Collaborative colorectal cancer screening: a successful quality improvement initiative

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“Providing the right care at the right time, in the right way, in the right place, in the right amount, at the right price and being able to prove it” is one way to characterize quality. Our chief executive officer, Joel Allison, has encouraged us to think in these terms. Other mentions of quality goals exist throughout the Baylor organization. The mission of Baylor Health Care System refers to “exemplary health care,” and the vision statement declares that Baylor Health Care System will, before the end of this decade, become the most trusted source of comprehensive health services. On September 26, 2000, the board of trustees of Baylor Health Care System resolved “to give patient safety and continuous improvement in the quality of patient care the highest priority.”

To further these goals, a systemwide Best Care Committee has been formed to focus on quality outcomes and continuous improvement. In addition, more than 2 dozen physicians from the Quality Committee of the HealthTexas Provider Network have attended and graduated from the Advanced Training Program in Health Care Delivery Improvement at Intermountain Health Care in Salt Lake City. The course director, Dr. Brent James, describes quality improvement as the “science of process management,” with its purpose being “to close the gap between practice and the best available evidence.” Attendees are taught tools and techniques to rapidly challenge and improve the delivery of health care. Students are required to complete quality improvement projects. They are also encouraged to continue to investigate and attempt to improve the delivery of health care in their field of influence.

The following article is the first such project to be published in the health care research and improvement section of BUMC Proceedings. Instead of using the introduction, methods, results, discussion format, it applies a structure that is more appropriate for quality improvement projects, as proposed by BMJ and Quality and Safety in Health Care (1, 2). Joyce Stroud, DO, a member of the HealthTexas Quality Committee and a graduate of the Intermountain Health Care course, demonstrates how she propelled the Southlake Family Medicine division of HealthTexas to top rankings for screening of colon and rectal cancer.

Problem: Low screening and referral rates for colorectal cancer at a primary care clinic suggest the need for alternative methods to identify patients and complete the screening process.

Design: A review of >5000 medical charts established baseline screening and referral data. After a 3-month trial of a screening protocol, the research team conducted a follow-up medical chart review to determine referral levels.

Background and setting: The clinic is an 8-physician primary care facility in Southlake, Texas, and is one of 36 clinics affiliated with HealthTexas Provider Network.

Key measures for improvement: The goal was to increase referrals for colorectal cancer to at least 85% among patients aged 50 to 75 years.

Strategies for improvement: The entire staff of the primary care clinic and the gastroenterology office became involved in the referral process. The team used simple tools such as chart stickers to draw attention to patients requiring screening, generation of referral forms that were numbered for follow-up and faxed to the gastroenterologists, and patient educational material on colorectal cancer screening. These tools were designed to overcome specific barriers to successful screening that the team had identified.

Effects of change: Referrals for sigmoidoscopy, colonoscopy, and double-contrast barium enema increased from 47% to 86%. Fecal occult blood testing was arranged for additional patients through the primary care office. Revenues related to colonoscopies increased by about 50% for the gastroenterologist group, the hospital, and the pathology group affiliated with Southlake Family Medicine.

Lessons learned: This colorectal cancer screening protocol succeeded in its 3-month trial because it was collaborative, opportunistic, simple, and made good business sense. The protocol is now being implemented at other HealthTexas Provider Network offices.

Physicians and patients alike are well aware of the importance of regular screening for the early detection of colorectal cancer, which is the second leading cause of cancer-related deaths and is the third most frequently diagnosed cancer among men and women in the USA. Public awareness campaigns to encourage regular screening for colorectal cancer include educational material distributed through physician offices, celebrities undergoing sigmoidoscopy on television, “trav-
resulting in 5017 total records reviewed. The auditors looked for abstractors examined approximately 30 records per physician, by 172 HTPN physicians in 36 practices, including SFM. Nurse patients aged 50 to 75 years seen between July 2000 and July 2001 they conducted a medical chart audit utilizing a population of management approach to organize their efforts, with an emphasis on graphic colonography. suggest newer screening technologies such as computed tomo-scopy, and double-contrast barium enema (DCBE) but did not such as fecal occult blood testing (FOBT), sigmoidoscopy, colon- SFM team focused on all currently available screening methods does not recommend a preferred method (27). Consequently, the Force unequivocally recommends colorectal cancer screening, it KEY MEASURES FOR IMPROVEMENT

The team sought to identify methods to increase to at least 85% the number of patients aged 50 to 75 years scheduled for screening (8, 25, 26). Although the US Preventive Services Task Force unequivocally recommends colorectal cancer screening, it does not recommend a preferred method (27). Consequently, the SFM team focused on all currently available screening methods such as fecal occult blood testing (FOBT), sigmoidoscopy, colonoscopy, and double-contrast barium enema (DCBE) but did not suggest newer screening technologies such as computed tomographic colonography.

DESIGN

The team used the “plan, do, check, act” total quality management approach to organize their efforts, with an emphasis on rapid-cycle improvement. To determine baseline screening rates, they conducted a medical chart audit utilizing a population of patients aged 50 to 75 years seen between July 2000 and July 2001 by 172 HTPN physicians in 36 practices, including SFM. Nurse abstractors examined approximately 30 records per physician, resulting in 5017 total records reviewed. The auditors looked for the frequency with which physicians recommended colorectal cancer screening. The data were subdivided to create baseline data for SMF and for HPTN. Chart audits continued quarterly. The final audit covered the 3-month period beginning in May 2002, when the protocol was implemented, so that the team could review the results of the intervention.

STRATEGIES FOR IMPROVEMENT

The intervention involved the full range of clinic and referral staff—primary care physicians and nurses, front-desk personnel, schedulers, gastroenterologists, gastrointestinal laboratories, and insurance companies—to meet referral goals. Clinic personnel applied the intervention strategy to each patient in the target population. During check in, front-desk staff prominently marked the patient’s HTPN billing slip, known as a superbill, with a large red “C.” This reminded the physician and nurses to discuss colorectal cancer screening with the patient. Prior to the patient’s examination by the physician, nurses reviewed the patient’s chart for previous colorectal referrals or screening within proper time limits. If the patient did not comply with prior referrals, the nurse discussed this with the patient to determine why. The nurse also provided new educational material (28) to all patients who either had no prior recommendation for screening or who had failed to complete suggested screening, creating an opportunity for the patient to raise questions or concerns about colorectal cancer or the screening process.

The physician then discussed the need for colorectal cancer screening with the patient as part of the physical exam. If the physician determined that colonoscopy was appropriate, the primary care clinic staff gave the patient a preparatory checklist and faxed a notification to the gastrointestinal clinic alerting it to the prescribed exam. The primary care clinic staff numbered each faxed notification to facilitate tracking and follow-up. For sig-moidoscopy or DCBE, the primary care clinic staff sent the recommenda-tion to the referral department. For FOBT tests, the clinic staff ensured that the patient received the kit before leaving the office.

Office staff at the gastrointestinal clinic received the referral notification from the primary care clinic and precertified the patient with the insurance provider. The staff then called the patient to schedule the appointment. Once the exam was completed, the gastrointestinal clinic staff notified the primary care clinic by fax that the patient underwent the exam. The results of the exam, if completed, were sent by mail. The primary care clinic staff entered the results into the patient’s chart. If the patient failed to show up for the exam, the primary care clinic nurses discussed this with the patient during the subsequent visit to the primary care facility. As an additional check, the primary care clinic staff checked with the gastrointestinal clinic staff weekly to ensure that all numbered referral facsimiles were accounted for and to confirm that the patients had indeed scheduled or undergone the procedure.

EFFECTS OF CHANGE

Colorectal cancer referral rates for SFM increased from the baseline of 47% in fiscal year 2001 to 86% for the period of May through July 2002 (Figure). This referral rate does not include
all cases of screening, since many patients were screened with the FOBT in the primary care office and did not need an outside referral unless the test’s findings required it. Without the intervention, HTPN referral rates increased from the baseline of 42% to nearly 68%. In slightly more than 40% of screened patients, screening results led to further treatment or follow-up. Nearly half of these high-risk patients would have been missed without the proposed intervention. Colonoscopies increased by nearly 120 to a total of 223 during the 3-month trial period.

Aside from the obvious added value to patient care and quality of life due to early detection and treatment of colorectal cancer, the results of this study suggest that this protocol is cost-effective and generates significant financial incentives to encourage increased screening and early detection. For example, the average net income to the gastroenterologist for a colonoscopy is $430. This translates to $95,890 in revenue for the 3-month study, an estimated increase of $51,600. The hospital receives a reimbursement of $463.66 for a colonoscopy. Over the 3-month trial study, this produced $97,368 in revenue, an estimated increase of $55,639. Pathology revenues (assuming the lowest reimbursement rate from Medicare of $98) during the trial period totaled $22,148, a commensurate increase of $11,760.

LESSONS LEARNED AND NEXT STEPS

Baylor Health Care System is committed to continuous improvement in the quality of health care delivered to its patients. This colorectal screening and referral protocol is one example of Baylor’s dedication to finding patient-friendly and cost-efficient ways to enhance health care in North Texas (29).

The screening protocol succeeded in its 3-month trial because it was collaborative, opportunistic, simple, and made good business sense. Rather than rely upon just one person in the chain to initiate colorectal cancer screening, the new procedure involves everyone in the process. Such a team effort minimizes errors of omission and provides continuous reminders, support, and encouragement for the patient to undergo the screening and to follow up with the results. This protocol is not dependent upon a scheduled annual physical or a visit related to preventive services. Instead, it takes advantage of any patient visit to recommend colorectal cancer screening if appropriate. As patients make fewer trips to the doctor for routine checkups, opportunistic preventive procedures may be the wave of the future. This protocol is easy to assess and easy to implement. It involves simple administrative tools that connect the many different steps in the referral and screening process and can be applied without expensive equipment, time-consuming training, and labor-intensive execution. Finally, it is cost-effective, using low-cost tools to generate additional revenues through increased screening procedures. The protocol is now being implemented in other parts of HTPN.

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Invited commentary

Preventing colon cancer: looking over the horizon

In this issue of BUMC Proceedings, Dr. Stroud reports a multidisciplinary health care improvement initiative that evaluated how well one primary care clinic carried out its objective in screening for colorectal cancer. Improvements in public health and quality of life in the Western world led to dramatic prolongations in life expectancy during the 20th century in association with an alteration in the nature of disease and death. Our concerns have shifted from managing the acute effects of infectious disease (with the periodic eruptions of diseases such as severe acute respiratory syndrome notwithstanding) to managing the inexorable impact of chronic diseases of aging such as heart disease and cancer in our lives. As a consequence, our role as physicians has increasingly evolved into the primary and secondary prevention of the occurrence and consequences of chronic disease. At this time, approximately 5% of the population will develop colorectal cancer during their lifetime; this proportion may increase as the mortality rates from other diseases such as cardiovascular disease are better controlled, since the incidence of colorectal cancer increases exponentially with age. One of the cruel ironies of improving health care is that we in-}

crease the proportion of the population that is aging and expose a larger number of people to diseases that are increasingly difficult to prevent or manage.

Colorectal cancer is one disease in which intervention is particularly able to alter outcome. Late-stage colon cancer is rarely curable; the earliest stages of colorectal cancer are almost always curable. Early detection of the disease has a dramatic impact on the quality and duration of life. Furthermore, screening leads to the removal of adenomatous polyps, the premalignant lesion, and actually reduces the incidence of cancer. Thus, this is one area in which screening measures have an impact on the quality of life of a population.

One would like to find an intervention that would be safe, efficacious, and acceptable to patients. At this time, multiple approaches are available to screen for colorectal cancer (1). The panel of tests includes the fecal occult blood test (FOBT), sigmoidoscopy, barium enema, and colonoscopy. The intent of the health care improvement initiative was to ensure that any type of screening was undertaken; it did not attempt to evaluate the efficacy of any particular method. As pointed out in the article, patient fear, lack of understanding of the tests, and embarrassment all conspire to lead to poor screening compliance. For reasons deeply imbedded in our culture, patients and physicians tend to avoid discussions of bowel function and, generally, patients will do what they can to avoid the interventions necessary to prevent colorectal cancer, even to the detriment of their health. Dr. Stroud and her colleagues have demonstrated that their efforts sharply increased screening from <50% to 86%. All data would suggest that a health benefit is achieved with this. The performance characteristics of the various types of screening tests have recently been reviewed (2). The FOBT would appear to be the simplest and cheapest test, but it has some practical shortcomings. A single FOBT has a low sensitivity (in the range of 30% to 50%), and in order to achieve a 33% reduction in mortality, the test must be performed annually. The mortality reduction is only half this rate if screening is performed every other year. The clinical benefit of this approach is brief, as there is a relatively short window of opportunity when a neoplasm bleeds enough into the bowel to be detected while it is still at a curable stage.

Sigmoidoscopy and colonoscopy represent a marked increase in the level of intervention and thus require additional efforts on the part of the primary care physician to convince patients to undertake them; however, their benefits are substantially better. The current evidence suggests that sigmoidoscopy can reduce mortality from colorectal cancer by 70% to 80% in the area of the bowel that is examined. Unfortunately, sigmoidoscopy examines less than half of the colon. It is assumed that colonoscopy detects about 90% of adenomatous polyps and nearly all colorectal cancers; however, this procedure requires an extensive preparation and entails some risks. The best news about screening sigmoidoscopy is that the reduction in mortality is not only robust, but the benefits last for at least 10 years in individuals with a negative exam. Similar data are not available for colonoscopy; however, the difference between colonoscopy and sigmoidoscopy is simply the extent of exam, and it is reasonable to expect a very high level of benefit from colonoscopic screening and removal of all adenomatous polyps.

The double-contrast barium enema was historically used to screen for colorectal cancer. However, there has been no prospective study of its impact on reducing cancer mortality, and it is clearly insensitive for the detection of small polyps. A positive test never leads to the removal of a polyp but simply triggers the referral for colonoscopy. Many observers have reasoned that it would be more useful to begin with an endoscopic procedure, either sigmoidoscopy or colonoscopy, rather than to start with an FOBT or a barium enema, both of which are screening procedures for the definitive test, a colonoscopy. Moreover, some have likened the performance of sigmoidoscopy, which examines only the distal half of the colon, to performing mammography on only one breast, the same side, repeatedly (3).

What will the future bring? Many efforts are under way to identify screening tests that are more powerful, more acceptable, faster, and cheaper. Abdominal computed tomography (CT) scanning of individuals with a prepped colon that is filled with gas (so-called “virtual colonoscopy”) is currently being evaluated as an alternative screening test. The benefit of this test is that the individual would not need to undergo instrumentation of the colon, and the risks of conscious sedation and possible perforation of the colon can be avoided. However, the patient must undergo the same bowel-cleansing preparation as for colonoscopy, and if there is a positive test, he or she must undergo colonoscopy anyway. At present, approximately 15% of these CT-colonography tests provide false-positive results, which means that the patient must undergo 2 preparations and still have a colonoscopy. The CT approach also will not detect most small polyps. It is unclear whether that is a drawback or a benefit, since many of these tiny lesions can safely be ignored. This technology is rapidly advancing, and one would hope that eventually the CT test could be made highly sensitive, so that most patients who have no neoplasms in their colon could avoid an invasive test. Another new approach currently under investigation is magnetic resonance imaging colonography, but this modality is not likely to be cost-effective. Time will tell.

Secondly, stool-based genetic tests are under development. With this approach, a stool specimen is sent to a reference laboratory and DNA is extracted and tested for mutated genes specific for cancer. The test appears to detect about 66% of colorectal cancers and a similar proportion of large adenomas. A small proportion of patients (<10%) have a false-positive test. A number of controlled trials are under way to test the value of this approach. It represents the evolving technologies that have followed on the heels of the molecular biology revolution that began approximately 20 years ago.

What have we learned from Dr. Stroud’s multidisciplinary health care improvement initiative? First, by increasing the awareness of physicians and patients about the potential benefits of screening for colorectal cancer, the disinterest, fear, and misinformation that currently plague the field can be overcome. Interestingly, when the first attempts were made to screen populations with the FOBT in England, compliance rates were about 37%, despite the use of mass media to alert the public of free testing. The public has also come a long way. It is now commonplace to hear educated persons discussing their recent colonoscopic experiences. Second, by having primary care physicians lead the initiative, the compliance rates were raised to 86%, which is extraordinary and will save lives.

Twenty-first-century medicine will require us to take positive steps to bring high-quality care to our patients. We can no longer remain complacent that we are doing our jobs by waiting for our patients to bring their complaints to us. It is very costly in human terms to treat an advanced colorectal cancer, whereas it can take only 20 to 30 minutes to remove a malignant polyp through the colonoscope. One can anticipate the evolution of new techniques that will be more acceptable to patients and will be associated with increased efficacy at lower cost.

These technologies need to be evaluated in the full context of their costs. Tests such as the FOBT, barium enema, and CT-colonography are true screening tests, since they lead to the performance of a definitive test (i.e., colonoscopy) when they are positive. Careful analysis of the costs and benefits of going directly to screening colonoscopy at age 50, followed by a rational plan of follow-up in those who either have no lesions in their colon or who have had small polyps removed, may be more cost-effective when the global costs are considered (4). One of the major hurdles to acceptance of colonoscopy or other screening modalities in asymptomatic patients remains the preparation. Currently, little progress is being made in the development of a pleasant, safe way to clean the colon. The bottom line, if you will, is that we should no longer assume that our patients will be persistently noncompliant with regard to colorectal cancer screening. Clearly, the inspired physician can make a difference.

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Invited commentary

Improving colorectal cancer screening through clinical systems redesign

The chronic care model has been proposed as an alternative framework to improve the delivery of both chronic disease management and preventive services by providing evidence-based, population-based, patient-centered care (1).

The interactions between patients and clinicians that are required for improving the delivery of preventive services are similar to those required for improving the management of chronic diseases. In the chronic care model, “productive interactions” lead to patients receiving interventions that are effective and patients and families receiving the information, behavioral support, and continuity of care that they need. Before these interactions can be productive, however, patients must be informed and “activated.” That is, they must be able to manage their health confidently and know how to use the health care system. Similarly, clinicians and their practice teams must be prepared and “proactive.” That is, they must have the information, resources, and time to provide interventions that are effective (1, 2).

The model is divided into community and health system interventions because social-environmental factors influence lifestyle. Community interventions include the use of resources to remove barriers that prevent members of the community from receiving preventive care and to influence the long-term success of preventive care programs by changing social-environmental factors. Health system interventions include several elements: 1) “self-management support,” helping patients understand that their participation is crucial in establishing attainable, worthwhile goals; 2) clinical information systems, which give members of the practice team access to patient-specific information; 3) “decision support,” or relevant clinical knowledge; 4) “delivery system design,” since a practice team must work within a system that is designed to improve, for example, the appointment system and the mechanisms for ensuring continuity of care; and 5) the support of the health care organization’s leadership (1, 2).

In the present study, Stroud and colleagues successfully utilized the principles of total quality management and the chronic care model framework to improve the colon cancer screening rates in their 8-physician group from 47% to 86%. They deserve to be commended for their efforts. As part of a plan, do, study, act cycle, they assessed data to identify opportunities for improvement, organized a multidisciplinary team, and reorganized their clinical practice to facilitate delivery of adult preventive services. Their success can be attributed not only to the vigor of a physician champion but also to their willingness to utilize health system interventions consisting of self-management support, decision support, delivery system redesign, and leadership support.

Similar approaches can be utilized to improve the delivery of all adult preventive services. When the first author was practicing at Austin Medical Center-Mayo Health System in Austin, Minnesota, his group was able to deliver 94% of all eligible adult preventive services—namely, colorectal, breast, and cervical cancer screening; pneumococcal, influenza, and diphtheria-tetanus vaccinations; lipid and hypertension screening; and tobacco use screening and cessation advice—for a community of 22,000 patients (2).

Improving the delivery of preventive services is not only beneficial to the patients but can also be financially rewarding to the providers and health systems, as noted by Stroud and colleagues. We too have reported that even busy physicians can deliver high rates of eligible preventive services if they utilize protocols and involve their office staff in the assessment and delivery of adult preventive services (3).

Dr. Donald Berwick recently wrote of disseminating innovations in health care (4). He observed that even when an evidence-based innovation is implemented in one part of the hospital or clinic, it may spread slowly or not at all to other parts of the organization. Clearly, the challenge in front of Dr. Stroud and all of us is to disseminate our effective intervention strategies so that all Americans can receive all of the preventive services recommended by the US Preventive Services Task Force. Achieving that goal would create a win-win situation for all of us.

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