

Use of Rigid and Flexible Sigmoidoscopy by Family Physicians in the United States

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To investigate the incidence of use of the flexible and rigid proctosigmoidoscopes by family physicians, a questionnaire was mailed to 1,585 randomly selected members of the American Academy of Family Physicians. Of the total of 1,057 respondents, 48 percent performed sigmoidoscopy, with 30 percent performing flexible sigmoidoscopy, 31 percent performing rigid sigmoidoscopy, and 48 percent performing at least one of the procedures. Younger physicians were found to be more likely to perform flexible sigmoidoscopy, as were physicians who practice in communities of fewer than 500,000 population. Nationwide, more of the flexible procedures are performed in the hospital than in private offices, although physicians in communities of more than 500,000 were more likely to use the sigmoidoscope in their offices. Board-certified physicians were more likely to perform one or both procedures than were noncertified physicians.

Since 1974 sigmoidoscopy has been advocated as a screening tool for carcinoma of the colon.¹⁻⁴ The use of the rigid sigmoidoscope as a screening device, however, has in part been limited by patient discomfort as well as a limited pathologic yield related to the proximal location of a large proportion of colon lesions.⁵ With the advent of flexible sigmoidoscopy, patient comfort is improved, pathologic yield improved, and physicians have become more willing to accept and perform the procedure.⁶⁻¹² Primary care physicians interested in using the flexible sigmoidoscope can be easily trained in the procedure, as has been demonstrated in several studies.^{7,8,13-16}

An extensive review of the literature revealed that there have been reports documenting the use of the flexible instrument in specific practice areas,^{7-9,14,17,18} but that there have been few reports of the incidence of the use of these instruments nationally.⁶ A search of the literature also failed to reveal any analyses of variables that might predict whether physicians perform either rigid or flexible sigmoidoscopy. Intuitively, several variables such as the length of time the physician has practiced medicine, whether he or she is board certified, and the size of the community in which the physician practices, would ap-

pear to be possible factors influencing the use of sigmoidoscopy. With a better understanding of the present extent to which sigmoidoscopy is being performed by American family physicians, as well as what factors might predict whether physicians perform either rigid or flexible sigmoidoscopy, educational programs might be better tailored to familiarize physicians with not only the use of the instruments but also the value of performing the procedures to screen for carcinoma of the colon. A study was initiated to determine the sigmoidoscopy practices of a group of family physicians randomly selected from the active membership of the American Academy of Family Physicians. Specifically, data were collected to address the following questions:

1. What proportion of American family physicians perform sigmoidoscopy using a rigid or a flexible sigmoidoscope?
2. For those physicians who perform the procedure, how often is the rigid sigmoidoscope used each month? How often is the flexible sigmoidoscope used each month?
3. Is there a correlation between the year of graduation from medical school and whether family physicians perform either flexible sigmoidoscopy or rigid sigmoidoscopy?
4. Is there a correlation between the population size of the community in which the physician practices and whether he or she performs flexible or rigid sigmoidoscopy?

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5. Where are sigmoidoscopy procedures being performed—in hospitals or in private offices? Does this pattern vary in different sized communities?

6. Is there a correlation between whether a family physician is board certified and whether he or she performs flexible or rigid sigmoidoscopy?

METHODS

A questionnaire regarding proctosigmoidoscopy equipment usage, cleaning, and disinfection was developed by the investigators. The initial form was subjected to three series of pilot testing and revision based on results of interviews with medical personnel responsible for maintaining the equipment and telephone interviews with a group of physicians who perform flexible sigmoidoscopy. The procedures used in the development of the questionnaire and its distribution were modeled after those outlined by Dillman.¹⁹

In June of 1986 the questionnaire and a cover letter were sent to 1,585 randomly selected members of the American Academy of Family Physicians (AAFP), representing approximately 5 percent of the active membership of 35,002. One week after the initial mailing, a reminder card was mailed to all subjects. Two weeks after the reminder card was sent, a second cover letter and questionnaire were mailed to all nonrespondents. Seven weeks after the initial mailing, 375 randomly selected nonrespondents (approximately 50 percent of all nonrespondents) were sent questionnaires by certified mail. Approximately four months after the initial survey, a research assistant attempted to contact by telephone 20 of those who had failed to respond to the three mailings.

Frequency-of-use statistics were computed. The relationships between use and various independent variables were determined by performing chi-square tests, Student *t* tests, and Pearson correlation coefficients and eta-square computations.

RESULTS

A total of 1,057 of the 1,585 surveyed physicians (66.7 percent) responded to the survey. Of those responding, 507 (48 percent) performed flexible or rigid sigmoidoscopy, with 307 (29 percent) performing flexible sigmoidoscopy and 332 (31 percent) performing rigid sigmoidoscopy.

Family physicians who use the flexible sigmoidoscope reported performing the procedure an average of 7.9 times per month. Physicians using the rigid sigmoidoscope reported performing that procedure an average of 4.8 times

TABLE 1. FAMILY PHYSICIAN USE OF RIGID SIGMOIDOSCOPY BY POPULATION SIZE OF THE COMMUNITY SERVED

Community Population Size	Family Physicians		Total No. (%)
	Using No. (%)	Not Using (No. (%))	
0 to 24,999	117 (34)	223 (66)	340 (100)
25,000 to 49,999	57 (34)	109 (66)	166 (100)
50,000 to 99,999	47 (36)	85 (64)	132 (100)
100,000 to 499,999	58 (38)	96 (62)	154 (100)
500,000+	53 (41)	77 (59)	130 (100)
Total	332 (36)	590 (64)	922 (100)

$\chi^2 = 2.060$; $df = 5$
Critical value ($\alpha .05$) = 11.07

per month. There is, therefore, a statistically significant difference in the number of flexible and rigid sigmoidoscopies performed per physician per month ($t = 3.03$). No significant correlation was observed between the proportion of physicians who perform rigid sigmoidoscopy and the date the physician graduated from medical school ($r = .21$). There was, however, an apparent trend toward decreasing use of the rigid sigmoidoscope in individuals who graduated more recently. On the other hand, there was a statistically significant positive correlation between the proportion of physicians who used the flexible sigmoidoscope and the date of graduation ($r = 0.58$). The year of graduation therefore accounts for 34 percent ($r^2 = .336$) of the variability in the percentage of individuals performing flexible sigmoidoscopy.

No statistically significant difference between the observed and expected frequencies of individuals who perform rigid sigmoidoscopy and the population size of the community served was observed (chi-square = 2.060) (Table 1). In contrast, there is a statistically significant difference between the observed and expected frequencies of individuals who perform flexible sigmoidoscopy and the population size of the community served (chi-square = 27.78). In communities of less than 500,000 there was no apparent relationship between these two variables. The data were therefore collapsed into two categories (<500,000 vs >500,000), and the proportion of physicians performing the procedure in the larger communities was observed to be significantly less than predicted (chi-square = 10.02).

There is a statistically significant difference between the observed and expected frequencies of individuals who perform flexible sigmoidoscopy in private offices vs hospitals within the population ranges selected for this study (chi-square = 14.59) (Table 2). The differences are the greatest for physicians in the communities at the two ex-

TABLE 2. SITES OF FLEXIBLE SIGMOIDOSCOPY USE BY POPULATION SIZE OF THE COMMUNITY SERVED

Community Population Size	Site*		Total No. (%)
	Private Office No. (%)	Hospital No. (%)	
0 to 24,999	72 (55)	58 (45)	130 (100)
25,000 to 49,999	39 (78)	11 (22)	50 (100)
50,000 to 99,999	37 (71)	15 (29)	52 (100)
100,000 to 499,999	43 (70)	18 (30)	61 (100)
500,000+	21 (84)	4 (16)	25 (100)
Total	212 (67)	106 (33)	318 (100)

* The proportion of individuals performing the procedure at sites other than office or hospital was so small—11 of 329 (3.3%)—that these individuals were discarded for this analysis
 $\chi^2 = 14.59$; $df = 4$
 Critical value ($\alpha .05$) = 9.488

tremes of population size, with the physicians in the most rural category being more likely to perform the flexible procedure in the hospital setting than physicians in the other population categories. Conversely, the proportion of family physicians performing flexible sigmoidoscopy in the hospital setting as opposed to private offices was significantly less than expected in communities of more than 500,000. In addition, a statistically significant difference was noted in the actual number of office procedures per physician performing the flexible procedure per month (mean = 7.95) as opposed to the number performed in the hospital setting (mean = 5.6) ($t = 1.944$).

Finally, for both rigid and flexible sigmoidoscopy procedures, a statistically significant difference was observed between the proportion of board-certified (260 of 757) and noncertified (46 of 262) physicians performing sigmoidoscopy (flexible, chi-square = 26.11; rigid, chi-square = 244.62).

DISCUSSION

Of the 1,057 family physicians who responded to the survey, 48 percent perform either flexible or rigid sigmoidoscopy. This finding varies from the reported 71 percent of family physicians performing proctosigmoidoscopy in the study performed by the American Cancer Society.⁶ The proportion of individuals performing flexible sigmoidoscopy was similar to that proportion performing the rigid procedure.

Based on the frequencies reported by all respondents in this study, approximately 83,000 flexible sigmoidoscopy and 55,000 rigid sigmoidoscopy procedures are performed by family physicians in the United States per month. Ap-

proximately 1,650,000 sigmoidoscopies are performed, therefore, by these physicians annually, for an average of 8.0 procedures per month, which is higher than previously reported.⁶ Those physicians who use the flexible sigmoidoscope reported performing significantly more sigmoidoscopies per month than did those who use the rigid sigmoidoscope. This observation may reflect an increased acceptance of the flexible sigmoidoscopy procedure by family physicians and perhaps by patients as well.

The number of physicians performing rigid sigmoidoscopy does not appear to be related to the size of the community the physician serves. For the flexible procedure, however, physicians who practice in large metropolitan communities with populations greater than 500,000 were less likely to perform the procedure than physicians serving smaller communities. This finding could be explained by a difference in the type of practice, ie, group, solo, health maintenance organization, or urgent care, or by the increased availability of consultants performing the procedure in these metropolitan areas. Although the present study did not address the issue of practice type, the lack of a similar difference in the frequency of use of rigid sigmoidoscopes by rural and metropolitan physicians suggests that practice style does not explain the population-related difference in the frequency of flexible sigmoidoscopies performed.

The tendency in smaller communities toward performing flexible sigmoidoscopy in the hospital setting was not anticipated. This tendency may reflect a lack of available colonoscopes or trained endoscopists. The cost of the equipment is assumed to be a major deterrent to its purchase by physicians who do not perform the procedure frequently. During the telephone surveys it was discovered that a number of hospitals in smaller communities in the state of Georgia have entered into agreements with local physicians in which the hospital has agreed to purchase the required endoscopic equipment and the physicians have agreed to perform the procedures in an ambulatory setting in the hospital. The increased number of hospital-based procedures found in this study may reflect similar arrangements in other regions of the country. Although this type of agreement may decrease the cost to the physician, it seems likely that performing the procedure in the hospital increases the cost to the patient, thereby having a negative impact on the value of the sigmoidoscope as a screening tool. Further research should determine the extent to which sigmoidoscopes in hospital ambulatory centers are used for screening.

Physicians who have been in practice longer were more likely to perform rigid sigmoidoscopy and less likely to perform flexible sigmoidoscopy. The older physicians are probably more comfortable using the rigid sigmoidoscope because of their longer experience with that instrument. They are also less likely to have had experience with the

flexible instrument during their training. For those physicians nearing retirement, the considerable cost of the equipment and training required to use the flexible sigmoidoscope may dissuade many from learning to perform the procedure.

Board-certified family physicians were more likely than physicians who were not board certified to perform both rigid and flexible sigmoidoscopy. Given the requirement for the documentation of clinical activity to maintain board certification, board-certified family physicians would be more likely to be in an active, broad-based medical practice than would family physicians not board certified. The frequency at which these procedures are performed may also be affected by practice type.

CONCLUSIONS

The value of sigmoidoscopy as a screening tool is widely accepted among the medical community. Perhaps the most troubling finding of this study, therefore, is that one half of American family physicians do not perform either rigid or flexible sigmoidoscopy. Perhaps there is a substantial proportion of the patients of these physicians for whom sigmoidoscopy is appropriate but who do not receive this procedure either from their family physician or by subsequent referral. If the proportion of family physicians performing sigmoidoscopy were significantly increased, the potential for reducing the incidence of carcinoma of the colon could therefore be substantially enhanced. A nationwide emphasis should be placed on educational programs that teach physicians how to perform the technique and address physician bias against the procedure. In particular, use of the 35-cm and 65-cm flexible sigmoidoscope should be promoted, since these increase both patient comfort and pathologic yield. Given the less frequent use of sigmoidoscopy by family physicians in urban areas and the less frequent use of flexible sigmoidoscopy by older family physicians, it might also be useful to target these groups for educational programs.

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