

# Colorectal Screening after Polypectomy: A National Survey Study of Primary Care Physicians

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**Background:** Recommendations by primary care physicians for colorectal screening after polypectomy will influence rates of colonoscopy in open-access systems that do not require consultation by a gastroenterologist before colonoscopy.

**Objective:** To determine the surveillance recommendations of primary care physicians after polypectomy and compare them with recommendations from the U.S. Multisociety Task Force on Colorectal Cancer.

**Design:** Cross-sectional study of physicians.

**Setting:** United States.

**Participants:** A random sample of 500 physicians from the American College of Physicians and 500 physicians from the American Academy of Family Physicians, obtained by using a mail survey.

**Measurements:** Physicians were asked when they would recommend repeated colonoscopy for a hypothetical 55-year-old man with no family history of colorectal cancer after the following 6 results on colonoscopy: hyperplastic polyp, one 6-mm tubular ad-

enoma, two 6-mm tubular adenomas, one 12-mm tubulovillous adenoma, one 12-mm tubular adenoma with focal high-grade dysplasia, and no polyp but a previous tubular adenoma.

**Results:** The overall response rate was 57% (568 physicians). Of the respondents, 48% were internists and 52% were family practitioners. Sixty-one percent of respondents would survey a hyperplastic polyp in 5 years or less, 71% would survey a single tubular adenoma in 3 years or less, and 80% would survey 2 tubular adenomas in 3 years or less.

**Limitations:** The results are based on physicians' self-reported practices from clinical vignettes and may not match actual practice.

**Conclusion:** Primary care physicians recommend postpolypectomy colonoscopic surveillance more frequently than is recommended by practice guidelines, especially if the colonoscopy showed a hyperplastic polyp or a single small adenoma.

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Colonoscopy has been increasingly endorsed to screen for colorectal cancer in persons at average risk who are older than 50 years of age (1–9). As a result, detection and surveillance of polyps are increasing and represent the single most common use for colonoscopy in patients older than 50 years of age (10). However, there is concern that current physician manpower and endoscopic resources may not meet the demands for both surveillance and screening colonoscopy (4, 9, 11–14).

One potential approach to accommodate the demand for screening colonoscopy is to increase the surveillance intervals after identification of adenomatous polyps. Current guidelines by the U.S. Multisociety Task Force (USMSTF) on Colorectal Cancer suggest that average-risk persons with 1 or 2 small adenomas (<1 cm) should have surveillance colonoscopy after 5 to 10 years (4, 9). In patients with 3 or more adenomas, regardless of size, a 3-year surveillance interval is recommended (4, 9). Preliminary evidence indicates that even these intervals should be lengthened because the risk for colorectal cancer after removal of adenomas may be no greater than that in the general population (15, 16). Hyperplastic polyps are non-neoplastic polyps that have been identified in 10% of persons undergoing screening and are considered low risk for development of colon neoplasia (6, 7). Current recommendations are that these patients have surveillance examinations every 10 years (1, 4, 5, 9).

Despite efforts to lengthen surveillance intervals, evidence indicates that physicians may still recommend more intensive follow-up colonoscopy. A recent survey of gastro-

enterologists and surgeons reported that 24% of gastroenterologists would recommend surveillance for a hyperplastic polyp in 5 years or less and most would recommend surveillance of a single adenoma in 3 years or less (17). However, in open-access endoscopy referral systems, in which physicians can refer patients for endoscopic examinations without previous consultations, decisions about follow-up are made by referring primary care physicians rather than gastroenterologists (18). There is concern that primary care physicians may be less familiar than gastroenterologists with surveillance guidelines (19), and in particular with frequently changing surveillance recommendations. We examined the interval at which primary care physicians refer patients for surveillance after a polyp is found on index colonoscopy and compared these intervals with those recommended in current guidelines.

See also:

#### Print

Editors' Notes . . . . . 655  
Summary for Patients . . . . . I-26

#### Web-Only

Appendix Figures  
Conversion of figures and tables into slides

## METHODS

### Survey Development

A 1-page cover letter (Appendix Figure 1, available at [www.annals.org](http://www.annals.org)) and survey (Appendix Figure 2, available at [www.annals.org](http://www.annals.org)) were developed and tested on primary care physicians within our institution. Questions that resulted in ambiguous answers were adjusted. All questions were created in a close-ended manner.

The survey included the following hypothetical clinical history for all questions. The patient was a 55-year-old man in good health who underwent a screening colonoscopy. The colonoscopy was completed to the cecum, the quality of the colon cleansing was excellent, and the patient had no family history of colon cancer. The findings on index colonoscopy varied on individual questions and included a 6-mm hyperplastic polyp, a 6-mm tubular adenoma, two 6-mm tubular adenomas, a 12-mm tubulovillous adenoma, or a 12-mm pedunculated tubular adenoma with a focus of high-grade dysplasia. One vignette included a 55-year-old man with a 12-mm tubular adenoma on screening colonoscopy 3 years earlier who underwent surveillance colonoscopy on which no polyps were found. The practitioners were asked to select the follow-up interval that they would recommend from the following choices: colonoscopy at 6 months, colonoscopy at 1 year, colonoscopy at 3 years, colonoscopy at 5 years, colonoscopy at 10 years, or no repeated colonoscopy.

### Recruitment

A simple random sample of 500 family practitioners and 500 general internists was obtained from among active, nonretired members of the American College of Physicians (ACP) and the American Academy of Family Physicians (AAFP) in 2004. Because specialty type is an identifiable characteristic in the membership, only physicians designated as general internists were requested from the ACP membership.

### Survey Administration

An initial mailing that included the cover letter and questionnaire was sent to the random sample. A repeated mailing that included a \$2 bill as an incentive was sent to physicians who did not respond after 6 weeks. To maximize response rates, the total design approach (20) was used. This approach included personalized cover letters, first-class stamps on the envelopes, enclosed first-class stamped return envelopes, close-ended questions, and a financial incentive on the repeated mailing.

### Statistical Analysis

Data analysis was performed by using SAS for Windows, version 8 (SAS Institute, Inc., Cary, North Carolina). Descriptive statistics were performed on all variables. Frequencies of different answers to each question on the survey were calculated. Comparisons were made by using the chi-square test according to sex (male or female), specialty (family practitioners or internists), years in practice

### Context

In many health systems, primary care physicians schedule surveillance colonoscopy after polyp removal. Their knowledge of the recommended surveillance intervals will affect the availability of colonoscopy resources.

### Contribution

The authors surveyed a random sample of internists and family physicians by sending them a vignette that depicted a man with polyps on screening colonoscopy. Respondents chose a surveillance colonoscopy interval for each of several screening findings. Most respondents chose shorter surveillance intervals than recommended by professional society guidelines.

### Cautions

A survey tests knowledge, not actual practice. The response rate was 57%.

### Implications

Primary care physicians may order surveillance colonoscopy more frequently than necessary.

—The Editors

(<5 years, 5 to 10 years, 11 to 20 years, or >20 years), average number of patients seen in a week (<25, 25 to 50, 51 to 100, or >100) and routine use of an open-access colonoscopy system in their practice. A *P* value less than 0.01 was considered statistically significant for any difference in answers between groups to correct for multiple comparisons between groups. Paired responses were determined by using the McNemar test.

### Role of the Funding Source

The study was funded by general research funds from the Division of Gastroenterology at University Hospitals of Cleveland, which had no role in the design, conduct, or reporting of the study or in the decision to submit the manuscript for publication.

## RESULTS

### Survey Response and Physician Characteristics

The overall response rate for both mailings was 57% (568 physicians). Three hundred thirty-seven responses were received after the first mailing, and 231 responses were received after the second mailing. Four hundred thirty-two (43%) responses were not received, including 202 responses from AAFP members and 230 from ACP members. Table 1 shows characteristics of the respondents. No information is available on characteristics of nonresponders other than whether they were members of ACP or AAFP.

### Recommendations and Comparisons with USMSTF Guidelines

Table 2 shows the USMSTF guidelines at the time of the survey for each of the 6 clinical vignettes. Surveillance

**Table 1. Characteristics of Survey Respondents**

Characteristics	Physicians, n (%)*
<b>Overall response</b>	568 (57)
<b>Sex</b>	
Male	346 (61)
Female	147 (26)
Unknown	75 (13)
<b>Specialty</b>	
Family medicine	298 (52)
Internal medicine	270 (48)
<b>Years in practice</b>	
<5	37 (7)
5–10	92 (16)
11–20	182 (32)
>20	247 (44)
<b>Number of patients seen per week</b>	
<25	45 (8)
25–50	64 (11)
51–100	256 (45)
>100	176 (31)
<b>Use of open-access colonoscopy</b>	377 (66)

\* Sample sizes vary because of missing responses.

intervals recommended by the practitioners for various lesions identified on the index colonoscopy are also shown (Table 2). The intervals recommended by primary care physicians were generally shorter than those recommended by the USMSTF.

#### Follow-Up Recommendations for Low-Risk Lesions

Sixty-one percent of primary care physicians would survey a single 6-mm hyperplastic polyp in the sigmoid colon in 5 years or less (Table 2), and 71% would survey a single 6-mm tubular adenoma found in the sigmoid colon in 3 years or less. Similarly, 80% of primary care physicians would survey two 6-mm tubular adenomas in the sigmoid colon in 3 years or less. Furthermore, physicians were more

likely to survey 2 adenomas than 1 adenoma at 1 year or less (37% vs. 25% [ $P < 0.001$ , McNemar test]) (Table 2). Eighty percent of primary care physicians would survey a patient who had a normal result on surveillance colonoscopy and a history of a 12-mm tubular adenoma 3 years earlier in 5 years or less (Table 2).

#### Follow-Up Recommendations for High-Risk Lesions

Fifty-nine percent of primary care physicians would survey a single 12-mm tubulovillous adenoma in the sigmoid colon in 1 year or less (Table 2). For follow-up of a single 12-mm pedunculated polyp with a focus of high-grade dysplasia away from the cautery margin, 85% would survey the patient in 1 year or less (Table 2). The differences in surveillance patterns between these 2 types of polyps were statistically significant at 1 year or less ( $P < 0.001$ , McNemar test).

#### Physician Characteristics Associated with Recommendations

Family practitioners were more likely than internists to recommend surveillance for a hyperplastic polyp at 1 year or less (19% vs. 10%) and 3 years (21% vs. 13%) ( $P = 0.001$  for both comparisons). Internists were more likely than family practitioners to recommend surveillance for hyperplastic polyps at 5 years or more (76% vs. 60% [ $P = 0.001$ ]). Otherwise, no consistent differences were found in surveillance of hyperplastic polyps, small adenomas, and high-risk polyps according to the sex of the physician, number of years in practice, number of patients seen per week, and use of open-access colonoscopy.

#### Characteristics of Respondents to Each Mailing

Physicians who responded to the second mailing were more likely than those who responded to the first mailing to recommend surveillance intervals of 3 years or less for a tubulovillous adenoma (96% vs. 91% [ $P = 0.003$ ]). Otherwise, no consistent differences were found in surveillance of hyperplastic polyps, small adenomas, and high-risk polyps between respondents to each mailing.

**Table 2. Postpolypectomy Surveillance by Primary Care Physicians, Compared with Guideline Recommendations**

Clinical Scenario	2003 U.S. Multisociety Task Force Recommendation†	Physicians Who Recommended Surveillance, %*			
		In ≤1 Year	In 3 Years	In 5 Years	In >5 Years
6-mm hyperplastic polyp	No specific interval‡	16	16	29	35
6-mm tubular adenoma	5 years	25	46	23	3
12-mm tubular adenoma with high-grade dysplasia	Not specifically addressed§	85	12	2	1
12-mm tubulovillous adenoma	3 years	59	33	6	1
Two 6-mm tubular adenomas	5 years	37	43	15	1
No polyps in a patient with a 12-mm tubular adenoma 3 years earlier	5 years	2	21	57	18

\* Of physicians who responded to the questionnaire, the following number did not answer each particular vignette: hyperplastic polyp, 19; 6-mm tubular adenoma, 18; tubular adenoma with high-grade dysplasia, 20; tubulovillous adenoma; 22; 2 tubular adenomas, 21; no polyps after adenoma, 20.

† Reference 4.

‡ "Current evidence suggests that the risk of advanced proximal neoplasia in persons with only hyperplastic polyps in the distal colon is comparable to the risk in persons with no distal polyps" (4).

§ "Patients who had numerous adenomas, a malignant adenoma (with invasive cancer), a large sessile adenoma or an incomplete colonoscopy should have a short interval follow-up colonoscopy based upon clinical judgment" (4).

## DISCUSSION

A growing body of evidence indicates that physicians recommend surveillance of polyps in excess of guidelines (4, 11, 17, 21). Compared with a study by Mysliwiec and colleagues (17) in which 24% of gastroenterologists and 54% of general surgeons recommended surveillance of a hyperplastic polyp, of which the majority would perform colonoscopy in 5 years or less, we found that 61% of primary care physicians recommend surveillance of a hyperplastic polyp in 5 years or less. In that study, 97% of gastroenterologists and 89% of general surgeons recommended surveillance of small adenomas, and the majority would perform colonoscopy in 3 years or less (17). We found that 71% of primary care physicians recommend surveillance of a small adenoma in 3 years or less. Whereas Mysliwiec and colleagues surveyed gastroenterologists and surgeons (17), we examined the recommendations of primary care physicians in surveillance of polyps after an index colonoscopy. This group may be a more relevant one to survey in the era of open-access endoscopy, in which primary care practitioners make decisions about surveillance. We found that primary care physicians frequently recommended relatively close follow-up for lesions at low risk for subsequent cancer, including hyperplastic polyps and 1 or 2 small tubular adenomas. These surveillance recommendations are concerning and, if they truly reflect actual practice, represent a potential overutilization of limited colonoscopy resources in low-risk patients.

Primary care physicians may refer for surveillance more frequently than published guidelines for several reasons, including medical liability and unawareness of current guidelines. One study has shown that the miss rate for adenomas may be substantial (up to 24%) (22). In patients with 1 or 2 small adenomas, physicians may cautiously overrefer for surveillance because the finding of more adenomas that may have been missed would place these patients in a higher risk category. The constantly changing guidelines that possibly reflect new evidence may also confuse primary care practitioners. A single set of consensus guidelines endorsed by all societies with clearly summarized recommendations could decrease this confusion. In addition, review by endoscopists of open-access colonoscopy referrals to conform to current guidelines may further educate referring physicians. In a recent study of gastroenterologists, a relatively simple intervention of reinforcing summarized guidelines through continuous quality improvement led to improved compliance with guidelines, to 81% from 57%, with an associated savings in cost by decreasing the total number of colonoscopies (23).

The confusion over constantly changing guidelines from several societies remains problematic for the primary care practitioner. Guideline recommendations to lengthen surveillance intervals after removal of small tubular adenomas are based primarily on the initial results of the National Polyp Study, published in 1993 (15), and an analysis

that extended follow-up to 6 years, which documented a low incidence of advanced adenomas on subsequent colonoscopy (24). In addition, an analysis of data from the Veterans Affairs Cooperative Study on screening colonoscopy documented a low rate of significant neoplasia among patients with an adenoma less than 1 cm in size removed on screening colonoscopy 5 years earlier (25). The most recent set of guidelines released from USMSTF on Colorectal Cancer at the time of the mailing of the survey was in 2003. These guidelines were a combined effort of the American College of Gastroenterology, American Society of Gastrointestinal Endoscopy, the American Gastrointestinal Association, and ACP and included representatives from the AAFP, the American College of Radiology, and the American Society of Colorectal Surgeons (4). Many of these societies and the American Cancer Society have released guidelines that address polyp surveillance (8). In the USMSTF guidelines from 2003, surveillance of 1 or 2 small adenomas was extended from 3 years to 5 years (4). It seems reasonable that physicians may not be up to date on these most recent recommended changes in surveillance intervals.

In 2006, the USMSTF on Colorectal Cancer updated the guidelines for postpolypectomy surveillance, in order to address the fact that surveillance is becoming a large part of endoscopic practice (9). These newer guidelines were a collaborative effort between the USMSTF and the American Cancer Society (9). Major changes in the new guidelines included discouraging surveillance of hyperplastic polyps and lengthening the intervals of surveillance for 1 or 2 small adenomas to 5 to 10 years (9). These guidelines are based on pooled analysis from randomized, controlled trials, observational cohort studies, and chemoprevention trials (9).

The intense surveillance of low-risk polyps would compromise the current capacity to perform screening colonoscopy. Currently, 30% to 40% of persons older than 50 years of age undergo colon cancer screening (26). As awareness of colon cancer screening increases, the manpower to perform colonoscopy for screening and surveillance may be exceeded. Suggestions to meet this demand have included shifting resources from surveillance to screening and implementing open-access referral systems. The benefits of open-access endoscopy, including a decrease in cost, could be limited if this procedure leads to a larger number of inappropriate referrals. In a study evaluating a triage system within an open-access endoscopy referral system, one third of referrals from primary care physicians were inappropriate, most of which were for postpolypectomy surveillance (21).

A recent analysis of the Clinical Outcomes Research Initiative database found that among patients 50 to 75 years of age, surveillance of adenomas was the most common indication for colonoscopy (10). These results are concerning because increased screening will lead to increased surveillance, which may exceed recommendations

of current guidelines and the current supply of physicians to perform the procedure. This could lead to increased wait times for screening colonoscopy, as already occurs in some parts of the United States, and delayed evaluation of symptomatic patients.

The benefit of polypectomy and surveillance is a decreased risk for colorectal cancer, but the reduction in risk from surveillance alone after polypectomy remains unclear (15, 16). The prevalence of adenomas remains 30% to 50%, but the incidence of colorectal cancer is 6% (15). In a recent study in which 2915 patients with adenomas were followed in surveillance programs after polypectomy, the rate of cancer diagnosis was 1.74 cases per 1000 person-years, which is 3 times higher than in the National Polyp Study (27). This rate is consistent with results of other studies, including the Polyp Prevention Trial and the Wheat Bran Fiber Trial (28, 29), and it is supported by the Prostate, Lung, Colorectal, and Ovarian Cancer Screening Trial, in which 14% of patients who underwent negative flexible sigmoidoscopy were found to have a polyp or mass at 3 years (30). Although the risk for colorectal cancer may be higher than is suggested by the National Polyp Study, the evidence from observational studies suggests that high-risk polyps, such as multiple adenomas (>3), large adenomas (>1 cm), villous features, and high-grade dysplasia, are the major predictors of future advanced adenomas or cancer (9).

There are inherent limitations to survey research. The results are based only on survey data from clinical vignettes and may not match actual practice. The information cannot be validated because survey respondents remain anonymous. These clinical vignettes do not consider complicated situations, including endoscopic difficulty, patient characteristics, and interest in follow-up. Physicians may have overestimated or underestimated surveillance in our survey compared with actual practice. This survey did not ask physicians to explain their responses, and we can therefore only speculate on reasons for oversurveillance. Also, participants' responses were restricted to close-ended, multiple-choice responses. The study had limited power to detect differences among respondents in demographic groups, such as those in practice for less than 5 years or those with lower patient volume. Our response rate does not include the attitudes of 40% of our initial sample, and responses may systematically differ between respondents and nonrespondents. Furthermore, because we did not specify the practice setting, we cannot validate whether physicians from a particular practice setting responded differently. For example, physicians in a private practice model may face factors, including financial and time pressures, that differ from those in an academic setting. Although written case simulations are frequently used to investigate decision making by physicians, data are limited on the responses as actual measures of practice (31). Nonetheless, vignette responses are believed to be a valid instru-

ment for eliciting attitudes and beliefs, as measured in our study.

In summary, we found that primary care physicians recommend surveillance of hyperplastic polyps and small adenomas in excess of current published guidelines. These findings indicate a potential overutilization of resources in low-risk patients that may affect the capacity to perform primary screening and evaluation of symptomatic patients. The results suggest that changing current referral patterns will require major educational efforts, such as development of clear uniform guidelines endorsed by subspecialty and primary care organizations. Future studies evaluating the reasons that primary care physicians recommend increased surveillance may be needed to further understand current practices.

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## References

1. Bond JH. Polyp guideline: diagnosis, treatment, and surveillance for patients with colorectal polyps. Practice Parameters Committee of the American College of Gastroenterology. *Am J Gastroenterol.* 2000;95:3053-63. [PMID: 11095318]
2. Prajapati DN, Saeian K, Binion DG, Staff DM, Kim JP, Massey BT, et al. Volume and yield of screening colonoscopy at a tertiary medical center after change in Medicare reimbursement. *Am J Gastroenterol.* 2003;98:194-9. [PMID: 12526957]
3. Podolsky DK. Going the distance—the case for true colorectal-cancer screening [Editorial]. *N Engl J Med.* 2000;343:207-8. [PMID: 10900282]
4. Winawer S, Fletcher R, Rex D, Bond J, Burt R, Ferrucci J, et al. Colorectal cancer screening and surveillance: clinical guidelines and rationale—update based on new evidence. *Gastroenterology.* 2003;124:544-60. [PMID: 12557158]
5. Guidelines for colorectal cancer screening and surveillance. *Gastrointest Endosc.* 2000;51:777-82. [PMID: 10840334]
6. Lieberman DA, Weiss DG, Bond JH, Ahnen DJ, Garewal H, Chejfec G. Use of colonoscopy to screen asymptomatic adults for colorectal cancer. Veterans Affairs Cooperative Study Group 380. *N Engl J Med.* 2000;343:162-8. [PMID: 10900274]
7. Imperiale TF, Wagner DR, Lin CY, Larkin GN, Rogge JD, Ransohoff DF.

- Risk of advanced proximal neoplasms in asymptomatic adults according to the distal colorectal findings. *N Engl J Med.* 2000;343:169-74. [PMID: 10900275]
8. **Smith RA, von Eschenbach AC, Wender R, Levin B, Byers T, Rothenberger D, et al.** American Cancer Society guidelines for the early detection of cancer: update of early detection guidelines for prostate, colorectal, and endometrial cancers. Also: update 2001—testing for early lung cancer detection. *CA Cancer J Clin.* 2001;51:38-75. [PMID: 11577479]
  9. **Winawer SJ, Zauber AG, Fletcher RH, Stillman JS, O'Brien MJ, Levin B, et al.** Guidelines for colonoscopy surveillance after polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer and the American Cancer Society. *Gastroenterology.* 2006;130:1872-85. [PMID: 16697750]
  10. **Lieberman DA, Holub J, Eisen G, Kraemer D, Morris CD.** Utilization of colonoscopy in the United States: results from a national consortium. *Gastrointest Endosc.* 2005;62:875-83. [PMID: 16301030]
  11. **Rex DK, Lieberman DA.** Feasibility of colonoscopy screening: discussion of issues and recommendations regarding implementation [Editorial]. *Gastrointest Endosc.* 2001;54:662-7. [PMID: 11677497]
  12. **Brown ML, Klabunde CN, Mysliwiec P.** Current capacity for endoscopic colorectal cancer screening in the United States: data from the National Cancer Institute Survey of Colorectal Cancer Screening Practices. *Am J Med.* 2003;115:129-33. [PMID: 12893399]
  13. **Seeff LC, Manninen DL, Dong FB, Chattopadhyay SK, Nadel MR, Tangka FK, et al.** Is there endoscopic capacity to provide colorectal cancer screening to the unscreened population in the United States? *Gastroenterology.* 2004;127:1661-9. [PMID: 15578502]
  14. **Levin TR.** Colonoscopy capacity: Can we build it? Will they come? [Editorial] *Gastroenterology.* 2004;127:1841-4. [PMID: 15578522]
  15. **Winawer SJ, Zauber AG, O'Brien MJ, Ho MN, Gottlieb L, Sternberg SS, et al.** Randomized comparison of surveillance intervals after colonoscopic removal of newly diagnosed adenomatous polyps. The National Polyp Study Workgroup. *N Engl J Med.* 1993;328:901-6. [PMID: 8446136]
  16. **Winawer SJ, Zauber AG, Ho MN, O'Brien MJ, Gottlieb LS, Sternberg SS, et al.** Prevention of colorectal cancer by colonoscopic polypectomy. The National Polyp Study Workgroup. *N Engl J Med.* 1993;329:1977-81. [PMID: 8247072]
  17. **Mysliwiec PA, Brown ML, Klabunde CN, Ransohoff DF.** Are physicians doing too much colonoscopy? A national survey of colorectal surveillance after polypectomy. *Ann Intern Med.* 2004;141:264-71. [PMID: 15313742]
  18. **Eisen GM, Baron TH, Dominitz JA, Faigel DO, Goldstein JL, Johanson JF, et al.** Open access endoscopy. *Gastrointest Endosc.* 2002;56:793-5. [PMID: 12447287]
  19. **Charles RJ, Chak A, Cooper GS, Wong RC, Sivak MV Jr.** Use of open access in GI endoscopy at an academic medical center. *Gastrointest Endosc.* 1999;50:480-5. [PMID: 10502167]
  20. **Field TS, Cadoret CA, Brown ML, Ford M, Greene SM, Hill D, et al.** Surveying physicians: do components of the "Total Design Approach" to optimizing survey response rates apply to physicians? *Med Care.* 2002;40:596-605. [PMID: 12142775]
  21. **Baron TH, Kimery BD, Sorbi D, Gorkis LC, Leighton JA, Fleischer DE.** Strategies to address increased demand for colonoscopy: guidelines in an open endoscopy practice. *Clin Gastroenterol Hepatol.* 2004;2:178-82. [PMID: 15017624]
  22. **Rex DK, Cutler CS, Lemmel GT, Rahmani EY, Clark DW, Helper DJ, et al.** Colonoscopic miss rates of adenomas determined by back-to-back colonoscopies. *Gastroenterology.* 1997;112:24-8. [PMID: 8978338]
  23. **Sanaka MR, Super DM, Feldman ES, Mullen KD, Ferguson DR, McCullough AJ.** Improving compliance with postpolypectomy surveillance guidelines: an interventional study using a continuous quality improvement initiative. *Gastrointest Endosc.* 2006;63:97-103. [PMID: 16377324]
  24. **Zauber AG, Winawer SJ, Bond J, et al.** Can surveillance intervals be lengthened following colonoscopic polypectomy? [Abstract] *Gastroenterology.* 1997; 112:A50.
  25. **Lieberman DA, Weiss DG.** Five-year surveillance of patients with adenomas or colorectal cancer at screening colonoscopy: results from the VA Cooperative Study #380 [Abstract]. *Gastroenterology.* 2004;126:A22.
  26. Colorectal cancer test use among persons aged > or = 50 years—United States, 2001. *MMWR Morb Mortal Wkly Rep.* 2003;52:193-6. [PMID: 12653456]
  27. **Robertson DJ, Greenberg ER, Beach M, Sandler RS, Ahnen D, Haile RW, et al.** Colorectal cancer in patients under close colonoscopic surveillance. *Gastroenterology.* 2005;129:34-41. [PMID: 16012932]
  28. **Pabby A, Schoen RE, Weissfeld JL, Burt R, Kikendall JW, Lance P, et al.** Analysis of colorectal cancer occurrence during surveillance colonoscopy in the dietary Polyp Prevention Trial. *Gastrointest Endosc.* 2005;61:385-91. [PMID: 15758908]
  29. **Alberts DS, Martínez ME, Roe DJ, Guillén-Rodríguez JM, Marshall JR, van Leeuwen JB, et al.** Lack of effect of a high-fiber cereal supplement on the recurrence of colorectal adenomas. Phoenix Colon Cancer Prevention Physicians' Network. *N Engl J Med.* 2000;342:1156-62. [PMID: 10770980]
  30. **Schoen RE, Pinsky PF, Weissfeld JL, Bresalier RS, Church T, Prorok P, et al.** Results of repeat sigmoidoscopy 3 years after a negative examination. *JAMA.* 2003;290:41-8. [PMID: 12837710]
  31. **Peabody JW, Luck J, Glassman P, Jain S, Hansen J, Spell M, et al.** Measuring the quality of physician practice by using clinical vignettes: a prospective validation study. *Ann Intern Med.* 2004;141:771-80. [PMID: 15545677]

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October 27, 2004

Dear Doctor,

I am a second year internal medicine resident interested in gastroenterology at University Hospitals of Cleveland. Could you please take a few moments out of your busy schedule to help me in my research project?

Colorectal cancer screening and surveillance is a major health care issue in gastroenterology today. Primary care physicians are becoming responsible for referring patients back for repeat surveillance colonoscopy. I am very interested in studying what determines the interval for colonoscopy surveillance in clinical practice.

To this end, I have developed a survey that presents 6 short clinical vignettes. I would appreciate it if you would take **three minutes** to complete the enclosed survey and return it to me in the stamped envelope through the mail. Your responses will be kept completely confidential. If you have any questions you may contact me through email at [vikramboolchand@yahoo.com](mailto:vikramboolchand@yahoo.com) or by telephone at 216-965-7427.

Thank you in advance.

Sincerely,

Vikram Boolchand, MD  
Internal Medicine Resident  
University Hospitals of Cleveland



1. Gender M / F      2. Year of graduation from medical school \_\_\_\_\_

Please answer the following concerning your medical practice.

3. Specialty (circle):      Family Medicine              Internal Medicine              Other \_\_\_\_\_

4. Years in practice:      <5                      5-10                      10-20                      >20

5. Number of patients you see per week:      <25      25-50      50-100                      >100

6. Do you refer patients for colonoscopy without a prior GI consultation (open access colonoscopy)?                      YES                      NO

For all questions assume that colonoscopy was completed to the cecum, that the quality of the colon cleansing preparation was excellent, and that the patient has no family history of colon cancer.

**For questions 7-11:**

A 55 year old male undergoes screening colonoscopy. Assume that he remains in good health and asymptomatic after the colonoscopy. Based on the pathology please indicate the interval at which you would schedule him for repeat colonoscopy.

7. On colonoscopy a single 6 mm polyp is found in the sigmoid colon and removed by snare cautery. On pathology the polyp is found to be a tubular adenoma.

- A. 6 months
- B. 1 year
- C. 3 years
- D. 5 years
- E. 10 years
- F. Repeat colonoscopy not indicated

8. On colonoscopy a single 6 mm polyp is found in the sigmoid colon and removed by snare cautery. On pathology the polyp is found to be a hyperplastic polyp.

- A. 6 months
- B. 1 year
- C. 3 years
- D. 5 years
- E. 10 years
- F. Repeat colonoscopy not indicated

9. On colonoscopy a single 12 mm pedunculated polyp is found in the sigmoid colon and removed by snare cautery. On pathologic evaluation the polyp is found to be a tubular adenoma with focus of high grade dysplasia away from the cautery margin.

- A. 6 months
- B. 1 year
- C. 3 years
- D. 5 years
- E. 10 years
- F. Repeat colonoscopy not indicated

10. On colonoscopy a single 12 mm polyp is found in the sigmoid colon and removed by snare cautery. On pathologic evaluation the polyp is found to be a tubulovillous adenoma.

- A. 6 months
- B. 1 year
- C. 3 years
- D. 5 years
- E. 10 years
- F. Repeat colonoscopy not indicated

11. On colonoscopy two 6 mm polyps are found in the sigmoid colon and removed by snare cautery. On pathology the polyps are found to be tubular adenomas.

- A. 6 months
- B. 1 year
- C. 3 years
- D. 5 years
- E. 10 years
- F. Repeat colonoscopy not indicated

**For question 12:**

A 55 year old male, with a history of a 12 mm tubular adenoma on screening colonoscopy three years prior, undergoes surveillance colonoscopy. He has no family history of colon cancer.

12. On colonoscopy no polyps are found. Assuming he remains in good health and asymptomatic, when would you schedule him for repeat colonoscopy?

- A. 6 months
- B. 1 year
- C. 3 years
- D. 5 years
- E. 10 years
- F. Repeat colonoscopy not indicated