Eliminating In-Hospital Fecal Occult Blood Testing: Our Experience with Disinvestment

The fecal occult blood test has an unimpeachable role in population-wide colorectal cancer screening. More than 5 decades ago, soon after commercial availability of the test, its use was extended for workup of altered stool color (example, melena) or anemia. Although this practice was debatable even then, current imaging and endoscopic tools have revolutionized our approach, rendering the fecal occult blood test irrelevant to modern hospital practice. Yet the routine use of fecal occult blood tests in hospitalized patients has persisted, sometimes reflexively with rectal examinations. Fecal occult blood tests are of 2 types: guaiac-based tests measuring heme, and immunochemical tests measuring globin. They are used to detect the microscopic presence of hemoglobin in stool but are plagued by poor accuracy. False-positive results can occur with nongastrointestinal bleeding sources (epistaxis, swallowed hemoptysis), mucosal inflammation without bleeding (inflammatory bowel disease), certain foods (vegetables containing peroxidase, and meats), toxins (such as alcohol), or clinically insignificant bleeding caused by anti-inflammatory drugs. False-negative results, such as those caused by slow or intermittent bleeding, ingestion of antioxidants such as vitamin C, or upper gastrointestinal bleeding in which globin is denatured, preclude their ability to convincingly rule out important pathology. Multiple samples need to be sent for increased sensitivity, and visual misinterpretation of results can occur. Inappropriate testing and interpretation not only leads to increased costs of testing but can lead to patient harm through incorrect downstream management decisions and unnecessary interventions. Studies have questioned the utility of having fecal occult blood tests available as an orderable test in the inpatient setting.

Therefore, we aimed to determine the use of fecal occult blood tests at the Parkland Health and Hospital System, an 870-bed safety net hospital in Dallas, Texas. Using these data, and with support from multidisciplinary stakeholders, we implemented stepwise interventions to abandon the use of fecal occult blood tests at our hospital.

METHODS AND RESULTS

In 2015 we performed a retrospective review of medical records from January 1, 2011 to December 31, 2014 to determine the number of fecal occult blood tests performed on patients in the emergency room and on inpatients (collectively termed in-hospital use). Fecal occult blood tests could be performed as a point-of-care test or in the laboratory. Additionally, we reviewed the medical records of 400 randomly selected patients with a positive fecal occult blood test result to determine the indication for testing.

Over the initial 4-year period, a total of 31,790 fecal occult blood tests were performed in the hospital (mean 7948 tests per year) (Figure). A majority were performed in the emergency room (71%, vs 29% inpatient) and as a point-of-care test (76%, vs 24% in the laboratory). Overall, 17% of fecal occult blood test results were positive. The indications for testing in the 400 randomly selected patients with positive fecal occult blood test results were as follows: history of dark stools 132 (33%), anemia 96 (24%), overt gastrointestinal bleeding 48 (12%), nonbloody diarrhea 23 (6%), colon cancer screening 2 (0.5%), and unknown 99 (25%). When indications were unknown, 82 (82%) were sent reflexively after a digital rectal examination. Of the patients with anemia, only 36 (38%) had supportive laboratory evidence of iron deficiency (low mean corpuscular volume or low iron and ferritin levels) at the time of fecal occult blood test. In all 400 instances, the use of fecal occult blood testing was not evidence based or recommended by guidelines. The laboratory cost of fecal occult blood testing to the hospital was approximately $5 per test, leading to direct testing costs of approximately $40,000 per year alone.

In early 2015, when these results were reviewed, an educational campaign regarding the appropriate use of fecal occult blood tests was launched. Hospital-wide periodic discussions were held among a multi-departmental team including members from internal medicine, the emergency department, surgery, pathology, laboratory services, and leadership. This resulted in 2-minute announcements once per week before
the noon conference for house staff, and weekly e-mails regarding the appropriate use of fecal occult blood tests were sent, over a 2-month period. House staff interested in gastroenterology gave a couple of hour-long noon lectures on the appropriate use of fecal occult blood tests. Every time the gastroenterology service was consulted with the results of a fecal occult blood test, the gastroenterology fellow and attending physician contacted the ordering provider regarding the correct interpretation and use of the test. The impact of this intervention on fecal occult blood test ordering rates was monitored, and a slight decrease in ordering was noted in 2015 and early 2016 compared with a baseline of 4 years prior (Figure).

Although we observed a reduction in testing, we were unsatisfied with these results. We debated among ourselves and eventually proposed complete elimination of fecal occult blood tests for hospitalized patients. Disinvestment or de-adoption of a medical practice is a heavily understudied discipline and has proven to be exceptionally difficult, even when clear evidence exists supporting disinvestment. Keeping this in mind, we adhered to the following principles while seeking support and presenting this initiative throughout the hospital.

Focus on Direct Medical Harm Rather Than Just Cost Saving

The first step was gathering and summarizing data on the futility of fecal occult blood tests and how patients experienced direct harm. Change introduced with the primary intention of saving costs can be viewed by physicians with suspicion, lest it negatively impact the quality of care. We appealed to the nonmaleficence of physicians by collecting data on patients in the hospital who did not receive an urgent colonoscopy owing to a false-negative fecal occult blood test result and patients who received an unnecessary colonoscopy or upper endoscopy owing to a false-positive test result. We also presented data on how, in a majority of cases, the results of the test did not alter the management plan but delayed appropriate care.

Establish Consensus Internally (Within the Gastroenterology Department) Before Advertising This Initiative

We realized the need to present a unified face to the rest of the hospital. The initiative was initially presented to just the gastroenterology faculty, some of whom reacted with skepticism. Review of the published literature and the data at our hospital helped the discussions, and eventually all faculty agreed that there was no utility of the test for hospitalized patients. We were then ready to present this to the rest of the hospital.

Phenomenon of “Defer to the Experts”

The emergency medicine, internal medicine (including hospitalist), and surgery services, who form a bulk of our hospital’s practice, were happy to let go of the test because the gastroenterology service (experts in the field) were the ones recommending this change. Furthermore, the feedback we received was that sometimes the test was ordered with the belief that gastroenterologists would want the test. We believe having a senior gastroenterologist as the team leader, who would personally go and present this proposal at the multi-departmental laboratory utilization committee meeting, was critical in being able to engage and convince people of the futility of this test. We believe that trying to effect change from the outside—for example, internal medicine physicians trying to change
a primarily gastroenterology practice—would in contrast be more difficult.

**Building Support**

We realized it was important to engage and get support from several stakeholders—not just the people who order the test but also those who perform it. Thus, we also spoke with the nursing staff, who sometimes performed the test as part of their standing orders, and with oncologists, who were sometimes consulted for a positive fecal occult blood test result (incorrect method of colon cancer screening after a rectal examination). This initiative was supported by both nurses and oncologists.

**Top–Down Approach (vs Bottom–Up Approach)**

The focus of Choosing Wisely and other such initiatives has been on change originating at the grassroots level, with trainees and frontline clinicians leading change based on recommendations from medical societies. Although admirable and encouraging, the impact of these initiatives has been modest.10,12 We engaged the hospital leadership early and presented the patient harm that was caused by continuing the test and the potential cost savings to the hospital if the test was abolished. We found that informed, educated directives coming from the “top” to individual departmental leadership were helpful to our cause.

Over 6 months, with continuous discussion, we could garner enough support for the Medical Executive Committee, consisting of physician leaders from different departments, to agree to abolish the test. Fecal occult blood tests were removed as an orderable test from the inpatient computerized provider order entry system in November 2016. Fecal occult blood test use immediately decreased by 98% (Figure), although minimal use persists because a few divisions acquire their own point-of-care kits for select cases.

**DISCUSSION**

Disinvestment or de-adoption is the processes of withdrawing certain healthcare resources (practices, medications, procedures, technologies) that deliver little or no gain relative to their cost.13 Eliminating an unnecessary clinical test is the holy grail of disinvestment. Unfortunately, despite overwhelming evidence, de-adoption continues to be a vexing problem internationally.14 Some of the challenges are policy driven; Elshaug et al.15 have compiled key challenges in disinvesting low-value care practices. These include lack of dedicated resources to build and support disinvestment policy mechanisms; lack of reliable administrative mechanisms to identify and prioritize practices with uncertainty regarding their effectiveness; political, clinical, and social challenges to removing an established technology; lack of published studies that clearly demonstrate that existing technologies/practices provide little or no benefit; and inadequate resources to support a research agenda to advance disinvestment methods.

Changing established low-value hospital practices is difficult, and different approaches, including education, peer review, and feedback have been attempted. However, as shown in our study, these approaches by themselves are insufficient to significantly and consistently modify ingrained ordering practices. Contributing to this difficulty are the facts that research in this area is poorly coordinated, without a common language, and devoid of a conceptual framework.15 We hope that our approach can inspire and help other institutions to take up this challenge until a more robust and widely applicable framework for disinvestment is developed.

We can place our interventions and results in the context of the elegant behavior system framework developed by Michie et al.16 In this behavioral change wheel, capability, opportunity, and motivation interact to generate behavior ("COM-B" system). This forms the hub around which are positioned a total of 9 possible intervention functions affecting 1 or more of these conditions; around which are placed 7 categories of policy that could enable those interventions. Capability is having the necessary knowledge and skills to engage in the activity concerned. Opportunity includes all factors outside the individual that allow or prompt a behavior. Motivation is the brain process that energizes and directs behavior, beyond goals and conscious decision making, including habit, emotional responding, and analytical decision making. Capability and opportunity influence motivation, and all 3 individually interact bidirectionally with behavior. Education and restriction are 2 of the 9 possible interventions around the COM-B hub. Our initial initiative (education) likely affected the capability (psychological) and the motivation of providers. This influenced their behavior of fecal occult blood testing, resulting in the 16% reduction in ordering that we observed. However, our educational initiative had limited impact owing to its relatively limited scope and the unaffected opportunity to obtain the test. Abolishing the test (restriction) denied clinicians the opportunity to order the test. Restriction and education together hit all 3 variables of the COM-B system that influence ultimate behavior, leading to a successful change in practice.

Our study confirmed the reasons for inappropriate use of fecal occult blood tests. Similar to other studies, we show that fecal occult blood tests in hospitalized patients are often obtained to evaluate dark-colored stools (suspected melena), anemia, diarrhea, or routinely during rectal examinations.17 However, almost all tests are unnecessary because results are irrelevant to the next steps of care. The use of fecal occult blood tests in patients with overt gastrointestinal bleeding, or its routine use after a rectal examination, demonstrate its largely perforcurtory nature. Melena or black tarry stools indicates bleeding from the upper gastrointestinal tract and is a clinical diagnosis based on visual inspection of stools; fecal occult blood tests may in fact confound the diagnosis. Similarly, the workup of iron deficiency anemia without overt gastrointestinal bleeding and without another clear source of blood loss is gastrointestinal endoscopy, irrespective of fecal occult blood test results. Blood loss may be intermittent, and a negative test does not rule out gastrointestinal blood loss. If anemia is not iron deficient, chronic gastrointestinal blood
loss is less likely, and other reasons for anemia should be considered. Indeed, more than half the patients with anemia who underwent fecal blood tests in our study did not have laboratory evidence of iron deficiency at the time of the testing. A positive fecal occult blood test result in the setting of non-iron deficiency anemia should not immediately prompt endoscopy. In one study only one-third of hospitalized patients with a positive fecal occult blood result test underwent further gastrointestinal testing, and a majority of them underwent an endoscopy even before testing resulted. Physicians may feel compelled to perform endoscopy to evaluate a positive fecal occult blood test result even if they believed endoscopy would be low-yield.

When sufficient medical evidence exists, modifying the “opportunity” to order a test, such as elimination or restriction, along with education and support from hospital leadership, becomes necessary. We provide our experience with de-adopting inpatient use of fecal occult blood tests. It has been more than 17 years since studies confirmed the futility of in-hospital fecal occult blood tests and initiated its long demise. We have waited long enough. It is time to write the obituary for in-hospital fecal occult blood tests.

References


