | |
| Sep-14 | 69% | 1042/1510 | | 55.36% | 1234/2229 | |
| Nov-14 | 69.78% | 1056/1524 | PDCA 3: Algorithm introduced, iFOBT test offered, Community Health Workers Began | 55.40% | | |
| Dec-14 | 71.16% | 1088/1529 | | 55.80% | | |
| Jan-15 | 71.73% | 1129/1574 | | 55.30% | | PDCA 1: Chart audits |
| Feb-15 | 71.90% | 1091/1518 | | 56.10% | 1241/2212 | |
| Mar-15 | 74.00% | 1119/1512 | | 55.90% | 1239/2216 | PDCA 2: Algorithm introduced, iFOBT test offered, Community Health Workers Began |
| Apr-15 | 76.70% | 1188/1549 | | 57.60% | 1272/2227 | |
| May-15 | 78.20% | 1215/1554 | | 59.40% | 1310/2248 | |
| Jun-15 | 78.20% | 1222/1562 | | 60.20% | 1354/2265 | |
| Jul-15 | 79.10% | 1244/1573 | | 62.00% | 1406/2267 | |
| Aug-15 | 80.30% | 1251/1557 | | 63.30% | 1434/2265 | |
| Sep-15 | 80.20% | 1255/1565 | | 64% | 1444/2257 | |
| Oct-15 | 80.10% | 1255/1567 | | 65% | 1466/2257 | |

OFM Average Monthly Increase following CHW/FIT intervention: 0.82 (11 Months)

EPC Average Monthly Increase following CHW/FIT intervention: 1.3 (7 Months)

through September 2015, using quarterly data. Fixed effects were included for time period and whether the measurement was taken during an intervention period or not. No specific pattern (e.g., linearity) was assumed for the temporal trajectory. Each practice site also had a random intercept term included to allow it to have its own center effect, thus accounting for within-practice correlation. The response was the change in screening rate from the previous quarter. A significant increase in the number of patients screened was seen throughout the intervention period ($F = 10.62$, num $df = 4$, den $df = 3$, $p < .0001$). A mean increase in the proportion screened on 11.44% was seen during this period. This

analysis indicates a significant increase in the proportion of patients screened.

Conclusion

Most of this work was completed through CHWs outreaching to patients. Although limited resources restrict the immediate expansion of this project, the existing 1.5 full time equivalent CHWs successfully moved to Oakland's sister practice, Elmwood Primary Care, and increased their colorectal cancer screening rate at a higher rate of change than that occurring at Oakland (Figure 5). The success of this project at both the primary-care practices has gained the support of leadership.

Leaders in the system are committed to sustaining this work and continue to partner with the Prevention Center to seek additional grant funds, and negotiate with insurance companies to include this work in future payer contracts.

As we determine the next steps and future PDCA cycles, we are now expanding our use of CHWs to help patients who struggle to thrive in the traditional primary-care model of chronic illness. We continue to improve data tracking methods with an ongoing review and revision of population health reports. Patient specific, community, and system barriers identified throughout the process will help inform conversations for the much-needed system change. We are confident the results of these PDCA cycles can be sustained. The approach discovered through our PDCA cycles to manage colon cancer screening will now expand to be implemented in other primary care practices in the system to help all achieve the 80% goal by the target date in 2018.

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Authors' Biographies

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The authors declare no conflict of interest.