Feasibility Of Sigmoidoscopic Screening For Bowel Cancer In A Primary Care Setting

David L. Hahn, M.D.

Abstract: Sigmoidoscopic screening for bowel cancer is controversial because of its debatable efficacy, lack of patient and physician acceptance of the procedure, and uncertainty about its practicality with the large numbers of patients in primary care settings. This study addressed patient acceptance and practicality. During an 18-month period, 75 percent of all patients aged 50 years and greater who were seen for health maintenance accepted sigmoidoscopy. The procedure was integrated into office routines without disrupting other patient care. While compliance with fecal occult blood testing was high (88 percent), sensitivity of this test for neoplastic polyps within reach of the proctosigmoidoscope was low (11 percent). These results suggest that acceptance of sigmoidoscopy by patients seen in family physicians' offices could be greater than has been anticipated. (J Am Bd Fam Pract 1989; 2:25-9.)

Experts' recommendations for health screening activities are often (but not always) based on clinical studies that show benefit to patients, but in the "real world" of the primary physician's office, other factors play a role in determining whether recommended activities are carried out. Other factors include: (1) the physician's interest in the recommended procedures, (2) the patient's acceptance of them, and (3) the ease with which they can be integrated into a busy practice setting. The net effect of these factors constitutes "feasibility" for the purpose of this report.

Sigmoidoscopic screening for bowel cancer is a controversial procedure, and its feasibility has never been determined. Most physicians do not do it.[1] One authority claims that most patients will not accept it.[2] Another believes it is not practical in the primary care setting.[3] Although sigmoidoscopic screening is recommended by the American Cancer Society,[4] it is not recommended by other authorities who prefer screening for bowel cancer by means of fecal occult blood testing only.[5-7]

If the fecal occult blood test were a perfect test, there would be no need to consider the merits of sigmoidoscopic screening because of the relative simplicity of the former. However, the fecal occult blood test is not a perfect test for cancer. There is a high false-positive rate: only 1 in 10 average-risk patients with a positive screening test will have cancer.[8-10] There is a moderately high estimated false-negative rate, although final conclusions will have to await the results of ongoing prospective trials.[11,12] Preliminary results suggest that the overall false-negative rate is about 30 percent.[8] Moreover, the false-negative rate for cancer in the distal colon (the area within reach of the sigmoidoscope) is higher. One review stated that the overall false-negative rate of the Hemoccult™ test for known cancer was between 33 to 50 percent and that results were more likely to be negative in left-sided lesions.[10] Another study found a false-negative rate of 45 percent for known rectal cancer.[13]

In addition to the high false-positive and relative high false-negative rate of the fecal occult blood test for cancer, its sensitivity for the detection of neoplastic polyps is extremely low. All authorities have agreed that the test will miss at least 75 percent of these polyps.[8,10,14,15] Detection of neoplastic polyps is important in light of a report that detecting polyps and removing them (the study involved more than 85,000 patient/years experience) reduced the expected frequency of cancer in the "proctosigmoidoscopic area" by 85 percent.[16]

The medical literature summarized here suggests that fecal occult blood screening and sigmoidoscopic screening are complementary procedures that ought to be performed together to

From Arcand Park Clinic, Madison, WI. Address reprint requests to David L. Hahn, M.D., Dean Medical Center, Arcand Park Clinic, 3434 East Washington Avenue, Madison, WI 53704.

Supported in part by the Wisconsin Institute of Family Medicine, Milwaukee, WI.

increase the likelihood of detecting early, asymptomatic bowel cancer and to prevent some of it by the removal of polyps. Therefore, it is worthwhile to reconsider the feasibility of sigmoidoscopic screening.

Materials and Methods

This report describes the first 18 months' experience after sigmoidoscopic screening was added to fecal occult blood testing in a patient population aged 50 years and greater.*

Practice Demographics

The practice was composed of 3 family physicians who were affiliated with a large multispecialty, multisite group in Madison, Wisconsin (population 176,000). The patient population was predominately white, and the majority were lower level state and university employees, blue-collar and service industry employees, and retirees.

Within the setting, each physician/nurse team maintained its own practice. Most patients could identify their own physician. New patients were encouraged to choose one practitioner for continuity of care. My practice included the usual range of problems encountered in family medicine, including surgical assisting but excluding obstetrics. I saw approximately 25 patients per day in the office and hospitalized and cared for 80 to 100 inpatients per year. During the 18-month period reported here (12/1/84 to 6/1/86), I had more than 6500 patient encounters with 3370 patients; 556 (16.5 percent) were aged 50 years and greater.

Patient Selection

All patients aged 50 years and greater who requested a general medical examination (including a visit for Papanicolaou smear only) were eligible for consideration and were included as the denominator for calculating rates. This group was termed the Health Maintenance (HM) group. Patients who were seen for acute care visits were not offered sigmoidoscopy (unless they returned for a general medical examination). This group was termed the non-Health Maintenance (non-HM) group. Sigmoidoscopies done because of signs or symptoms suggesting bowel neoplasia were not considered for screening (Table 1).

Table 1. *Patient Selection.*

Patients in practice =	3370
Patients ≥ 50 years =	556
Patients ≥ 50 years HM group =	185
Patients ≥ 50 years non-HM group =	371

Statistical Analysis

Chi-square analysis was done to compare differences in acceptance rates for patients with dichotomous characteristics (frequent versus infrequent visits; hospitalized versus nonhospitalized). *P* values less than 0.05 (two-tailed) were considered significant.

Results

Fecal Occult Blood Screening

The HM group consisted of 185 patients aged ≥50 years (33.3 percent of the total number of patients aged ≥50 years seen during the study period). Of the HM group, 164 (88.6 percent) returned fecal occult blood samples (6-slide Hemoccult II™), 3 of whom had positive tests. On thorough examination (including colonoscopy) 1 of the 3 had a cecal villous adenoma without malignancy.

Sigmoidoscopic Screening

There were 134 asymptomatic patients in the HM group who underwent rigid sigmoidoscopic examination (Table 2). Excluding the 3 patients in this group with positive fecal occult blood tests (who had further studies for diagnosis, not screening), 131 asymptomatic patients underwent sigmoidoscopy for screening purposes (60 men, 71 women). Average age of these 131 patients was 61. None was known to be a member of a "cancer family" pedigree (a family with an extremely high rate of colon, breast, and female genital cancer),[17] although 7 of 131 (5.3 percent) reported a positive family history of at least one case of colon cancer (not further defined). All 131 patients had negative 6-slide Hemoccult II™ tests.

*It is important to note that at the time of this study, I had no experience with the flexible sigmoidoscope, and all the sigmoidoscopies reported here were performed with the 25-cm rigid sigmoidoscope.

Table 2. *Findings on Screening.*

HM group	
Fecal occult blood tests	164
Positive tests	3
Villous adenoma	1
Sigmoidoscopy	134
Exclude positive blood	3
Polyps found	8
Cancer found	0
Total polyps found	9

During sigmoidoscopic screening, neoplastic polyps (including 3 villous adenomas) were found in 8 of 131 patients (6.1 percent). Taking into account the one villous adenoma discovered by the 6-slide Hemoccult II™ test, the false-negative rate for the 6-slide Hemoccult II™ test for polyps in this small series was 8/9 (88 percent).

A total of 196 rigid sigmoidoscopic examinations were performed in both symptomatic and asymptomatic patients aged ≥50 years. Average depth of insertion was 20.5 cm (range 15 to 25 cm). There were no complications.

Patient Acceptance

Of the 185 patients in the HM group, 166 (89.7 percent) were offered sigmoidoscopic screening, and 134 of 166 (80.7 percent) accepted and underwent the procedure. Therefore, 72.4 percent of the entire HM group underwent sigmoidoscopic screening.

Thirty-two of 166 who were offered sigmoidoscopic screening refused it. Refusals were classified as follows: (1) an outright statement of refusal in 10 of 32 (31.3 percent), (2) a "passive" refusal in 17 of 32 (53.1 percent) manifested either by failure to schedule or to show up for the scheduled procedure, and (3) a request in 5 of 32 (15.6 percent) to defer sigmoidoscopic screening until flexible sigmoidoscopy became available.

When the performance of sigmoidoscopy was related to frequency of patient visits during the study period (Figure 1), it became apparent that there was a relation between performance and degree of patient contact. For HM group patients seen one or two times (n = 59), the performance rate was 55.9 percent. For HM group patients seen three or more times (n = 126), the rate was 80.2 percent ($P<0.001$, $\chi^2 = 11.8$).

Figure 1 also shows that the majority of non-HM group patients were seen infrequently: 282 of 334 (84.4 percent) were seen one or two times.

The non-HM group patients seen more than three times (n = 33) were unique. Each of these patients was well known to me, and I considered 31 of 33 (94 percent) to be regular patients and therefore candidates for health screening. For the most part, however, this group had been followed for significant medical illnesses, and health screening had not been a priority. For example, 10 of the 33 (30.3 percent) non-HM group patients were hospitalized during the study period, whereas only 5 of 67 (7.5 percent) HM group patients with similar visit frequency who had sigmoidoscopic screening were hospitalized ($P<0.01$, $\chi^2 = 9.49$). Sigmoidoscopic screening was offered to 16 of the 33 (48.5 percent) chronically ill patients, and 9 (56.3 percent) accepted and 7 (43.7 percent) refused.

Similarly, the HM group patients who were seen more than three times but did not receive sigmoidoscopy (n = 19) were a sicker group of patients than their counterparts who had sigmoidoscopy: 6 of 19 (31.6 percent) were hospitalized ($P<0.01$, $\chi^2 = 7.7$). Furthermore, 11 of 19 (58 percent) were not offered sigmoidoscopic screening because their conditions did not warrant it.

Failure to Offer Sigmoidoscopy

Reasons for not offering sigmoidoscopic screening to certain HM group patients included advanced age, chronic psychosis, and other chronic disease. The largest group not to be offered sigmoidoscopic screening was the non-HM group by virtue of the study design. Reasons included: (1) patient refusal of health screening when offered by the physician, (2) failure of the physician to offer health screening to patients who

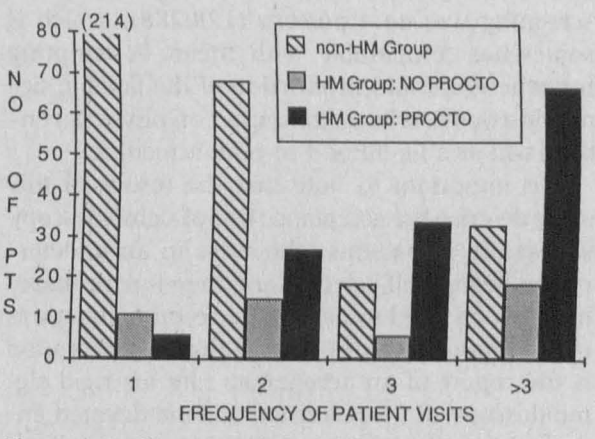

Figure 1. Performance of sigmoidoscopy and frequency of patient visits.

might otherwise have accepted it, and (3) inclusion of other physicians' patients seen during cross-coverage.

Discussion

Physician and Patient Acceptance

The potential benefits of adding sigmoidoscopic screening to my practice were convincing, and 80.7 percent of patients who were offered sigmoidoscopic screening accepted it despite the fact that the screening instrument was the rigid rather than the flexible sigmoidoscope. It is unclear why there was such a high patient acceptance rate in the face of published reports that sigmoidoscopic screening has been a failure.[8] Perhaps patient acceptance in this study was related to greater publicity about and changing public attitudes towards bowel cancer. There is no evidence, however, to confirm or reject this possibility.

Sometimes it is difficult in practice to separate physician-acceptance issues from patient-acceptance issues. For example, a study of the impact of flexible sigmoidoscopy for cancer screening in a family practice residency program showed that the frequency of sigmoidoscopic screening rose to 54 percent 3 years after the introduction of it.[18] Although the authors attributed this increased screening activity to the flexible sigmoidoscope, they did not report whether increased performance was related to greater patient acceptance of flexible sigmoidoscopy over rigid sigmoidoscopy or to a greater tendency for physicians to offer flexible sigmoidoscopy. Their study included all patients seen more than once each year. For patients seen more than once in the study reported here (both HM group and non-HM group patients), the performance rate for sigmoidoscopic screening was 44.4 percent (128/288), which is somewhat comparable with theirs. A tempting hypothesis is that introduction of the flexible sigmoidoscope had its major impact on physician enthusiasm and likelihood to offer screening.

It is important to note that the results of this study describe the acceptance rate of sigmoidoscopy in a group of patients who were to an undetermined degree self-selected and therefore probably highly motivated to accept the recommendations of the physician. Consistent with this observation is the report of an acceptance rate for rigid sigmoidoscopy of 95 percent at a clinic devoted entirely to health screening.[12] It will be important to determine whether an unselected primary care patient population will accept sigmoidoscopic screening, and such a study is being planned. It will be of interest also to determine what proportion of the HM group who accepted sigmoidoscopic screening will continue to accept it at periodic intervals. Although it will be several years before these data become available, the primary care office is the ideal laboratory in which to conduct such a study.

Incorporating Sigmoidoscopic Screening into the Practice Setting

The experience reported here confirms a published report that sigmoidoscopic screening can be successfully incorporated into the office setting.[19] The performance of one screening examination at the beginning of office hours has not disrupted patient care in my opinion and in my nurse's opinion. Screening is now being done with the 65-cm flexible sigmoidoscope, and it is rare for an examination to exceed 15 minutes. Published reports of time required to complete flexible sigmoidoscopic examinations range from 5 to 12 minutes.[20]

If one accepts a screening interval of 5 years,[4] a population of 1000 patients aged ≥50 years, a physician who practices 40 weeks per year (200 days), and a patient acceptance rate of 80 percent, then it would be necessary to do one sigmoidoscopic screening examination four times weekly. This is an achievable goal for a motivated physician.

The Non-Health Maintenance Group

Numerically, this group was twice as large as the HM group. It is obvious that a large population of unscreened patients is a major obstacle to cancer prevention, and published data exist to support this point.[21] The non-HM group was heterogeneous and represented patients who refused screening when it was offered as well as patients who were not offered screening and did not ask for it. It is unclear what proportion of this group can be convinced to participate in health screening activities in the future. It is now a priority in my practice to provide health screening services that include: (1) incorporating a "Health Maintenance Data Base"[22] into charts for all patients in the practice, (2) discussing health maintenance with all patients (not just those who request screening examinations),

and (3) introducing these techniques to fellow practitioners. My initial experience has been that the majority of patients are pleased to have health screening offered.

The author acknowledges the assistance of Ellen Comiskey for data analysis; Gene Bettinger and Sydney Lane for computerized data; and Drs. John Beasley, Jim Davis, Mike Fleming, Dan Meyer, and William Scheckler for reviewing drafts of this manuscript.

References

1. Survey of physicians' attitudes and practices in early cancer detection. CA 1985; 35:197-213.
2. Winawer SJ, Leidner SD, Boyle C, Kurtz RC. Comparison of flexible sigmoidoscopy with other diagnostic techniques in the diagnosis of rectocolon neoplasia. Dig Dis Sci 1979; 24:277-81.
3. Frame PS. Screening flexible sigmoidoscopy: is it worthwhile? An opposing view. J Fam Pract 1987; 25:604-7.
4. Eddy D. ACS report on the cancer-related health checkup. CA 1980; 30:193-240.
5. Frame PS. A critical reivew of adult health maintenance. Part 3: prevention of cancer. J Fam Pract 1986; 22:511-20.
6. The periodic health examination: 2. Update (1984). From the Canadian Task Force on the Periodic Health Examination (1982-84). Union Med Can 1984; 113:796-803.
7. Breslow L, Somers AR. The lifetime health-monitoring program. A practical approach to preventive medicine. N Engl J Med 1977; 296:601-8.
8. Winawer SJ, Sherlock P. Surveillance for colorectal cancer in average-risk patients, familial high-risk groups, and patients with adenomas. Cancer 1982; 50:2609-14.
9. Bader JP. Screening of colorectal cancer. Dig Dis Sci 1986; 31:43S-56S.
10. Simon JB. Occult blood screening for colorectal carcinoma: a critical review. Gastroenterology 1985; 88:820-37.
11. Gilbertson VA, Church TR, Grewe FJ. The design of a study to assess occult-blood screening for colon cancer. J Chronic Dis 1980; 33:107-14.
12. Winawer SJ, Andrews M, Flehinger B, Sherlock P, Schottenfeld D, Miller DG. Progress report on controlled trial of fecal occult blood testing for the detection of colorectal neoplasia. Cancer 1980; 45:2959-64.
13. Leicester RJ, Lightfoot A, Millar J, Colin-Jones DG, Hunt RH. Accuracy and value of the Hemoccult test in symptomatic patients. Br Med J 1983; 286:673-4.
14. Kolata G. Debate over colon cancer screening. Science 1985; 229:636-7.
15. Lipshutz GR, Katon RM, McCool MF. Flexible sigmoidoscopy as a screening procedure for neoplasia of the colon. Surg Gynecol Obstet 1979; 148:19-22.
16. Gilbertsen VA. Proctosigmoidoscopy and polypectomy in reducing the incidence of rectal cancer. Cancer 1974; 34:936-9.
17. Love RR, Morrissey JF. Colonoscopy in asymptomatic individuals with a family history of colorectal cancer. Arch Intern Med 1984; 144:2209-11.
18. Rodney WM, Beaber RJ, Johnson R, Quan M. Physician compliance with colorectal cancer screening (1979-1983): the impact of flexible sigmoidoscopy. J Fam Pract 1985; 20(3):265-9.
19. Varma JR. Felxible fiberoptic sigmoidoscopy, logistics and economics of office use. Consultant 1987; 27(8):96-9.
20. Johnson RA, Quan M, Rodney WM. Flexible sigmoidoscopy. J Fam Pract 1982; 14:757-70.
21. Berner JS, Frame PS, Dickinson JC. Ten years of screening for cancer in a family practice. J Fam Pract 1987; 24:249-52.
22. Frame PS. A critical review of adult health maintenance. Part 4. Prevention of metabolic, behavioral, and miscellaneous conditions. J Fam Pract 1986; 23:29-39.