



# Statewide Capacity for Colorectal Cancer Screening Final Report



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**South Dakota Department of Health**  
Comprehensive Cancer Control Program  
615 E. Fourth Street  
Pierre, SD 57501

## **PREPARED BY:**

**Rebecca Randall, EdD, RN**  
Assistant Dean and Assistant Professor of Undergraduate Nursing  
**Amanda Mitchell, MS**  
Grants and Project Coordinator  
**Jennifer Kerkvliet, MA, LPC**  
Health Research Coordinator  
**Nancy Fahrenwald, PhD, RN, APHN-BC**  
Associate Dean of Research and Professor



South Dakota State University  
College of Nursing  
Box 2275  
Brookings, SD 57007  
605.688.4098

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# Executive Summary

## Statewide Capacity for Colorectal Cancer Screening

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### Project Purpose

The purpose of this study was to replicate components of a national study of colorectal cancer (CRC) screening capacity in order to evaluate the state of South Dakota's current CRC screening practices and capacity indicators.

### Methods

The sample included all healthcare facilities in the state of SD that potentially offered any type of CRC screening. After screening for eligibility and completion of initial contact, a total of 179 facilities agreed to complete the survey and 87 surveys were returned (48.6% response). For this study, the project partners created a modified version of the survey used to measure CRC screening capacity in the national study.

### Results

Most of the 87 facilities that participated in the study were family practice clinics ( $n=47$ ) and federally qualified health centers ( $n=11$ ). Many facilities (64%) reported participation in the "GetScreenedSD" CRC screening program. Nearly two-thirds offered the guaiac testing of a digital rectal exam (DRE) specimen (63%) and/or a guaiac-based 3-card fecal occult blood test ([gFOBT], 62%). Fecal immunochemical testing (FIT/iFOBT) was offered by 51% of facilities. Flexible sigmoidoscopy was performed by 19% of facilities and 32% of facilities performed colonoscopies. The most frequently reported CRC screening procedure was the colonoscopy (56%) followed by a guaiac test of a DRE specimen (25%).

Of the participating facilities, 5% had a written protocol or practice standards in place for CRC screening. Ten facilities had a system in place to distribute provider feedback on their rates of CRC screening. Overall facility adenoma detection rates (ADRs) were calculated by 33% of the 21 reporting facilities that performed colonoscopies. Provider-specific ADRs are calculated by 19% of these same 21 facilities. Most facilities (71%) indicated that quality measures were not reported to a quality registry.

### Priority Recommendations with further details in the Report:

1. Educate healthcare providers in the state of South Dakota about current clinical practice guidelines for CRC.
  - Screening tests for CRC that follow the guidelines.
  - Screening tests that do not follow the current CRC screening guidelines.
  - Available resources to assist with CRC screening cost barriers.
2. Develop CRC screening protocols and educational resources for healthcare facilities and providers. Disseminate these resources as part of a CRC screening tool kit.
3. Educate the people of SD on the importance of CRC screening and screening options using population-based media and other innovative approaches that reach large numbers of age-eligible community members.
4. Educate healthcare providers and systems about colonoscopy quality measures in an effort to increase participation in these initiatives.

# Statewide Capacity for Colorectal Cancer Screening

## Introduction

### Background and Significance

According to the United States (US) Centers for Disease Control and Prevention (CDC), colorectal cancer (CRC) is the second leading cause of all cancer deaths, and it is the leading cause of cancer death among non-smokers (CDC, 2010a). Many CRC deaths could be prevented through early detection. According to the *US Preventive Services Guidelines* (2008, 2009), CRC screening is recommended for adults aged 50 to 75 years. Despite a range of CRC screening options, at least one-third of eligible adults do not meet current screening guidelines (CDC, 2010b). A recent meta-synthesis identified that rural populations experience disparities across the cancer care continuum when compared to urban populations (Palmer & Schneider, 2005). According to these authors, rural dwellers participate in screening less frequently and have higher mortality from CRC than their urban counterparts. Access to services is a well-known barrier to healthcare, and is an important component of improving CRC screening rates, especially in rural states like South Dakota (SD).

### Purpose

A nationwide study of capacity to conduct CRC screening, called Survey of Endoscopic Capacity-2 (SECAP2), is underway in 13 states, one tribal organization, and one US territory (CDC, 2012). The SECAP2 study is modeled after an earlier CDC-initiated SECAP study that evaluated endoscopic screening capacity for CRC (Seeff, et al., 2004), but was based on capacity to implement screening and follow-up guidelines that were in place prior to the current *US Preventive Services Guidelines* (2008, 2009). The state of SD is not included in the national SECAP2 survey; however, statewide partners identified an urgent need to establish a baseline estimate of capacity for CRC screening. The purpose of this study was to replicate components of the SECAP2 study protocol in order to evaluate the state's current CRC screening practices and capacity. The results of this statewide study will be used to identify deficits in the current CRC screening infrastructure, as well as to provide vital baseline information for use in planning initiatives aimed at increasing CRC screening. The long-term goal of the SD partners is to plan for service enhancement, healthcare provider education, and policy development to assure that all eligible residents are screened for CRC.

## Methods

### Design and Sample

This study used a participatory research approach and a descriptive survey research method. Community partners included the SD Department of Health (SD DOH), the Colorectal Cancer Workgroup within the SD Comprehensive Cancer Control Program (SD CCCP), the SD Council on Colorectal Cancer, Saint Mary's Foundation, and South Dakota State University (SDSU). Partners collaborated to design the study, develop the modified protocol and survey, and plan for dissemination of findings. Institutional Review Board approval was obtained from SDSU.

The sample included all healthcare facilities in the state of SD that potentially offered any type of CRC screening. The healthcare facility list was compiled from SD DOH resources, including the provider list from the “Get Screened SD” program (focused on colorectal cancer screening), the registered or certified health or allied health services database, and the state vaccine registry (SD DOH, 2013a,b,c). The study excluded all Indian Health Service (IHS) and Tribal Health facilities because of a concurrent project led by the American Indian Cancer Research Foundation (2013) involving 54 IHS/Tribal Health facilities located throughout the Northern Plains region of the US.

After removal of duplicates from the three SD DOH resources, there were 747 healthcare facilities remaining on the compiled list. An additional 58 facilities were identified as ineligible prior to any telephone contact, leaving 689 facilities on the list. Ineligibility was due to the following factors: (a) location outside of SD, (b) facility closed, (c) facility did not provide health services (e.g., dictation service or medical laboratories), or (d) facility was an IHS or Tribal Health service site. After initial contact, an additional 310 facilities were screened as ineligible due to no CRC screening procedures or tests provided at the facility. Of the remaining 379 facilities, 140 were not reached after multiple contacts. An additional 8 facilities were closed and 52 facilities were eligible but declined the invitation to participate in the study. A total of 179 facilities agreed to complete the survey and 87 surveys were returned (48.6% response).

## **Instrument**

The project partners created a modified version of the SECAP2 instrument to measure CRC screening capacity in this study (CDC, 2012). The existing instrument was designed to measure quality and capacity for endoscopic procedures in the US. The project partners added questions regarding the use of fecal occult blood testing (gFOBT) and fecal immunochemical testing (FIT/iFOBT). The survey is included in Appendix A.

## **Protocol**

Initial data collection involved a telephone survey and follow-up emails to administrators of healthcare facilities. Administrators were informed about the project and were invited to participate. Healthcare facilities were contacted multiple times via phone and email. Research assistants who conducted the telephone surveys were trained in telephone data collection methods including handling difficult calls, soft conversions, and data entry procedures. To assure that consistent information was requested, all calls and emails were scripted.

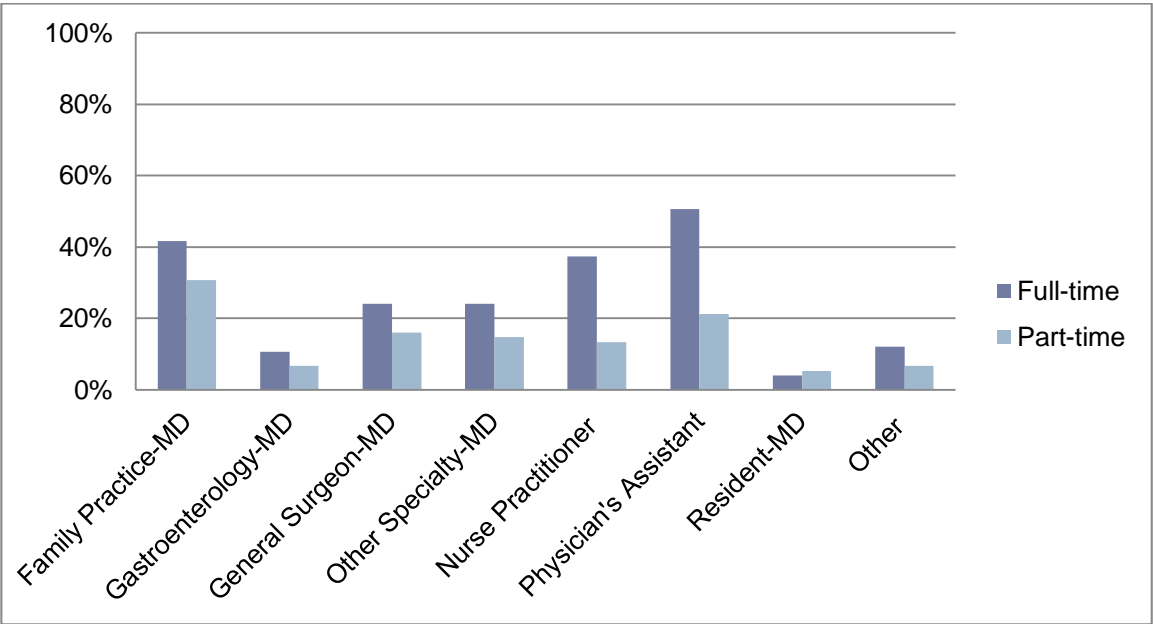
Facility administrators who agreed to participate were mailed the survey, which was returned in a postage-paid envelope. Data entry and analysis were completed using *IBM Statistical Package for the Social Sciences* Version 21.0 (2013). Healthcare facility identifiers were not linked to the dataset. Data were double-entered, verified, and stored on a secure, password-protected server.

Facility  
Characteristics

Results

The majority of the 87 facilities that participated in the study were family practice clinics ( $n=47$ , 54%), federally qualified health centers ( $n=11$ , 13%), and other ( $n=14$ , 16%). A wide range of other practice sites, including general surgery clinics, family medical residency programs, and multi-specialty clinics also participated. Of these facilities, 64% reported participation in the “GetScreenedSD” CRC screening program. Facilities were staffed by a variety of providers who performed or referred CRC screening services for patients (Figure 1). Most facilities employed full time physician assistants (51%), family practice physicians (42%), and nurse practitioners (37%). Other staff included internal medicine specialists, locum providers, and specialists (Figure 1). The availability of either a full- or part-time gastroenterologist was not common.

Figure 1. Types of Healthcare Providers who Perform CRC Screening in Facilities



Note: Medical Doctor (MD)

The majority of patients at practice sites were female (83%). Facilities reported the most frequent age categories of clients as 18-44 years (22%) and 65-80 years (22%). The facilities also reported that 15% of their patients were between the ages of 45-50 years and 18% of clients were 51-64 years of age. Patient population race/ethnicity estimates ranged from 25% to 100% White (non-Hispanic), with a mean of 81% White. Patient populations from other racial/ethnic groups were 12% American Indian, 3% Hispanic, 2% Black, and 1% Asian.

Reimbursement sources were reported as Medicare (35%), private insurance (32%), or Medicaid (18%). The facilities reported that nearly 10% of patients were uninsured, 2% were covered by the US Indian Health Service, and nearly 2% received reimbursement from the US Veteran’s Administration. Other types of

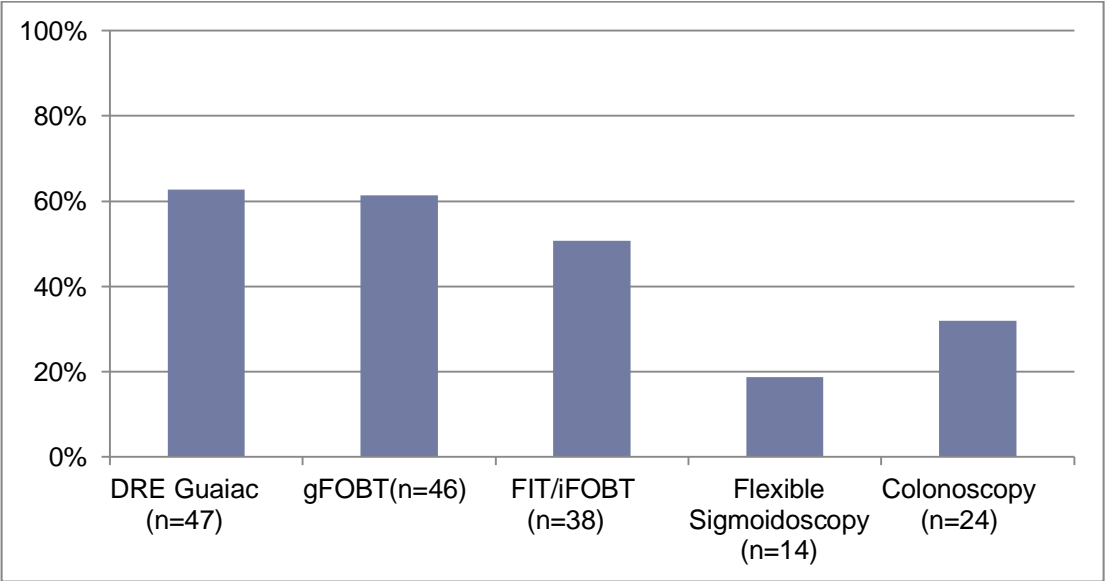
insurance (2%) included worker’s compensation and Tricare (i.e., active military service health benefits).

Most facilities had fully operational electronic medical record (EMR) systems ( $n=52$ , 60%), while others ( $n=20$ , 23%) were transitioning to EMR systems. Paper charts were still used in 9% of the facilities, while 8% used a combination of paper and EMR.

**Facility  
Screening  
Practices**

Respondents were asked what screening services were provided at their facilities. Nearly two-thirds of facilities offered the guaiac testing of a digital rectal exam (DRE) specimen (63%) and/or a guaiac-based 3-card fecal occult blood test ([gFOBT], 62%). Fecal immunochemical testing (FIT/iFOBT) was offered by 51% of facilities. Flexible sigmoidoscopy was performed by 19% of facilities and 32% of facilities performed colonoscopies (Figure 2).

**Figure 2. Types of CRC Screening Available at Participating Facilities ( $n=87$ )**

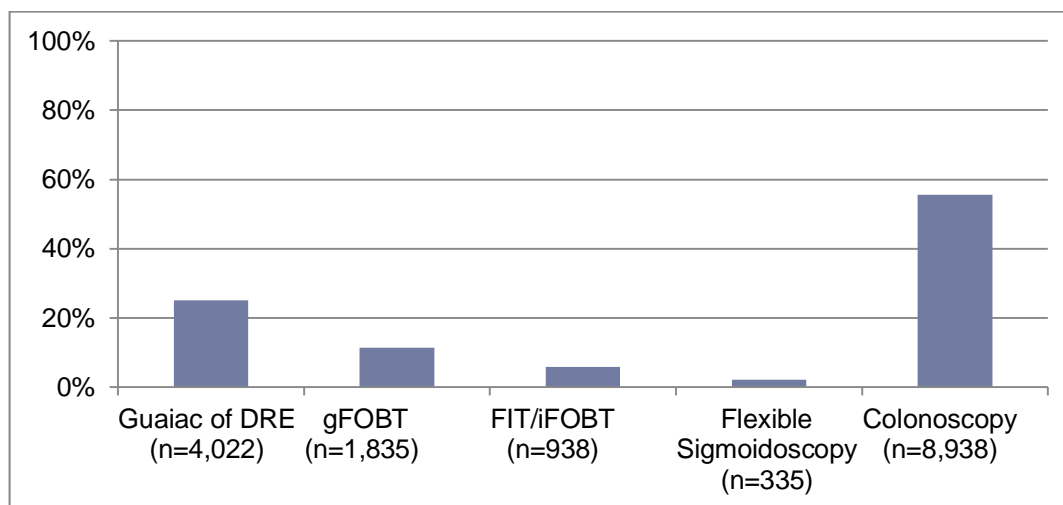


Nearly one-third (32%) of facilities offered three types of screening and 30% of facilities offered two types of screening. When three types of screening were offered, the most frequent types were DRE Guaiac, gFOBT, and FIT/iFOBT (39%). When two types of screening were offered, the most frequent types were DRE Guaiac and gFOBT (50%). Of the facilities that offered one type of screening (27%), 45% of those facilities offered FIT/iFOBT.

In 2011, the responding facilities performed a combined total of 16,068 CRC screening procedures (Figure 3). The most frequently reported CRC screening procedure was the colonoscopy (56%) followed by a guaiac test of a DRE specimen (25%).

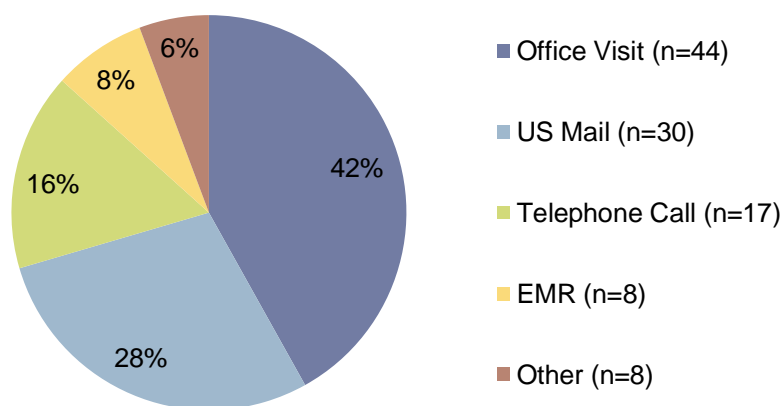


**Figure 3. 2011 CRC Screening Procedures Completed by Type (n=16,068)**



Nearly one-half (47%) of facilities reminded their patients about CRC screening eligibility (Figure 4). The most frequently used method of patient reminders was a verbal prompt during an office visit (42%). Thirty facilities (28%) used a reminder by mail, 16% used a telephone reminder, and 8% employed the EMR as a reminder tool. Other methods included reminders through scheduling staff, certified mail if no response after two standard mailings, and email or web-based reminders.

**Figure 4. Types of Patient Reminders about CRC Screening Eligibility**



All facilities reported mechanisms for provider notification of patient's eligibility for CRC screening. These mechanisms included: (a) a notation in the chart (27%), (b) a reminder in the EMR (24%), (c) a computer prompt (20%), and (d) other means (17%). The other means of provider notification included flow sheets, recall lists maintained by staff or nursing personnel, and chart review at the time of an appointment.

Facility respondents reported the percentages of different types of providers who performed endoscopic screening (colonoscopy or flexible sigmoidoscopy) or ordered guaiac or immunochemical-based screening tests (DRE/gFOBT, FIT/iFOBT)

in a typical week. Table 1 summarizes these findings, which are further explained under the following sections of the report.

**Table 1. Percentage of CRC Screenings Performed/Ordered by Healthcare Providers**

Healthcare Providers	Performed Screening Mean % ( <i>SEM</i> )		Ordered Screening Mean % ( <i>SEM</i> )	
	Colonoscopy	Flexible Sigmoidoscopy	DRE/gFOBT	FIT/iFOBT
Family/General Practice MD	20% (8.1)	39%(15.7)	37% (6.1)	36% (8.5)
Gastroenterologist	5% (5.3)	10% (10.0)	0	4% (4.3)
General Surgeon	71% (8.9)	45% (14.7)	5% (3.0)	4% (4.3)
Other Specialty MD	3% (2.3)	10% (10.0)	8% (3.8)	8% (5.8)
Nurse Practitioner CNP	0	0	12% (4.2)	21% (7.1)
Physician Assistant PA	0	0	34% (6.3)	25% (8.6)
MD Resident	0	0	4% (2.4)	7% (4.3)
Nurse (under MD, CNP or PA order)	0	0	95% (3.1)	0
<b>All Facilities (%)</b>	<b>28%</b>	<b>14%</b>	<b>61%</b>	<b>37%</b>

Note: Standard Error of the Mean = *SEM*; Medical Doctor = MD

### Colonoscopy Screening Practices

There were 24/87 (28%) of the facilities that performed colonoscopy screening on site. General surgeons were most commonly reported as performing the procedure (71%) followed by family and general practice medical doctors (20%). There were no sites that reported colonoscopy procedures performed by physician assistants, nurse practitioners, or medical residents (refer to Table 1, p. 5).

During a typical week, the range of colonoscopies performed was 2 to 85, with a mean of 21 colonoscopies per week. Sites that reported less frequent colonoscopy procedures reported monthly frequencies between 1 and 15 per month with a mean of six monthly procedures. Primary screening for CRC was the reason for 55% of colonoscopies (range = 10% to 90%). Colonoscopies were performed as a diagnostic procedure for a mean of 30% across reporting facilities (range = 5% to 80%). Colonoscopies were performed least frequently as a follow-up procedure (Table 2).

**Table 2. Reasons for Colonoscopy (n = 21)**

Reason for Colonoscopy	Mean ( <i>SEM</i> )
Primary Screen	55% (6.6)
Diagnostic Procedure	30% (4.9)
Follow-up	15% (3.6)
<b>Total Facilities</b>	<b>21</b>

## Capacity for Colonoscopy Service Expansion

Average room time scheduled for a colonoscopy ranged from 30 minutes (19%) to 180 minutes (5%). The most frequent response was 45 and 60 minutes (57%). The typical waiting time for a scheduled diagnostic colonoscopy, or a colonoscopy screening, was most frequently one to two weeks (85%). One facility reported a waiting time of one to two months.

Facilities were asked about factors that potentially limit the potential to expand the number of colonoscopy procedures performed at the site ( $n=21$ ). The most frequent limiting factors were the number of providers (38%), procedure rooms (38%), insufficient time (33%), nursing staff (24%), and patient preparation (24%). Also reported were the number of endoscopes (19%), availability of support staff (14%), and number of physicians (10%). One facility indicated that insufficient reimbursement was a limiting factor. Other limiting factors identified were patients going to other facilities and patient unwillingness to complete the procedure.

When sites were asked if more colonoscopies could be performed at the practice site with no other investment of resources, two-thirds (67%) of the participating sites indicated that if the demand were to increase, they could increase the number of colonoscopies performed with no other investment of resources. In total, these sites indicated that they could complete 17% more colonoscopies per week without investment in additional resources.

If the demand for colonoscopies were to exceed current capacity to perform colonoscopies, two-thirds (67%) of the facilities also indicated that they would increase or hire more non-physician endoscopists, 48% indicated that they would increase hours, and 29% indicated that would modify scheduling, or increase nursing staff. Three facilities (14%) indicated they would use patient navigators.

## Colonoscopy Completion

Over one-half (56%) of the reporting facilities that performed colonoscopy reported that the cecum could not be reached in 2% or fewer procedures. There were 35% of the reporting facilities that indicated that the cecum could not be reached 3% to 5% of the time. The most common reason given for incomplete colonoscopies was technical difficulties (48%). Poor bowel preparation was also reported as a reason for incomplete colonoscopies by 33% of the facilities. A concurrent study explored SD healthcare provider knowledge, practices, and beliefs related to CRC screening, and a section of the forthcoming report will identify the types of bowel preparation utilized by healthcare providers who order or perform colonoscopy procedures.

When a colonoscopy was incomplete due to poor bowel preparation, 48% of the facilities indicated that the colonoscopy would be repeated at a later date. A double contrast barium enema would be ordered by 29% of the other sites. Other approaches that providers would use included: consideration of all risk factors, fleets enema prior to procedure, more sedation, call anesthesia at the time, or reschedule the procedure to be completed under anesthesia.

### **Flexible Sigmoidoscopy Screening Practices**

Of the 87 participating healthcare facilities, 14% ( $n=12$ ) reported on flexible sigmoidoscopy as a CRC screening practice during a typical week. General surgeons perform a mean of 45% of these procedures and family practice doctors accounted for 39% of sigmoidoscopies. No sites identified that physician assistants, nurse practitioners, registered nurses, or residents performed flexible sigmoidoscopies (refer to Table 1, p. 5). Three facilities identified flexible sigmoidoscopy as the primary CRC screening procedure for 95% to 100% of screenings. During a typical week, the range of flexible sigmoidoscopies performed was 1 to 15 with a mean of 4.4 per week conducted. Sites that reported flexible sigmoidoscopies performed per month indicated that between 1 and 2 procedures were performed monthly.

### **Guaiaac of DRE and gFOBT Practices**

Of the 87 participating healthcare facilities, 53 (61%) reported that their providers ordered either a guaiaac of a digital rectal exam (DRE) or a take-home guaiaac fecal occult blood test (gFOBT) as a CRC screening procedure. There were 41 out of these 53 facilities that reported the number of guaiaac/DRE tests and home gFOBT tests ordered per week. The range was 1 to 20 guaiaac/DRE tests per week and 1 to 10 gFOBT per week.

The use of guaiaac/DRE and gFOBT tests for CRC screening was ordered most frequently by nurses under the orders of licensed MDs, PAs or CNPs (refer to Table 1, p. 5). Family practitioners and physician assistants also ordered this form of CRC screening more frequently than other types of healthcare providers who can directly order CRC screening. Gastroenterologists did not order DRE or gFOBT.

When asked to identify the factors that kept facilities from performing or ordering more guaiaac/DRE or gFOBT tests, participating facilities ( $n=53$ ) identified insufficient numbers of nursing staff (21%) and insufficient reimbursement (21%) as limiting factors. Other reasons were cited by 58% of reporting facilities. Open-ended statements about these other limiting factors included: DRE not recommended for CRC screening, most patients referred for colonoscopy, not as accurate as colonoscopy, patient non-compliance, switch to FIT/iFOBT, OB-GYN facility, and patient frailty.

When asked how gFOBT or DRE specimen tests were processed, responding facilities ( $n=53$ ) indicated that the majority (77%) of tests were processed on site. Other sites (15%) indicated the tests were mailed to a local laboratory or another processing site. These same facilities also indicated that 30% of gFBOT tests are never returned by the patient. Most sites (23%) improve their return rates by placing a reminder call. Re-ordering the test was used by 21% of facilities and 15% used other methods such as a letter, a patient portal message via the EMR, a reminder at next appointment, or the provider performed a guaiaac test of a DRE.

### **FIT/iFOBT Practices**

Of the 87 participating facilities, 37% indicated that they order the FIT/iFOBT as screening tests for CRC. The range of use for these tests varied from one per week (50%) to 12 per week (3%). Family or general practice physicians order FIT/iFOBT tests most frequently ([36%], refer to Table 1, p. 5). Nearly two-thirds (66%) of

FIT/iFOBT tests were processed on site and other tests were mailed or sent via courier to another laboratory or were processed at a local hospital.

Cancellation of appointments and no-shows were identified by 9% of facilities as limiting factors to ordering additional FIT/iFOBT screening tests. Insufficient reimbursement and lab processing were not identified as limiting factors. Other limiting factors were the most frequently cited and included open-ended statements such as: other testing is superior, poor patient compliance, provider preference, and staff, provider, and patient knowledge.

The reported range of FIT/iFOBT tests not returned was 0% to 100%, with a mean of 29%. The most frequently reported method to improve return rate was phone calls (56%), followed by re-ordering tests (22%). Other methods to improve return rates included letters, patient portal message via EMR, and check-in reminders.

## Quality Measures

Facilities were asked if they have their own written protocol or practice standard in place for CRC screening. Of the participating facilities, 5% had a written protocol or practice standards in place. Ten facilities (14%) had a system in place to distribute provider feedback on their rates of CRC screening and the remainder (86%) did not have a mechanism to provide feedback. Facilities were asked to report whether adenoma detection rates (ADRs) were calculated for the facility and for each provider. Overall facility ADRs were calculated by 33% of the 21 reporting facilities that performed colonoscopies. Provider-specific ADRs are calculated by 19% of these same 21 facilities.

Facilities ( $n=21$ ) were asked whether quality measures were reported to a centralized registry. These measures included cecal intubation rates or ADRs. A majority of facilities (71%) indicated that these rates were not reported to a quality registry. No facilities reported to the Clinical Outcomes Research Initiative (CORI) or the American Gastroenterological Association (AGA) Digestive Health Outcomes Registry. One agency reported to the Gastrointestinal Quality Improvement Consortium (GIQuIC). There were two facilities that indicated reporting to their own internal registry.

## Survey Comments

There were a number of informative comments by the survey participants. For example, one respondent indicated that approximately 15 years ago they were treating about 100 cases of colon cancer per year, but now only average two to four cases per year. This decrease in CRC prevalence was cited as primarily due to the increased use of colonoscopies at the site. Another facility acknowledged a desire to improve rates of screening for CRC.

One facility expressed a desire to increase the use of FIT/iFOBT if the cost would be lower and more comparable to the cost of gFOBT. Another clinic is evaluating a move to the FIT/iFOBT test. Two sites indicated that they are working to improve education for all staff, but that time is a barrier.

One facility discussed its lack of comprehensive follow-up and indicated that patient screening for CRC gets missed for this reason. Several sites indicated that their patient population is comprised mostly of clients who are not eligible for CRC screening. Another facility indicated that CRC screening is best managed by primary care providers. Concern was expressed by one facility about uninsured patients who are not able to afford the cost of screening.

## Discussion

The findings from this statewide survey demonstrate a need to educate all levels of healthcare providers on the currently recommended CRC screening practices. A notable finding was that 63% of participating facilities performed a guaiac test from a DRE specimen, which is not a recommended CRC screening procedure in the *US Preventive Services Guidelines* (2008, 2009). Although the survey does not provide conclusive information as to why these DRE screenings are offered, obvious factors such as cost, habit, simple convenience, and lack of insurance may contribute to persistent use of this screening test. Healthcare provider and health system education on the reasons to discontinue use of DRE screening is critically needed.

Over 60% of participating sites ordered 3-card FOBT tests for CRC screening. The 3-card gFOBT test is an acceptable CRC screening procedure, but there are barriers to implementation and completion of this test. The identified barrier of insufficient nursing staff (8%) to complete the patient education for more gFOBT screenings could be easily addressed with changes in staffing or clinic practices, but the barrier of insufficient reimbursement (8%) is more difficult. Many individual cost barriers are readily addressed through South Dakota's "GetScreenedSD" CRC screening program (SD DOH, 2013). An additional noted barrier to gFOBT is failure to return the complete screening card. Nearly 30% of the facilities reporting that the gFOBT tests were not returned by the patient. Approaches to improving return rates were varied, including use of follow-up telephone calls by 32% of facilities that use this test. The efficacy of this approach to increasing return of screening samples could be evaluated to further address this barrier. A recent literature review examined approaches to improving CRC screening and found that a variety of team-based intervention methods are most effective (Atassi, 2012).

The results from this study indicate that colonoscopies were performed primarily for screening (55%). General surgeons (71%) and general practice physicians (20%) performed the highest percentage of colonoscopies. The rate for surgeons in SD is higher than the national SECAP data and the SECAP data for the state of Colorado. National results identified that 11% of colonoscopies were completed by surgeons (Seeff, 2004), and the Colorado results were 10% (Manninen, Dong, and Wings, 2006). The SD survey identified that 5% of colonoscopies were performed by gastroenterologists, which is much lower than the original national SECAP data (43.7%). The higher percentages of general surgeons and general practice providers, who complete colonoscopies, could be related to the rural geography of the state and the lack of specialists in gastroenterology. This same issue could explain the low utilization of colonoscopy quality measures and reporting by participating facilities.



Overall adenoma detection rates (ADRs) were calculated by 33% ( $n=7$ ) of facilities that perform colonoscopy, and to a lesser degree by provider and provider by gender. There is a need to improve these quality measures. Several facilities indicated that they report to a quality registry, but did not indicate which registry.

Most facilities (68%) indicated that they could increase the number of colonoscopies with no additional investment of resources. Two-thirds of the facilities indicated that they would increase the number of hours or physician staff (50%) if there were an increased demand for colonoscopies. Facilities also indicated that their first approach to increase capacity would be to hire more non-physician endoscopists (48%) or increase hours (29%). No survey respondents employed non-physician endoscopists to perform colonoscopies at their facilities. Limoges-Gonzalez (2012) identified training of non-physician endoscopists as an option to increase access to colonoscopies. Obstacles to this approach are the access and cost of education and the potential limitations in reimbursement for non-physician providers.

Flexible sigmoidoscopy was performed by 19% of facilities on average of four times per week. A higher percentage of general practitioners (39%) performed sigmoidoscopies than the 2005 Colorado SECAP study ([18%], Manninen, Dong, & Winges, 2006) and the national SECP study ([25%],; Seeff et al., 2004). As with colonoscopies, no non-physician providers completed flexible sigmoidoscopies. The 2005 Colorado SECAP indicated that 42% of flexible sigmoidoscopies were performed by non-physician endoscopists and the national report was 6%. The use of non-physician endoscopists could increase the capacity for flexible sigmoidoscopies.

The FIT/iFOBT tests were offered at 38 of the 81 participating facilities, and accounted for 37% of the total CRC screening tests that were ordered. These tests were usually ordered by general practitioners. Participants indicated insufficient utilization of the test as a limiting factor and this low use is due to the need to educate providers about the FIT/iFOBT tests. Some facilities indicated that they would like to offer the FIT/iFOBT screening, but that cost was a factor. Healthcare providers need education on the use of FIT/iFOBT testing as an acceptable and more convenient way to potentially improve CRC screening completion rates. A recent study identified that mailing the FIT/iFOBT test to clients and following-up with an interactive voice call, resulted in a CRC screening rate that was four times higher than standard screening (Kemp, Shetterly, France, & Levin, 2012). Liles and colleagues (2012) reported that one sample FIT/iFOBT has greater sensitivity to detect from 25% to 69% of CRC cases, compared to three sample gFOBT which detects 12% to 38% of CRC cases.

## **Limitations**

Response rate is a limitation of this study. A total of 87 facilities returned the survey for a 49% response rate ( $n=87/179$ ). The response rate is lower than the response reported by Seeff and colleagues (2004) in the original SECAP study, which had a

74% response rate. Our study did not include a financial incentive for survey completers, while the SECAP study used a \$40 cash reimbursement. The need to exclude all IHS facilities due to a regional study currently underway is another methodological limitation. Access to screening for the American Indian population of the state of SD must consider the results of the American Indian Cancer Foundation study when they are published.

There are a variety of factors that contribute to low CRC screening rates. This study did not explore patient identified barriers to CRC screening. Technical problems contributed to incomplete colonoscopies, but the survey did not ask questions about training, maintenance of equipment, or equipment replacement costs. More information needs to be gathered to determine the types of technical problems that occur and staff education on equipment maintenance so that these challenges may be addressed.

## Conclusions

This study examined the current practices related to CRC screening in the state of SD. Participating facilities reported capacity to expand colonoscopy services; however, only 21 of the facilities offered colonoscopy on site. Access to colonoscopy services in this large rural state is probably limited by distance to a site that offers this service. The prevalence of up-to-date CRC screening among adults in SD was 64% in 2010 compared to a national estimate of 64.5% (Djenaba, King, Miller, & Richardson, 2012). These estimates were based on reports of colonoscopy within 10 years (60.9% for SD and 60.3% for US), gFOBT in the past year (11.7% for SD and 10.1% for the US), and sigmoidoscopy within 5 years with FOBT within 3 years (0.6% for SD and 1.3% for US). In the state of SD, there is unlimited capacity to offer the convenient home-based and single-specimen screenings (FIT/iFOBT) to meet and exceed *Healthy People 2020* goal of 70.5% of adults who are screened for CRC (US Department of Health and Human Services, 2013).

Facilities indicated a need for improved systems of implementing evidence based clinical practice guidelines, but stated that time, staff, and education are all limiting factors. Screening protocols for CRC would drive uniform practice, reduce staff time, and provide the impetus for facility, staff, and healthcare provider education. Use of tool kits designed to help clinicians consistently apply screening guidelines using a systematic approach is an evidence based strategy (Levy, Daly, Schmidt, & Xu, 2012; Spruce & Sanford, 2012). With time being a limiting factor for CRC screening, integrated approaches made available in convenient tool kits help providers to make efficient use of time. A CRC screening tool kit would provide convenient access to education and a standardized plan for facilities to improve CRC screening rates. The SD Comprehensive Cancer Control Program, CRC workgroup, could work to develop a kit that would include information on recommended screening guidelines, use of EMR to improve reminders to patients and providers, methods to improve return of tests, and ways to improve screening practices at facilities.



## **Recommendations**

1. Educate healthcare providers in the state of South Dakota about current clinical practice guidelines for CRC, specifically addressing:
  - Screening tests for CRC that follow the guidelines.
  - Screening tests that do not follow the current CRC screening guidelines.
  - Available resources to assist with CRC screening cost barriers.
2. Develop CRC screening protocols and educational resources for healthcare facilities and providers. Disseminate these resources as part of a CRC screening tool kit.
3. Educate the people of SD on the importance of CRC screening and screening options using population-based media and other innovative approaches that reach large numbers of age-eligible community members.
4. Educate healthcare providers and systems about colonoscopy quality measures in an effort to increase participation in these initiatives.

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## Appendix A

# Survey of Colorectal Cancer Screening Capacity in South Dakota

Thank you for agreeing to participate in this project. This survey is estimated to take 20 minutes to complete. Your responses are very important to us. If you are unable to respond to a specific question, please feel free to consult with other professionals at this practice site. If you have any questions about this survey, feel free to contact Amanda Mitchell, Study Coordinator, at [sdsu.healthresearch@sdstate.edu](mailto:sdsu.healthresearch@sdstate.edu), or by phone at (605) 688-6064.

## **Section 1. Practice Site Characteristics**

1. Are any of the following colorectal cancer (CRC) screenings performed at this practice site?  
(Please check all that apply.)

- ☐ Guaiac of digital rectal exam (DRE) specimen
- ☐ Guaiac-based 3-card Fecal Occult Blood Test (gFOBT)
- ☐ Fecal Immunochemical Test (FIT or iFOBT)
- ☐ Flexible Sigmoidoscopy
- ☐ Colonoscopies
- ☐ NONE

***\*If answered none, please STOP and return survey now. Thank you!***

2. Does this facility participate in the GetScreenedSD program?

- ☐ Yes
- ☐ No

3. In a typical week, how many hours is this clinic open for patient appointments?

\_\_\_\_\_ hours per week

4. Approximately how many weeks per year does this practice site have normal operations?  
(i.e., if the practice site is closed for ten holidays per year, then the answer would be 50 weeks.)

\_\_\_\_\_ weeks per year

5. Which of the following categories best describes your practice site?

- ☐ Family Practice Clinic
- ☐ Federally Qualified Health Center
- ☐ Outpatient Surgical Center
- ☐ Specialty Clinic
- ☐ Hospital
- ☐ VA Facility
- ☐ Other: \_\_\_\_\_

6. During a typical week, approximately how many outpatients are seen at this practice site?

- ☐ 100 or fewer
- ☐ 100-500
- ☐ 501-1000
- ☐ 1001-1500
- ☐ 1500+

7. Staffing information:

Provider Type	Number Full-Time	Number Part-Time (20 hours or less per week)
a. Family/General Practitioner		
b. Gastroenterologist		
c. General Surgeon		
d. Other Specialty Physician		
e. Nurse Practitioner		
f. Physician Assistant		
g. Residents supervised by attending physicians		
h. Other – specify: _____		

8. Approximately what percent of all patients at this practice site are female?

\_\_\_\_\_ % female

9. Approximately what percent of all patients at this practice site are:

Less than 18 years	%
18 – 44 years	%
45 – 50 years	%
51 – 64 years	%
65 -- 80 years	%
Over 80 years	%
	<b>100%</b>

White (Non-Hispanic)	%
American Indian or Alaska Native	%
Hispanic or Latino	%
Black or African-American	%
Asian	%
Native Hawaiian or Other Pacific Islander	%
Other	%
	<b>100%</b>

10. Approximately what percent of all patients at this practice site are insured by:

Medicaid	%
Medicare	%
Private Insurance	%
IHS or Tribal Contract Health	%
Veteran's Administration	%
Uninsured	%
Other – specify: _____	%
	<b>100%</b>

11. What type of medical record system does your practice site use?

- ☐ Paper charts
- ☐ Partial electronic health records (e.g. lab results available electronically, but patient history on paper)
- ☐ In transition from paper to full electronic medical records
- ☐ Full electronic medical records

12. Does this facility have its own written protocol/practice standard for colorectal cancer screening?

- ☐ Yes - **Please include a copy, if available.**
- ☐ No

13. How many colorectal **screening** procedures were performed at this practice site in **2011**?

Type of Screening	Number
Guaiaic of digital rectal exam (DRE) specimen	
Take home guaiaic-based Fecal Occult Blood Test (gFOBT)	
Fecal Immunochemical Test (FIT or iFOBT)	
Flexible Sigmoidoscopy	
Colonoscopy	

14. Does this facility remind your providers when their patients are due for any of the following?

- |   |   |
|---|---|
| <input type="checkbox"/> Colorectal Screening | <input type="checkbox"/> Assess smoking status  |
| <input type="checkbox"/> Mammography          | <input type="checkbox"/> Diabetes               |
| <input type="checkbox"/> Clinical Breast Exam | <input type="checkbox"/> Immunizations          |
| <input type="checkbox"/> Pap Smear            | <input type="checkbox"/> Depression             |
| <input type="checkbox"/> HPV test/Vaccine     | <input type="checkbox"/> Other (specify): _____ |
| <input type="checkbox"/> PSA                  |   |

15. How are providers reminded that a patient is due for colorectal cancer screening?

- ☐ Special notation or flag in patient's chart  
☐ Computer prompt or computer-generated flow sheet  
☐ Automatic prompt within the electronic health record  
☐ Other mechanism – specify: \_\_\_\_\_  
☐ No reminder

16. Does this facility track and notify patients when the following are due?

- |   |   |
|---|---|
| <input type="checkbox"/> Colorectal Screening | <input type="checkbox"/> Asthma                     |
| <input type="checkbox"/> Mammography          | <input type="checkbox"/> Annual Physical            |
| <input type="checkbox"/> Pap Smear            | <input type="checkbox"/> Cholesterol/Blood Pressure |
| <input type="checkbox"/> HPV test/Vaccine     | <input type="checkbox"/> Child/teen well check-ups  |
| <input type="checkbox"/> PSA                  | <input type="checkbox"/> Other (specify): _____     |
| <input type="checkbox"/> Diabetes             |   |
| <input type="checkbox"/> Immunizations        |   |

17. How does your practice site remind patients that they are due for colorectal cancer screening?

- ☐ Verbal prompt from providers during an office visit  
☐ Reminder by US mail  
☐ Reminder telephone call  
☐ Reminder by e-mail  
☐ Personalized web page  
☐ Patient-accessible electronic health record  
☐ Other mechanism – specify: \_\_\_\_\_  
☐ No patient reminder for CRC screening

18. Does this facility have a system to distribute provider feedback on their rates of CRC screening achievement?

- ☐ Yes  
☐ No

## Section 2. Colonoscopy

Please complete this section only if colonoscopies are performed on site. **Do not include referrals to outside facilities.** If you are unable to provide exact responses, please provide your best estimate for procedures performed by this entire practice site.

19. Do any healthcare providers perform colonoscopies at this practice site?

- ☐ Yes  
☐ No

*\* If no, SKIP to question 35.*

20. During a typical week, how many colonoscopies are performed at this practice site? (Please provide your best estimate, including screening, surveillance and diagnostic procedures.)

\_\_\_\_\_ Total number per week [OR \_\_\_\_\_ per month (if less than 1 per week)]

21. Of the total number of colonoscopies performed during a typical week, what percent are performed by the following types of practitioners? (Please provide your best estimate.)

a. Family/General Practitioner	%
b. Gastroenterologist	%
c. General Surgeon	%
d. Other Specialty Physician	%
e. Nurse Practitioner	%
f. Physician Assistant	%
g. Residents supervised by attending physicians	%
h. Other – specify: _____	%
100%	

22. Approximately what percent of all colonoscopies performed at this site are performed for: (Please provide your best estimate.)

Primary colorectal cancer screening	%
Diagnostic procedures (including follow-up of a positive screening test)	%
Follow-up after diagnosis and treatment	%
100%	

23. Could more colonoscopies be performed at this practice site **with no other investment of resources**?

- ☐ Yes  
☐ No

*\*If no, SKIP to question 25.*

24. If the demand for colorectal cancer screening and follow-up were to increase substantially, how many additional colonoscopies could be performed each week **with no other investment of resources**? (Please provide your best estimate.)

\_\_\_\_\_ additional colonoscopies per week

25. What are the limiting factors to performing more colonoscopies at this practice site?  
(Please circle. 1=YES, 2=NO)

	YES	NO
Insufficient time – Few appointments available for colonoscopies	1	2
Insufficient utilization due to cancellations or “no shows”	1	2
Insufficient number of providers available to perform procedures	1	2
Insufficient nursing staff to assist with procedures	1	2
Insufficient ancillary staff to assist with room turnover	1	2
Insufficient staff or physicians to monitor the sedation or anesthesia	1	2
Insufficient procedure rooms	1	2
Insufficient prep and/or recovery areas	1	2
Insufficient endoscopes or monitors	1	2
Insufficient reimbursement	1	2
Other: (Specify) _____	1	2

26. If the demand for colonoscopies were to exceed this practice site’s current capacity to perform colonoscopies, what steps would this practice site take to meet that increased demand? (Please circle. 1=YES, 2=NO)

	YES	NO
Not applicable – not planning to perform more colonoscopies	1	2
Increase hours or proportion of the work day allocated to procedures	1	2
Modify block scheduling	1	2
Use patient navigators or reminder calls to decrease cancellations and “no-shows”	1	2
Increase physician staff	1	2
Increase/hire non-physician endoscopists to perform procedures	1	2
Increase nursing staff to assist with procedures	1	2
Increase ancillary staff to help with room turnover	1	2
Increase staff or physicians to monitor sedation or anesthesia	1	2
Establish a larger screening unit/more procedure rooms	1	2
Establish additional prep and/or recovery areas	1	2
Purchase or lease more equipment	1	2
Other: (Specify) _____	1	2

27. What is the average room-time scheduled for a colonoscopy? \_\_\_\_\_ minutes

28. What is the typical waiting time for a **SCREENING** colonoscopy appointment at this practice site?

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> 1-2 weeks  | <input type="checkbox"/> 3-4 months |
| <input type="checkbox"/> 3-4 weeks  | <input type="checkbox"/> 5-6 months |
| <input type="checkbox"/> 1-2 months | <input type="checkbox"/> 6 + months |



29. What is the typical waiting time for a **DIAGNOSTIC** colonoscopy appointment at this practice site?

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| <input type="checkbox"/> 1-2 weeks  | <input type="checkbox"/> 3-4 months |
| <input type="checkbox"/> 3-4 weeks  | <input type="checkbox"/> 5-6 months |
| <input type="checkbox"/> 1-2 months | <input type="checkbox"/> 6 + months |

30. In this practice site, approximately what percent of all colonoscopies are incomplete (i.e., the cecum cannot be reached)?

\_\_\_\_\_ %

31. In this facility, is the adenoma detection rate (ADR) calculated for :

	YES	NO
a. the facility overall?	1	2
b. each provider?	1	2
c. the facility by gender?	1	2
d. the provider by gender?	1	2

32. In this facility, are quality measures (e.g., cecal intubation rate or adenoma detection rate) reported to a centralized quality registry?

- ☐ No
- ☐ Yes, Clinical Outcomes Research Initiative (CORI)
- ☐ Yes, AGA Digestive Health Outcomes Registry
- ☐ Yes, GI Quality Improvement Consortium (GIQuIC)
- ☐ Yes, Other: \_\_\_\_\_

33. What is the **MOST COMMON** reason at this practice site for an incomplete colonoscopy? (Please check only one.)

- ☐ Poor bowel preparation
- ☐ Patient discomfort or pain
- ☐ Technical difficulties (e.g., spasms, adhesions, tortuosity)
- ☐ Other - specify: \_\_\_\_\_

34. If a colonoscopy is incomplete because of poor bowel preparation or patient discomfort/pain, what would be the next step? (Please check all that apply.)

- ☐ Repeat the colonoscopy at a later date
- ☐ Order a double contrast barium enema
- ☐ Not applicable
- ☐ Other - specify: \_\_\_\_\_

### **Section 3. Flexible Sigmoidoscopy**

Please complete this section only if flexible sigmoidoscopies are performed on site. **Do not include referrals to outside facilities.** If you are unable to provide exact responses, please provide your best estimate for procedures performed by this entire practice site.

35. Do any healthcare providers perform flexible sigmoidoscopies at this practice site?

- ☐ Yes  
☐ No

***\* If no, SKIP to question 39.***

36. During a typical week, how many flexible sigmoidoscopies are performed at this practice site? (Please provide your best estimate.)

\_\_\_\_\_ Total number per week [OR \_\_\_\_\_ per month (if less than 1 per week)]

37. Of the total number of flexible sigmoidoscopies performed during a typical week, what percent are performed by the following types of practitioners? (Please provide your best estimate.)

a. Family/General Practitioner	%
b. Gastroenterologist	%
c. General Surgeon	%
d. Other Specialty Physician	%
e. Nurse Practitioner	%
f. Physician Assistant	%
g. Residents supervised by attending physicians	%
h. Registered Nurse (RN)	%
i. Other – specify: _____	%
<b>100%</b>	

38. Approximately what percent of all flexible sigmoidoscopies performed at this site are for colorectal cancer **SCREENING**? (Please provide your best estimate. If NONE, please record "0".)

\_\_\_\_\_ %

#### **Section 4. Guaiac-Based Fecal Occult Blood Testing (gFOBT)**

39. Do any healthcare providers at this practice site perform guaiac of digital rectal exam (DRE) specimens or order take home guaiac fecal occult blood tests (gFOBT)?

- ☐ Yes  
☐ No

***\* If no, SKIP to question 46.***

40. During a typical week, how many guaiac of DRE specimen or home gFOBT tests are ordered for colorectal cancer screening at this practice site? (Please provide your best estimate.)

\_\_\_\_\_ total guaiac of DRE specimen tests per week

\_\_\_\_\_ total home gFOBT tests per week

41. Of the total DRE specimen guaiac tests or home gFOBT tests ordered for CRC screening during a typical week, what percent are ordered by the following practitioners? (Please provide your best estimate.)

a. Family/General Practitioner	%
b. Gastroenterologist	%
c. General Surgeon	%
d. Other Specialty Physician	%
e. Nurse Practitioner	%
f. Physician Assistant	%
g. Residents supervised by attending physicians	%
h. RN/LPN	%
i. Other – specify: _____	%
<b>100%</b>	

42. What are the limiting factors to performing more DRE specimen guaiac tests or ordering more home gFOBT at this practice site? (Please circle. 1=YES, 2=NO)

	YES	NO
Insufficient nursing staff to provide instruction	1	2
Insufficient reimbursement	1	2
No lab to process specimen	1	2
Other – specify: _____	1	2

43. How are the gFOBT or DRE specimen guaiac tests processed?

- ☐ On site  
☐ Mailed to lab  
☐ Other – Specify: \_\_\_\_\_

44. What percentage of home gFOBT testing is incomplete/never returned by the patient? \_\_\_\_\_%

45. How does your site improve return rate? (Check all that apply.)

- ☐ Phone calls  
☐ Re-order test  
☐ Ask patient to complete test on site  
☐ Refer for other CRC screening  
☐ Other – specify: \_\_\_\_\_

## Section 5. Fecal Immunochemical Test (FIT or iFOBT)

46. Do any healthcare providers at this practice site order iFOBT or FIT?

- ☐ Yes  
☐ No

**\* If no, SKIP to question 53.**

47. During a typical week, how many FIT or iFOBT tests are ordered for colorectal cancer screening at this practice site? (Please provide your best estimate.)

\_\_\_\_\_ total number per week

48. Of the total FIT or iFOBT tests ordered for CRC screening during a typical week, what percentage is ordered by the following practitioners? (Please provide your best estimate.)

a. Family/General Practitioner	%
b. Gastroenterologist	%
c. General Surgeon	%
d. Other Specialty Physician	%
e. Nurse Practitioner	%
f. Physician Assistant	%
g. Residents supervised by attending physicians	%
h. RN/LPN	%
i. Other – specify: _____	%
<b>100%</b>	

49. What are the limiting factors to ordering more FIT or iFOBT at this practice site? (Please circle 1=YES; 2=NO.)

	YES	NO
Insufficient utilization due to cancellations or “no shows”	1	2
Insufficient reimbursement	1	2
No lab to process specimen	1	2
Other – specify: _____	1	2

50. How are the FIT or iFOBT tests processed?

- ☐ On site  
☐ Mailed to lab  
☐ Other – specify: \_\_\_\_\_

51. What percentage of iFOBT or FIT testing is incomplete/never returned by the patient? \_\_\_\_\_%

52. How does your site improve return rate? (Check all that apply.)

- ☐ Phone calls  
☐ Re-order test  
☐ Ask patient to complete test on site  
☐ Refer for other CRC screening  
☐ Other – specify: \_\_\_\_\_

Facility Code: \_\_\_\_\_

Zip Code: \_\_\_\_\_

(For data entry purposes only)

53. Please provide any additional information or comments regarding colorectal cancer screening at this practice site:

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Thank you for taking time to complete this survey! Please mail the completed survey in the addressed and postage paid envelope.

Return address:

Amanda Mitchell  
SDSU College of Nursing  
Box 2275  
Brookings, SD 57007