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# Procedures in Family Practice

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## Flexible Sigmoidoscopy

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Flexible sigmoidoscopy became available in 1976. To date, studies comparing it with rigid sigmoidoscopy support an increase of 2.5 to six times in the flexible sigmoidoscope's ability to detect polyps, and a two- to threefold increase in detection of colonic neoplasms in the same patients. This paper summarizes the current reported results of flexible sigmoidoscopy to date and describes the instrument and procedure as done at the UCLA Family Practice Residency Program. The flexible sigmoidoscope deserves evaluation for widespread primary care application.

The incidence of colorectal cancer is approximately 45 per 100,000 people; 114,000 new cases are discovered each year. Because of the increased five-year survival in Duke's A (90 percent) vs Duke's C (35 percent) lesions and the increased proportion of Duke's A lesions found in screened (63 percent) vs nonscreened (15 percent) populations,<sup>1</sup> multiple strategies for screening symptomatic and asymptomatic individuals have emerged and continue to be evaluated.

The American Cancer Society has recommended a fairly aggressive approach to colorectal cancer screening in asymptomatic individuals. They currently advocate (1) digital rectal examinations annually in all persons over age 40 years, (2) annual stool guaiac testing after age 50 years, (3) sigmoidoscopy every three to five years after two initial negative sigmoidoscopies one year apart in all persons over age 50 years, and (4) more frequent and intensive examinations beginning at an earlier age in patients with a personal or family history of colonic neoplastic lesions.<sup>2</sup>

A recent review of proctosigmoidoscopy has been published by Dutton.<sup>3</sup> He concluded that the data supported the usage of sigmoidoscopy as a

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Table 1. Comparative Studies

Author	Number of Parts Examined	Number of Asymptomatic Parts	Number of Polyps Found		Number of Cancers Found		Average Distance (cm)		Average Time (min) per Examination	
			RS	FS	RS	FS	RS	FS	RS	FS
Bohlman et al <sup>9</sup>	120	37	6	30	2	6	20	55	5.9	9.4
McCallum et al <sup>11</sup>	342	NR	6*	37	2	4	20	48	6	12
Marks et al <sup>16</sup>	1,012	203	106	253	11	26	20	50	5	6
Winnan et al <sup>18</sup>	342	127	6*	36	1	3	20	50	6	12
<b>Reports of Flexible Sigmoidoscopy</b>										
Goldsmith et al <sup>12</sup>	1,000	1,000	56	NR	0	NR	NR	NR	NR	NR
Talbot et al <sup>13</sup>	100	NR	NR	NR	NR	NR	18	39	NR	NR
Marino et al <sup>14</sup>	140	NR	NR	NR	NR	NR	45	NR	10	NR
Manier et al <sup>15</sup>	140	41	NRA	NR	NRA	NR	NRA	NR	5	NR
Meyer et al <sup>17</sup>	412	122	64	NR	7	NR	46	NR	9	NR
NR, not reported; NRA, not reported accurately; RS, rigid sigmoidoscopy; FS, flexible sigmoidoscopy; * reported only adenomatous polyps										

periodic screening test for colorectal cancer and that, combined with annual stool guaiac testing, it could significantly reduce both mortality and morbidity rates. Part of the support for his conclusions came from published proctosigmoidoscopy detection rates for neoplastic colonic lesions.<sup>4</sup> Portes and Majarakis had a detection rate of 0.69 percent for malignant lesions and 7.3 percent for polyps in their study of 50,000 asymptomatic patients.<sup>5</sup> Bolt concluded that studies support a detection rate of 1.5 to 3 per 1,000 examinations with proctosigmoidoscopy in asymptomatic patients.<sup>6</sup>

Recent studies seem to indicate that the spatial distribution of colonic polyps and cancer is changing

and that the lesions are moving more proximally out of the reach of the rigid sigmoidoscope.<sup>7-9</sup> Tedesco et al found a total of 39 cancers and 199 polyps in 642 selected patients. Of these cancers and polyps, 11 (28 percent) and 10 (5 percent), respectively, were less than 25 cm from the anus. Fourteen (36 percent) cancers and 121 (61 percent) polyps were between 25 and 60 cm from the anus. A total of 36 percent of all cancers and 34 percent of all polyps found were greater than 60 cm from the anus.<sup>8</sup>

This proximal movement in colon cancer, coupled with the approximate 20-cm limit of visualization with the rigid sigmoidoscope,<sup>10</sup> implies that the potential for finding colon cancer by rigid sig-

moidoscopy is diminishing and that an instrument allowing a greater depth of insertion would improve detection rates.

### Reported Experience with Flexible Fiberoptic Sigmoidoscopy

In 1976 the 60-cm flexible fiberoptic sigmoidoscope became available, allowing easy visualization of the sigmoid colon without the problems and liabilities of full-scale colonoscopy. These new instruments could be utilized without sedation, analgesia, or excessive preparation, and the procedure could be done easily in an office setting. Bohlman et al were the first to report a clinical trial comparing the conventional rigid sigmoidoscope and the new flexible fiberoptic sigmoidoscope.<sup>9</sup> Since that time, numerous other comparisons of flexible sigmoidoscopy with rigid sigmoidoscopy and reports of flexible sigmoidoscopy alone have appeared in the literature.<sup>11-18</sup>

A summary of their findings is shown in Table 1. This summary omits information for other types of lesions found (ie, inflammatory bowel disease, strictures, diverticulosis, and hemorrhoids). For most of these disease entities the flexible sigmoidoscope has proved clinically superior to the rigid sigmoidoscope. The summary of these studies in Table 1 does not distinguish size and histology of polyps (except as noted), but this information is mentioned in some of the individual references. Malignant polyps, when reported, are counted as cancer.

Results of these data support a two- to threefold increase in the ability of flexible sigmoidoscopy to detect malignant lesions, and an increase of 2.5 to 6 times in the ability of the flexible sigmoidoscopy to detect polyps compared to rigid sigmoidoscopy in these selected symptomatic and asymptomatic patients. It is of interest that Goldsmith's group, using the flexible sigmoidoscope, found only a 5.3 percent incidence of polyps and no malignant lesions in 1,000 asymptomatic individuals,<sup>12</sup> compared to an 11 to 12 percent incidence of polyps in Mark's and Meyer's subgroups of asymptomatic patients.<sup>16,17</sup> Meyer's group found one carcinoma in 122 asymptomatic individuals with a flexible sigmoidoscope. This difference may be a reflection of the relative preponderance of health and

youth in the Kaiser patient population requesting physical examinations.

By combining the data from Bohlman, McCallum, Marks, Winnan, Goldsmith, and Meyer, from Table 1, it is possible to evaluate flexible sigmoidoscopy in a large mixed patient population. A certain fraction are asymptomatic requesting a complete physical examination, and a larger fraction are symptomatic with a change in bowel habits, abdominal pain, occult blood in their stools, rectal bleeding, and related complaints. This mix is more typical of those found in the primary care office base practice. In this total group of 3,228 examinations, 46 (1.4 percent) malignancies and 476 (15 percent) polyps were detected.

### Use of the Flexible Fiberoptic Sigmoidoscope

Based upon the encouraging results of flexible sigmoidoscopy to date, the use of this procedure is being evaluated in the UCLA Family Health Center Residency Training Program. Training methods as well as outcome results are being investigated, using an ACMI T-91S Dual Channel flexible fiberoptic sigmoidoscope, coupled with an ACMI 910 Air and Light Source, for evaluation of symptomatic and asymptomatic patients. A standard Gomco suction machine is used. Tap water through a syringe is used for irrigation. Tissue biopsy is accomplished with endoscopic biopsy forceps.

### Selection of Patients for Flexible Sigmoidoscopy

Consenting patients are selected for routine screening purposes if they are over the age of 50 years (American Cancer Society recommendation), or because of symptoms (ie, guaiac positive stools, change in bowel habits, abdominal pain, or rectal bleeding).

### Contraindications

Relative contraindications for flexible sigmoidoscopy include inflammatory bowel diseases, imperforate anus, toxic megacolon, strictures, and

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the suspicion of an infectious bowel process (eg, salmonellosis, shigellosis, or amebiasis).

### Procedure

1. The resident is supervised at all times by a trained, full-time faculty member.
2. The bowel preparation consists of one or two Fleet's enemas thirty minutes prior to the examination.
3. The patient signs a consent form, being told of the complications, which include hemorrhage, breathing difficulties, abdominal discomfort, vasovagal reaction, and bowel perforation.
4. The patient is placed in the left lateral decubitus position.
5. Digital rectal examination is performed.
6. Anoscopy is performed using standard procedures.
7. The flexible sigmoidoscope is then passed, with the lumen always visualized, until the patient experiences any discomfort, the lumen can no longer be traversed, or the length of the scope has been reached.
8. As little air as possible is used in passing the flexible sigmoidoscope.
9. The scope is withdrawn, carefully visualizing the entirety of the sigmoid and rectal mucosa.
10. The length of time to complete the examination and the degree of patient comfort are recorded.
11. Biopsies of suspicious lesions are accomplished using biopsy forceps with the following precautions: A. Intramural lesions are biopsied only if within 10 cm from the anus. B. Intraluminal lesions are biopsied only if within 20 cm from the anus. C. No lesions are biopsied beyond 20 cm from the anus. D. Lesions beyond 20 cm are referred to the Division of Gastroenterology for further evaluation. These biopsy precautions are followed to help prevent the possibility of perforation and minimize the use of electrocautery in the partially prepped bowel. Bleeding biopsy lesions less than 20 cm from the anus can be managed with chemical cautery via the rigid sigmoidoscope. Electrocautery should not be performed in the partially prepped bowel.
12. Polypectomies are not being performed at the patient's initial flexible sigmoidoscopy. If one or more significant polyps are seen, the patient is

generally referred for colonoscopy, as these patients have higher incidence of colonic polyps beyond the reach of the flexible sigmoidoscope. Additionally, polypectomies should not be performed with only a minimal bowel prep.

13. After flexible sigmoidoscopy, the patient is observed for approximately five to ten minutes, at which time the results of the examination are explained.

### Discussion

#### *Who Should Perform Flexible Sigmoidoscopy?*

Initial experience with the flexible sigmoidoscope with the family practice residents and faculty has been very encouraging. The studies mentioned in Table 1 have involved colorectal surgeons experienced with endoscopy, gastrointestinal Fellows in conjunction with gastroenterologists, and solely gastroenterologists.<sup>9,11,12,16-18</sup> Mention is made of colleagues of less endoscopic experience and medical residents having little difficulty mastering the technique.<sup>15</sup> Marks et al cautioned the untrained individual using the flexible sigmoidoscope, and further stated that the commonly employed teaching method of trial and error used for rigid sigmoidoscopy is not applicable to the flexible sigmoidoscope. They felt that structured training programs, using simplified teaching methods, could increase the number of flexible sigmoidoscopists.<sup>16</sup> The American Cancer Society and the Ohio Academy of Family Physicians are sponsoring a resident training program in flexible sigmoidoscopy. To date, there are no published studies to evaluate the adequacy of teaching flexible sigmoidoscopy, nor are there studies to evaluate the application of flexible sigmoidoscopy to widespread primary care use.

#### *Complications*

Complications of flexible sigmoidoscopy have been reported,<sup>19</sup> but in these series the only mention of complication was Manier's where in his series of 140 patients he reported, "two complications encountered were minor and easily handled."<sup>15</sup>

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### Cost of Flexible Sigmoidoscopy

The cost of the flexible fiberoptic sigmoidoscope is approximately \$5,000 per unit. Many authors have concluded this initial cost as well as the maintenance cost to be too prohibitive for widespread use. Because of the frequency of its use few would argue that the time honored ECG machine at \$3,000 per unit is prohibitive for the primary care physician. If a primary care physician followed the recommendations of the American Cancer Society, he or she will be doing numerous sigmoidoscopies, thereby making the investment more cost effective.

In Dutton's review of rigid sigmoidoscopy as a screening tool, he concludes that the cost of detecting a curable malignant lesion would be \$7,000 per lesion, based upon a \$20 fee for sigmoidoscopy with an incidence rate of 2 per 1,000 (0.2 percent).<sup>2</sup> By using the aforementioned detection rate of 1.4 percent for neoplastic lesions (from the combined flexible sigmoidoscopic data of symptomatic and asymptomatic patients from Table 1), it would cost \$1,000 to detect a curable malignant lesion in this select group of patients. More important, many more lives could be saved. It is unlikely that physicians will be apt to charge \$20 for flexible sigmoidoscopy. An examination charge up to \$140 for flexible sigmoidoscopy in this group of symptomatic and asymptomatic representative patients would incur the same cost of \$7,000 per curable lesion. In evaluating cost-effectiveness studies, one must keep in mind the total expense of treating and caring for advanced malignant lesions. This can be considerably expensive, particularly if these individuals have care rendered in intensive care units.

### Summary

The flexible sigmoidoscope is diagnostically superior to the rigid sigmoidoscope for the detection of malignancy, polyps, and other colorectal pathological entities. The procedure can be taught and performed effectively and safely by the primary care physician. The flexible sigmoidoscope's diagnostic superiority clearly warrants further study of its applicability to primary care. The high initial

cost of the flexible sigmoidoscope should not deter the primary care physician from including the flexible sigmoidoscope in his or her diagnostic armamentarium and from becoming properly trained in its use. By following biopsy and polypectomy precautions and proper flexible sigmoidoscope procedure, risks can be kept to a minimum. Widespread application of flexible sigmoidoscopy could prevent morbidity as well as save lives.

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