

Research paper

Colorectal cancer screening: a retrospective study of compliance with guidelines in a university-based primary care practice

Ashish Malhotra MD

Medical Resident, Department of Medicine

Khalid Aziz MD

Associate Professor of Medicine, Division of Gastroenterology

James W Freston MD PhD

Professor of Medicine Emeritus, Division of Gastroenterology

University of Connecticut Health Center, Farmington, CT, USA

ABSTRACT

Aim Colorectal cancer is the third most common cancer in the US. Randomised trials have demonstrated the efficacy of screening. Our goal was to determine the compliance among primary care physicians with the American Cancer Society screening guidelines for colorectal cancer and secondarily to determine the reasons for non-compliance.

Methods Two-hundred and twenty-one medical records were randomly selected for this retrospective cohort review. The identification of records was determined by inclusion criterion: (1) all patients born 1950 or before irrespective of co-morbidities; (2) first visit to the clinic in 2000; (3) most recent visit after December 2003, so as to exclude patients who dropped out of the practice or died. The records were examined to answer the following: (1) was screening offered when it was indicated? A 2-year period to complete screening was permitted; (2) was screening completed by any of the approved methods either on time or late? (3) Were abnormal/normal results followed-up according to the guidelines? We allowed a 2-year follow up period. If the answer to any of the above was 'no', non-compliance

was recorded and possible reasons for non-compliance were searched in the medical record.

Results Altogether, 55.6% of the patients were offered screening when it was indicated; 66.5% completed screening either late or on time; abnormal or normal results were followed according to guidelines in 59.2%; and 33.0% had documented compliance. The most common explanation for non-adherence was 'unknown', i.e. the medical record did not provide an explanation (79%), 19.6% declined any screening and 1.4% were non-compliant because of lack of insurance or the presence of co-morbid conditions.

Conclusions The compliance rate in this internal medicine practice was 33.0%. The reasons for non-compliance for the most part remain unknown, but there was substantial patient refusal to be screened, suggesting room for improvement either in patient or physician education, or in documenting recommendations and results.

Keywords: colon cancer prevention, colon cancer screening, CRC screening, guideline compliance

How this fits in with quality in primary care

What do we know?

Colorectal cancer screening has been shown to be an effective and cost-effective preventive measure.

What does this paper add?

Compliance with national recommendations for colorectal cancer screening was generally poor in this study, reflecting poor record keeping and patient refusal of screening.

Introduction

Colorectal cancer (CRC) is the third most common cancer in both men and women, and is the second most common cause of cancer-related deaths in the US.¹ The American Cancer Society (ACS) has estimated that in 2006 there will be 148 610 new cases and 55 170 deaths in the US.¹ The natural history of CRC provides an opportunity for the prevention or early detection of cancer as the progression from adenoma to carcinoma occurs over the course of several years.^{2,3} The survival rate for localised disease is 90%, compared to less than 10% for metastatic disease.^{4,5} Thus, CRC screening is one of the most efficacious cancer screening programmes available today. When discovered early, CRC has very good outcomes. The five-year survival rate for persons diagnosed with stage I disease is over 90%.^{6,7} Randomised trials have demonstrated the efficacy of screening. Faecal occult blood tests (FOBT) reduce mortality by over 30%.⁸ Allowing the removal of precancerous polyps, endoscopic screening decreases CRC incidence by 75–90%.⁹ Therefore, increased screening would result in significant mortality and morbidity benefits, especially for those at increased risk of developing CRC. Despite this, CRC screening rates throughout the country remain dismally low, lagging far behind those of all other cancer screening tests.^{10,11}

Current screening guidelines are stratified by risk level by the ACS. Recommendations for those with no risk factors other than age (average risk) are at age 50 years to begin screening via (1) annual FOBT; (2) flexible sigmoidoscopy every 5 years; (3) annual FOBT plus flexible sigmoidoscopy every 5 years; (4) double contrast barium enema every 5 years; (5) colonoscopy every 10 years. Individuals are at increased risk if they have a family history of CRC or adenomas diagnosed in a first-degree relative (FDR) younger than age 60 years, two or more FDRs diagnosed with CRC at any age, or a personal history of CRC, adenomas or inflammatory bowel disease (IBD). Such individuals should have an examination of their entire colon, preferably with colonoscopy, starting at age 40 or 10 years earlier than the age at diagnosis of the youngest affected relative, whichever is earlier.¹²

Despite the evidence supporting the effectiveness of screening, clear-cut screening guidelines and widespread availability of screening tests, the proportion of the US population aged 50 years or older that has been screened remains low (less than 50%).^{13–16} Compliance on the other hand, defined as adherence to the screening guidelines, has never been reported in the US. Explaining the concept of compliance further, e.g. it is necessary to get FOBT every year, but it is even more important to follow an abnormal result with

colonoscopy, or that one flexible sigmoidoscopy qualifies for CRC screening but unless it is repeated every 5 years it does not meet the definition of adherence. Moreover, the sources of underutilisation of CRC screening tests are unclear. It has been proved that in individuals with access to health care, a recommendation made by a primary care physician (PCP) is an important facilitator of screening use.^{17,18} With this background, we planned a retrospective study with a primary objective to determine the compliance among primary care physicians with the ACS guidelines for CRC screening. A secondary objective was to identify the reasons for non-compliance as documented in the patient record, and to determine whether differences in compliance exist based on sex and ethnicity.

Methods

This retrospective study was carried out at an internal medicine/primary care practice of eight full-time board-certified internists at the University of Connecticut Health Center at Farmington, CT, USA. This is an academic centre, suburban in location, with the average patient population belonging to the middle to upper socio-economic class. The physicians personally took care of these patients and there was no involvement of medical students or resident physicians.

We randomly selected 221 medical records (110 females and 111 males) for review. This selection of the records was based on the inclusion criteria below:

- 1 all patients born in 1950 or before and
- 2 first visit to the clinic in 2000
- 3 the most recent visit after December 2003, so as to exclude patients who dropped out of the practice or died.

Thus patients selected were age 55 years or older and had been followed up in the clinic for at least 5 years and last seen within the previous 2 years.

The selected records were then examined to answer the following questions.

1 Was screening offered when it was indicated?

We know that screening should begin at age 50 years for average-risk patients and earlier for those at increased risk due to presence of inflammatory bowel disease, family history of polyps or CRC, personal history of polyps, or a family history of hereditary colorectal cancer syndromes. Thus, based on the risk categories as outlined by the ACS, we decided the time for screening for every patient and then reviewed the chart to find at what age screening was discussed or

offered to the patient. We allowed a two-year period to complete screening. Moreover, if the patient turned 50 years before the guidelines were in force, we decided the on-time screening to be 1997 unless previously done.

2 Was screening completed by any of the approved methods either on time or late?

ACS guidelines recommend all of the following: FOBT every year; flexible sigmoidoscopy every 5 years; double contrast barium enema every 5 years; FOBT plus flexible sigmoidoscopy every 5 years; or colonoscopy every 10 years. Moreover, if the PCP chose FOBT only as the preferred screening method it must be three FOBT every year for three consecutive years to constitute complete screening. Only one FOBT in one year was not considered sufficient for screening. We allowed a two-year period for completion of screening. Patients who completed screening late were marked.

3 Were abnormal or normal results followed-up according to the ACS guidelines?

According to the guidelines, flexible sigmoidoscopy should be followed by a full colonoscopy if any polyps are identified during the sigmoid colon evaluation. Additionally, it needs to be repeated every 5 years irrespective of the findings. Guidelines clearly elucidate the follow-up screening strategies based on the initial results or findings. Such a follow-up was considered necessary to qualify for compliance with the

guidelines. We allowed a 2-year period to complete the follow-up.

If the answer to any of the above questions was 'no', or if the screening was completed late, non-compliance was recorded and the medical record was thoroughly searched for the reasons for non-compliance. Moreover, the basic demographic data of each subject pertaining to sex and ethnicity categorised as white and non-white (Hispanic, African-American and Asian) was recorded as well.

Results

The data were analysed using Microsoft Excel. Screening was offered at the time it was indicated in 123/221 patients (55.65%). Screening was completed either late or on-time by one of the methods approved by the ACS in 147/221 patients (66.51%; Figure 1). Abnormal or normal results were followed-up according to the guidelines in 131/221 patients (59.27%). The overall compliance rate was found to be 73/221 (33.01%). Reasons for non-compliance for the most part remain unknown (i.e. there was lack of documentation to explain non-compliance) in 117/148 (79.05%; Figure 2). We found that about 29/148 patients (19.54%) were non-compliant because they declined any sort of screening. Finally, 2/148 patients (1.35%) were non-compliant because of lack of insurance and/or the development of other serious co-morbidities.

Furthermore, 74/111 (66.67%) females completed screening, but the overall compliance rate in the female population was 32/111 (28.82%). Of the non-compliant females, 57/79 (72.15%) were non-compliant

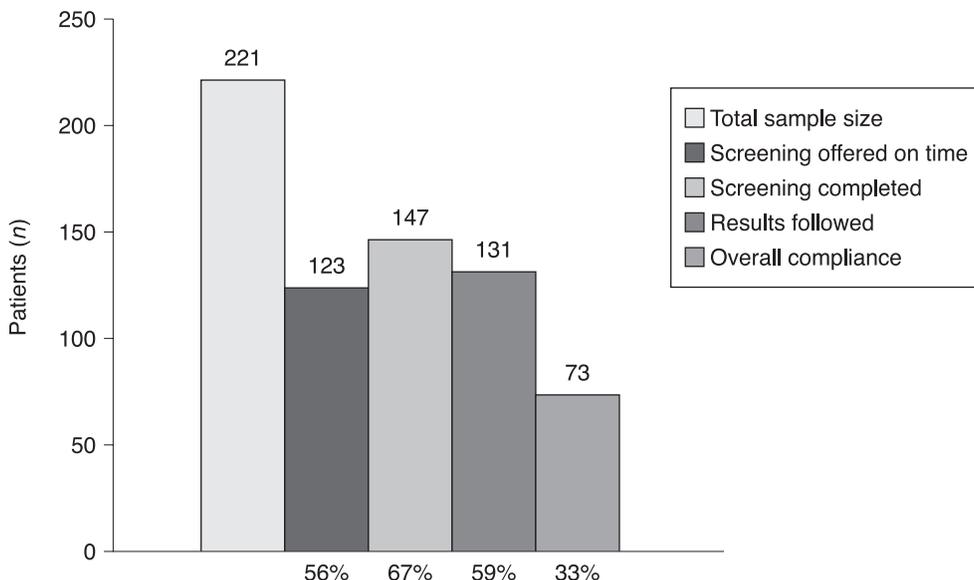


Figure 1 Screening rates and compliance. Numbers are shown at the top of the bars, and percentages in parentheses at the bottom.

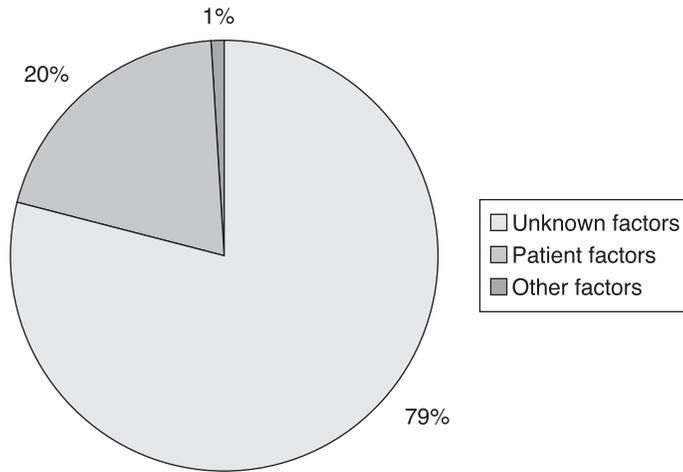


Figure 2 Reasons for non-compliance.

for unknown reasons; 20/79 (25.3%) denied any sort of screening; and 1/79 (1.26%) was non-compliant for other reasons as aforementioned. Among males, 73/110 (66.36%) completed screening although the overall compliance rate in this group was 41/110 (37.27%). Notably, 60/69 (86.95%) were non-adherent for unknown reasons; 9/69 (13.04%) declined any sort of screening; and 1/69 (1.44%) was non-compliant due to other factors. Based on ethnic groups, out of 198 Caucasians, 133 (67.17%) completed screening with an overall compliance rate of 65/198 (32.81%). Also, 104/133 (78.19%) were non-compliant for unknown reasons, whereas 27/133 (20.30%) declined screening. The non-white group on the other hand, showed 14/23 (60.87%) who completed screening and 8/23 (34.78%) were compliant. Of 15 non-compliant patients, 13/15 (86.67%) were for unknown reasons and 2/15 (13.34%) had refused screening.

Discussion

The overall compliance rate for CRC screening in this internal medicine practice was 33%. This demonstrated significant room for improvement. The reasons for non-compliance for the most part were unknown (79%). A significant number of patients refused to be screened (20%). There was a slightly higher rate of compliance among males (37%) than females (28%). This was probably due to higher rate of refusal of screening methods by female patients (18%) when compared to males (8%). The reason for a higher rate of refusing screening among females is uncertain, but may be a reflection of differences in sensitivity or psychological perceptions between the two groups. There did not exist much of a difference in adherence based on the ethnicity, though the division of groups

was unequal. A bigger sample size may help to better explain whether such a difference exists.

The strengths of this study included a reasonably large sample size, a homogenous group practice, clearly defined inclusion criteria, and identical reimbursement for services rendered. The major limitation of our study was generalisability of our findings. This was a limited audit of compliance among university-based general internal medicine specialists engaged in a suburban practice. While we had no a priori basis for assuming that the physicians in this practice were unique in terms of education, practice patterns and orientation towards preventive medicine, we were unaware if they were representative of other groups in these characteristics. Similarly, we had no information that enabled us to determine if the patient population was representative of other suburban populations. Another limitation was the lack of information regarding reasons for poor compliance and for determining if the compliance rate was representative of other primary care practices. Although we could not determine whether our compliance rate was representative, it was clear that there is substantial room for improvement. It is yet to be determined if poor compliance reflects a problem with information, systems, behaviours, or combinations of these. A majority of non-adherent patients were due to 'unknown reasons', suggesting a deficiency in documentation, i.e. literally, no records were kept to determine why the patients were non-adherent.

Our study demonstrated poor compliance with CRC screening guidelines in a primary care practice. The reasons for poor compliance in this particular practice and patient population are unclear, but the implications seem evident: a sizeable proportion of eligible patients are not benefiting from the recommended screening methods. Since primary care physicians serve as gatekeepers for many patients, it may be

beneficial to measure compliance rates in various practices and, if our results are confirmed, design effective intervention strategies.

ETHICS

The study was approved by the institutional review board (IRB) and was conducted in line with nationally accepted ethical guidance.

REFERENCES:

- 1 American Cancer Society. *Colorectal Cancer*. Atlanta: American Cancer Society, 2006. www.cancer.org/downloads/pro/colorectalcancer.pdf (accessed 19 February 2007).
- 2 Dulai GS, Farmer MM, Ganz PA *et al*. Primary care provider perceptions of barriers to and facilitators of colorectal cancer screening in a managed care setting. *Cancer* 2004;100:1843–52.
- 3 Winawer SJ. Colorectal cancer screening comes of age. *New England Journal of Medicine* 1993;328:1416–17.
- 4 Dolan NC, Ferreira MR, Davis TC *et al*. Colorectal cancer screening knowledge, attitudes and beliefs among veterans: does literacy make a difference? *Journal of Clinical Oncology* 2004;22:2617–22.
- 5 Miller BA, Ries LAG, Hankey BF *et al*. *SEER Cancer Statistics Review: 1973–1990* (NIH Publication No. 93–2789). Bethesda, MD: National Cancer Institute, 1993.
- 6 Rawl SM, Menon U, Champion VL *et al*. Do benefits and barriers differ by stage of adoption for colorectal cancer screening? *Health Education Research* 2005;20:137–48.
- 7 Greenlee RT, Murray T, Bolden S *et al*. Cancer statistics 2000. *CA: A Cancer Journal for Clinicians* 2000;50:7–33.
- 8 Mandel JS, Bond JH, Church TR *et al*. Reducing mortality from colorectal cancer by screening for fecal occult blood – Minnesota colon cancer control study. *New England Journal of Medicine* 1993;328:1365–71.
- 9 Winawer SJ, Fletcher R, Rex D *et al*. Colorectal cancer screening and surveillance: clinical guidelines and rationale. *Gastroenterology* 1997;112:544–60.
- 10 Centers for Disease Control and Prevention. Colorectal cancer test use among persons aged 50 years – United States, 2001. *MMWR Morbidity and Mortality Weekly Report* 2003;52:193–6.
- 11 Sirovich BE, Shwartz LM and Woloshin S. Screening men for prostate and colorectal cancer in the United States: does practice reflect the evidence? *Journal of the American Medical Association* 2003;289:1414–20.
- 12 American Cancer Society. *Detailed Guide: colon and rectum cancer. Can colorectal polyps and cancer be found early? Colorectal cancer screening*. www.cancer.org/docroot/CRI/content/CRI_2_4_3X_Can_colon_and_rectum_cancer_be_found_early.asp?sitearea= (accessed 19 February 2007).
- 13 American Cancer Society. *Colorectal Cancer Facts and Figures Special Edition 2005*. Atlanta: American Cancer Society, 2005. www.cancer.org/downloads/STT/CAFF2005CR4PWSecured.pdf (accessed 19 February 2007).
- 14 Seef LC, Shapiro JA and Nadel MR. Are we doing enough to screen for colorectal cancer? Findings from 1999 behavioral risk factor surveillance system. *Journal of Family Practice* 2002;51:761–6.
- 15 Chao A, Connell C, Cokkinides V *et al*. Underuse of screening sigmoidoscopy and colonoscopy in a large cohort of US adults. *American Journal of Public Health* 2004;94:1775–81.
- 16 Seef LC, Nadel MR, Klabunde CN *et al*. Patterns and predictors of colorectal cancer test use in the US adult population. *Cancer* 2004;100:2093–103.
- 17 Mandelson MT, Curry SJ, Anderson LA *et al*. Colorectal cancer screening participation by older women. *American Journal of Preventive Medicine* 2000;19:149–54.
- 18 Shwartz JS, Lewis CE, Clancy C *et al*. Internists' practices in health promotion and disease prevention – a survey. *Annals of Internal Medicine* 1991;114:46–53.

CONFLICTS OF INTEREST

None.

ADDRESS FOR CORRESPONDENCE

Ashish Malhotra MD, 600 Asylum Avenue, Apt. # 621, Hartford, CT-06105, USA. Tel: +1 (860)727–0322; email: ashmalhotra@yahoo.com

Received 21 November 2006

Accepted 30 January 2007