

Teaching Sigmoidoscopy to Primary Care Physicians: A Controlled Study of Continuing Medical Education

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A sigmoidoscopy skills preceptorship was developed for physicians to increase the rate of sigmoidoscopy by physicians in a health maintenance organization. The preceptorship was designed as a randomized, controlled study of continuing medical education. Baseline sigmoidoscopy rates of participating physicians were similar to those of nonparticipants, as were selected demographic and professional characteristics. Physicians randomized to receive sigmoidoscopy training significantly increased their rate of sigmoidoscopy when compared with controls. The proportion of barium enemas accompanied by sigmoidoscopy likewise increased. All physicians who participated improved when compared with nonparticipants. The sigmoidoscopy skills preceptorship appears to be a worthwhile endeavor in continuing medical education.

An extensive literature has examined the premise that continuing medical education (CME) improves physicians' performance and thereby the quality of medical care. Doubt still remains that CME is effective.¹⁻³ CME courses are available to teach motor skills to practicing physicians, but few have been studied in a controlled manner or objectively evaluated.^{4,5} Although sigmoidoscopy is a widely used diagnostic procedure and has been taught in at least one CME course, no controlled studies are available concerning the effectiveness of teaching sigmoidoscopy.⁶ The present controlled study was undertaken at a health maintenance organization and was designed to test the

hypothesis that physicians who need to learn sigmoidoscopy will volunteer to do so and that learning sigmoidoscopy will lead to a change in practice behavior.

Study Background

Group Health Cooperative of Puget Sound is a prepaid HMO serving 280,000 patients. Outpatient sigmoidoscopy is done by physicians at nine clinics and by a gastroenterology nurse practitioner in a central specialty center. With supervision by a gastroenterologist, the nurse performs three to four sigmoidoscopies each afternoon. Because of the clustering of sigmoidoscopies in one location, it is convenient to teach (or reteach) sigmoidoscopy.

The Group Health Cooperative adopted a computerized panel system in 1978. Each primary physician builds up a defined panel of approx-

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imately 1,800 patients and is responsible for most of their care (including office procedures), with referral to other specialists as necessary. A survey of primary physicians, surgeons, and gastroenterologists at Group Health determined that a program to teach and upgrade skills in sigmoidoscopy for primary physicians was desirable. A sigmoidoscopy skills preceptorship was developed in 1979 with a program evaluation to assess its usefulness. Each preceptorship took place on two consecutive afternoons. Participating physicians performed at least seven sigmoidoscopies with the nurse practitioner. In addition, the physician was given a brief didactic review and participated in a discussion with the gastroenterologist at the end of the session. During this encounter, two points were always emphasized: (1) all patients with symptoms and signs potentially referable to the lower bowel should have sigmoidoscopy, and (2) almost all patients requiring barium enema will need sigmoidoscopy. Eight hours of category 1 CME credit were awarded to each participant.

Methods

The evaluation uses an experimental and quasiexperimental design⁷ to assess changes in performance related to the sigmoidoscopy skills preceptorship. Three groups of physicians were generated: (1) physicians signing up for the preceptorship (randomly allocated to receive training first), (2) physicians signing up for the preceptorship (randomly allocated to receive training at a later date), and (3) physicians not signing up. Only the 100 primary physicians who had been at the Group Health Cooperative for at least six months before the study and who continued to work at Group Health throughout the duration of the study were included in the analysis. The availability of the preceptorship was widely advertised during a two-month period. The 26 physicians signing up were randomly divided into two groups, with 13 chosen to receive training first.

The number of sigmoidoscopies done by the 100 primary physicians was recorded by clinic nurses. The physician's panel size was also determined and a sigmoidoscopy rate was determined (rate =

number of sigmoidoscopies per panel size per 1,000 patients 40 years of age or older). Using patients aged 40 years or older was an attempt to adjust for the fact that older patients may require more frequent sigmoidoscopy. Sigmoidoscopy rate was determined for each physician group at each observation period to determine whether the preceptorship changed performance and to see whether volunteers had lower initial sigmoidoscopy rates and thus a "need to learn" sigmoidoscopy.

Data were also collected to determine the ratio of sigmoidoscopy to barium enemas for each physician group. All barium enemas performed during each observation period were collected from radiology files. Charts were then reviewed to determine how many of these patients had a sigmoidoscopy examination within six months of the barium enema. The sigmoidoscopy-to-barium enema ratio was calculated for each physician group at each observation period to determine whether the preceptorship changed the ratio.

Information on the age, sex, years of postgraduate training, number of years worked at Group Health, and board certification was collected to compare characteristics of physicians choosing the sigmoidoscopy skills preceptorship with those not signing up.

Paired and unpaired *t* tests and the chi-square test were used as appropriate to determine significant differences in study groups and in performance during each observation period.⁸

Results

Physicians signing up for the sigmoidoscopy skills preceptorship did not differ significantly from the others in age, sex, years of postgraduate training, years at Group Health, or board certification. Table 1 shows the rate of sigmoidoscopy at each observation period. The group randomized to receive training first significantly improved their sigmoidoscopy rate before the group randomized to receive training later. In the aggregate, both volunteer groups significantly increased their sigmoidoscopy rate in the initial three months following the preceptorship. Volunteers had initial sig-

Table 1. Rate of Sigmoidoscopy Before and After Sigmoidoscopy Skills Preceptorship		
Physicians Studied	3 Months Before Preceptorship	3 Months After Preceptorship
First study group (n=13)	9.8	13.5*, †
Second study group (n=13)	6.2	8.4
Control group (no training) (n = 74)	8.5	7.4
Note: Rate equals the number of sigmoidoscopies per panel size per 1,000 patients aged 40 years and older *P < .05 †Rate 7-10 months after preceptorship, 11.1		

Table 2. Rate of Sigmoidoscopy with Barium Enema Before and After Sigmoidoscopy Skills Preceptorship		
Physicians Studied	3 Months Before Preceptorship	3 Months After Preceptorship
First study group (n = 13)	.62	.90*
Second study group (n = 13)	.59	.79
Control group (no training) (n = 74)	.69	.67
*P < .05		

moidoscopy rates similar to nonvolunteers. Physicians not volunteering for the preceptorship had no change in sigmoidoscopy rate over time. A fall-off in rate was observed for the group taking the preceptorship first when the initial 3 months following the preceptorship were compared with the 7 to 10 months following the preceptorship.

Table 2 gives the results of the sigmoidoscopy-barium enema ratio at each observation period. The group randomized to receive training first significantly improved their sigmoidoscopy-barium enema ratio before those randomized to receive training later. Volunteers improved their ratio overall. Those not volunteering for the preceptorship had no change in ratio over time.

Comment

Physicians signing up for the sigmoidoscopy skills preceptorship were compared with those not signing up in regard to their "need to learn" (defined by low rates of sigmoidoscopy in the baseline period), age, sex, board certification, years of postgraduate training, and number of years at Group Health. Interestingly, the rate of sigmoidoscopy was no lower in the physicians signing up for the preceptorship. Thus, for the aggregate groups, this study shows no evidence that physicians likely to have a greater need to learn sigmoidoscopy will necessarily volunteer to do so. Physicians signing up for the preceptorship tended

to be younger (37.2 vs 40.5 years of age) and to have worked less time at Group Health (4.4 vs 8.6 years). Proportionately more women chose the preceptorship. These differences, however, were not significant ($P > .05$).

The results indicate that the preceptorship significantly increased the rate of sigmoidoscopy and the sigmoidoscopy-barium enema ratio in both groups volunteering compared with nonvolunteers. One part of the study compared physicians who were motivated to sign up for the preceptorship, and data were obtained both before and after one half of the physicians (picked randomly) underwent training. This part of the study represents a true experimental design (the pretest-post-test control group design)⁷ and shows that the preceptorship was effective in improving sigmoidoscopy rates and the ratio. The data obtained at the intervals on physicians not signing up for the sigmoidoscopy skills preceptorship provide another control. All participants (both first and second groups) improved their rates of performance.

A falloff in sigmoidoscopy rate was noted 7 to 10 months following the preceptorship compared with the initial 3 months following the preceptorship in the physician group randomized to receive training first. This could have been due to a decreased pool of patients requiring sigmoidoscopy in the physicians' panels. Two studies,^{9,10} using computer models to influence physicians' decisions, have noted a falloff in correct behavior when the computer was removed. The decline in rate noted in the sigmoidoscopy skills study may be due to similar falloff. It should be noted that if Group Health were to follow the newest American Cancer Society recommendations for colon cancer screening, and if all eligible patients visiting a physician agreed to such screening, the rate per primary physician would approach 18 sigmoidoscopies per 1,000 patients aged over 40 years per three-month period.¹¹ This rate is far higher than the rate for all indications noted during the three months following the preceptorship.

Does this study address the quality of medical care? Outcomes of care were not examined, but if more sigmoidoscopy will lead to earlier diagnosis of colon cancer and more appropriate treatment of other large intestinal diseases, then more is better. In addition, the didactic material and the discussion with the gastroenterologist may have led to increased knowledge of colon disease in general.

Finally, the use of sigmoidoscopy with barium enema is generally considered to be an important parameter of quality. Although the advent of flexible fiberoptic colonoscopy¹² and the availability of allied health professionals to do more routine sigmoidoscopy¹³ may change the need for primary care physicians to perform this procedure, at present sigmoidoscopy is underused, and there is a need for more physicians to feel comfortable doing this procedure.⁶

This study of a sigmoidoscopy skills preceptorship has shown that such a program increases the rate of sigmoidoscopies done by physicians and improves the process of medical care (at least over the short term). It further shows that controlled studies of CME in a motor skill are feasible. Finally, it demonstrates that it is not possible to easily predict which physicians choose such CME based on prior performance, rates, age, sex, or training.

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