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Women's Health Care Physicians

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Colonoscopy and Colorectal Cancer Screening Strategies

ABSTRACT: Each year colorectal cancer is diagnosed in more women than all types of gynecologic cancer combined. There continues to be a significant need to increase the rate of screening. Obstetrician-gynecologists have a unique opportunity to increase colorectal cancer screening rates among their patients and, thus, favorably affect colorectal cancer morbidity and mortality. Health care providers should counsel patients about the benefits of colorectal cancer screening and recommend colonoscopy every 10 years for either average-risk or high-risk women 50 years and older. The advantages and limitations of other appropriate colorectal cancer screening methods also should be discussed so that women may choose to be tested by whichever method they are most likely to accept and complete.

More than 70,000 women develop colorectal cancer in the United States each year. Colorectal cancer is diagnosed in more women than all types of gynecologic cancer combined. Each year, more than 24,000 women die from colorectal cancer, making it the third leading cause of cancer death in women, after lung cancer and breast cancer (1). Despite consensus among health care organizations about the value of screening for colorectal cancer, a recent study reported that approximately 63% of respondents (U.S. women older than 50 years) have been screened by colonoscopy or sigmoidoscopy in the past 10 years or fecal occult blood test within the past year (2). The primary goal of colorectal cancer screening is to reduce mortality through the reduction of advanced disease. The detection of early-stage adenocarcinomas and the detection and removal of adenomatous polyps can be achieved by colorectal cancer screening (3). The purpose of this document is to review the available methods and recommended screening guidelines to enable the obstetrician-gynecologist to appropriately and adequately counsel patients about colorectal cancer screening.

Prospective randomized trials have demonstrated reductions in mortality associated with early detection of colorectal cancer, as well as with removal of adenomatous polyps. There continues to be a significant need to increase the rate of screening, although the screening rates

in the target population of adults older than 50 years have increased from 20–30% in 1997 to nearly 55% in 2008 (4). It is critical that physicians' practices establish mechanisms to ensure that every eligible patient will receive a screening recommendation. It has been calculated that if 90% of the population were screened as recommended, 310,000 lifetime quality-adjusted life years would be saved (5). However, screening tests are underused for many segments of the population. They also are ordered in a manner inconsistent with guidelines because many physicians continue to recommend that screening begin before 50 years of age or be repeated at too frequent intervals (6).

Screening Guidelines

The American College of Obstetricians and Gynecologists (the College) recommends colonoscopy for colorectal cancer screening for average-risk women beginning at age 50 years. Other organizations recommend colorectal cancer screening, but their recommendations may differ slightly from College guidelines. For example, the U.S. Preventive Services Task Force recommends screening for colorectal cancer using serial fecal occult blood testing, flexible sigmoidoscopy, or colonoscopy in adults at age 50 years and continuing until age 75 years. The U.S. Preventive Services Task Force recommends against screening for colorectal cancer in adults

older than 85 years and recommends against routine screening in adults 75–85 years; however, there may be considerations that support colorectal cancer screening in an individual patient (7). The American College of Gastroenterology recommends that African Americans begin screening at age 45 years with colonoscopy (8). For women at increased risk, screening and surveillance guidelines also have been published (see <http://caonline.amcancersoc.org/cgi/content-nw/full/58/3/130/T3>). Like the joint guideline from the American Cancer Society, the U.S. Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology, the College's recommendations recognize "the complexity of offering multiple screening options and the degree to which the range of screening options and their performance, costs, and demands on individuals poses a significant challenge for shared decisions" (3). The College has developed practical guidance for the generalist obstetrician–gynecologist by recommending colonoscopy as the preferred method of screening because it allows for a full examination of both the colon and rectum in one session, and allows the practitioner to perform a biopsy or polypectomy, if indicated.

Colorectal cancer screening methods should be discussed with patients to identify the method they are most likely to accept and complete. Understanding the advantages and limitations of each screening method is necessary to adequately counsel women. Tests that detect both adenomatous polyps and early colorectal cancer, such as colonoscopy, should be encouraged. However, all methods described in this Committee Opinion are acceptable options to screen for colorectal cancer. Abnormalities found with any other screening method necessitate referral for diagnostic colonoscopy. Every screening method has advantages and limitations, which ultimately depends on the quality of the screening test, patient adherence, and access to timely and appropriate follow-up.

Additionally, increased sensitivity by health care providers to patients' behaviors, feelings, cultural differences, and attitudes can result in increased patient and health care provider satisfaction.

Tests for the Detection of Adenomas and Colorectal Polyps

Colonoscopy

Colonoscopy allows for the mucosal inspection of the entire colon from the dentate line to the appendiceal orifice and is recommended every 10 years beginning at age 50 years. Colonoscopy gives access to right-sided lesions, which comprise a considerable proportion (65%) of advanced colorectal neoplasia in women that would be missed by other screening methods, such as sigmoidoscopy (9). Data indicate that colonoscopy seems to offer lower protection for the proximal colon than for the distal colon (10), although a recent population-based, case–control study suggests that the procedure is associ-

ated with risk reduction in both the right and the left side of the colon (11). In one study, it was shown that the incidence of colorectal cancer was reduced by 76–90% among individuals undergoing colonoscopy with polypectomy compared with individuals in a general population registry (12).

Although colonoscopy remains the standard method for detecting colorectal pathology, the miss rate for adenomas measuring 10 mm or more is 6–12% (13) and for cancer it is approximately 5% (14). Other limitations of colonoscopy include cost, dietary preparation for the procedure, inconvenience of the bowel preparation required of the patient, the necessity of a chaperone for transportation because of sedation, and the risk of serious complications. One study found 2.8 serious complications (including perforations, hemorrhage, diverticulitis, cardiovascular events, severe abdominal pain, and death) per 1,000 procedures (confidence interval, 1.5–5.2 per 1,000 procedures; test for heterogeneity; $P=0.13$) (15).

The effectiveness of the colonoscopy is dependent upon the thoroughness of the bowel preparation and the skill of the endoscopist. The endoscopist should have the ability to sample or remove precancerous lesions (16). Quality indicators for colonoscopy have been established, and include appropriate indication, informed consent, use of recommended postpolypectomy and postcancer resection surveillance intervals, the use of recommended ulcerative colitis and Crohn colitis surveillance, and preparation (17).

Flexible Sigmoidoscopy

Flexible sigmoidoscopy, a test involving the insertion of a thin, flexible tube into the rectum, is associated with a 60–80% reduction in colorectal mortality for the area of the colon within its reach. This protective effect of a reduction in the incidence of distal colorectal cancer persists for up to 16 years (18). The recommended interval between normal flexible sigmoidoscopy with depth of insertion to 40 cm or to the splenic flexure is every 5 years. Two large screening studies indicate that if a patient has an adenoma of any size in the distal colon, she has a twofold or higher risk of proximal advanced neoplasia compared with patients with hyperplastic polyps or no polyps in the distal colon (19, 20). Flexible sigmoidoscopy is technically easier, requires less preparation, can be performed without sedation, and has a lower risk of complications compared with colonoscopy. However, it is limited to examining the most distal portion of the colon and will miss a significant number of right-sided colonic lesions, particularly in women and African Americans (21, 9). Positive findings usually will require referral for colonoscopy. Because of these limitations, the combination of yearly fecal occult blood testing or fecal immunochemical testing (see "Tests for the Detection of Colorectal Cancer") with flexible sigmoidoscopy every 5 years with high-sensitivity fecal occult blood testing every 3 years may be preferable to either method alone (22).

Double Contrast Barium Enema

Double contrast barium enema enables examination of the entire colon and is associated with low risk. Complete bowel preparation is essential for an optimal examination. This test has substantially lower sensitivity than other modern test strategies and is not recommended by the U.S. Preventive Services Task Force. However, this procedure remains an option in cases in which colonoscopy resources are low or colonoscopy is contraindicated or less likely to be successful (eg, prior incomplete colonoscopy or prior pelvic surgery). Any individuals with a polyp measuring 6 mm or more on double contrast barium enema should undergo a follow-up colonoscopy.

Tests for the Detection of Colorectal Cancer

High-sensitivity guaiac fecal occult blood testing and fecal immunochemical testing (FIT) are noninvasive tests that detect occult blood in the stool from large polyps (greater than 1 cm) or cancer disrupting the mucosal barrier (3). Fecal immunochemical testing specifically detects lower-tract bleeding (23). Three large prospective randomized control trials have shown that screened patients have cancer detected at an early and more curable stage than unscreened patients (3). Colorectal cancer screening with fecal occult blood testing or fecal immunochemical testing should be performed on an annual basis. Fecal blood

testing requires three consecutive samples of stool. The optimal number of fecal immunochemical testing samples is unclear, but two samples may be superior to one. Fecal occult blood testing of a single stool sample from a rectal examination performed during an office visit is not adequate for the detection of colorectal cancer and should not be performed. In one study, the sensitivity of a single stool sample for fecal occult blood testing obtained during an office visit by digital rectal examination was 4.9%, compared with 23.9% for the recommended at-home fecal occult blood testing series (24).

Before testing with guaiac fecal occult blood testing, patients should be instructed on the appropriate dietary restrictions (see Table 1) and to avoid the use of all noncardioprotective nonsteroidal drugs. Fecal immunochemical testing detects human globulin, which is a protein that along with heme constitutes human hemoglobin (3) and, therefore, does not require changes in diet or medication before testing.

Although fecal occult blood testing and fecal immunochemical testing are the least invasive colorectal cancer screening methods, they have limitations. For example, both of these methods require samples obtained by the patient at home using a kit that must be returned for analysis. Another limitation of these tests is poor-quality screening practices, which may be affecting mortality rates (25). These tests often are distributed sporadically

Table 1. Guidelines for Screening for the Early Detection of Colorectal Cancer and Adenomas for Average-Risk Women and Men Aged 50 Years and Older*

Tests That Detect Adenomatous Polyps and Cancer		
Test	Interval	Key Issues for Informed Decisions
Colonoscopy	Every 10 years	<ul style="list-style-type: none">• Complete bowel preparation is required• Conscious sedation is used in most centers; patients will miss a day of work and will need a chaperone for transportation from the facility• Risks include perforation, bleeding, and death, which are rare but potentially serious; most of the risk is associated with polypectomy
Flexible sigmoidoscopy with insertion to 40 cm or to splenic flexure	Every 5 years	<ul style="list-style-type: none">• Complete or partial bowel preparation is required• Sedation usually is not used, so there may be some discomfort during the procedure• The protective effect of sigmoidoscopy is primarily limited to the portion of the colon examined• Patients should understand that positive findings on sigmoidoscopy usually result in a referral for colonoscopy
Double contrast barium enema	Every 5 years	<ul style="list-style-type: none">• Complete bowel preparation is required• If patients have one or more polyps larger than 6 mm, colonoscopy will be recommended; follow-up colonoscopy will require complete bowel preparation• Risks of DCBE are very low; rare cases of perforation have been reported• Use is dependent upon the availability of facilities with the expertise to perform and interpret the study

(continued)

Table 1. Guidelines for Screening for the Early Detection of Colorectal Cancer and Adenomas for Average-Risk Women and Men Aged 50 Years and Older* (*continued*)

Tests That Detect Adenomatous Polyps and Cancer		
Test	Interval	Key Issues for Informed Decisions
Computed tomography colonography	Every 5 years	<ul style="list-style-type: none"> • Complete bowel preparation is required • If patients have one or more polyps larger than 6 mm, colonoscopy will be recommended; if same day colonoscopy is not available, a second complete bowel preparation will be required before colonoscopy • Risks of CTC are very low; rare cases of perforation have been reported • Significance of incidental extracolonic findings not clear • Increased lifetime, cumulative radiation risk needs further evaluation
Tests That Primarily Detect Cancer		
Test	Interval	Key Issues for Informed Decisions
gFOBT with high sensitivity for cancer	Annual	<ul style="list-style-type: none"> • Depending on manufacturer’s recommendations, two to three stool samples collected at home are needed to complete testing; a single sample of stool gathered during a digital exam in the clinical setting is not an acceptable stool test and should not be done
FIT with high sensitivity for cancer	Annual	<ul style="list-style-type: none"> • Positive test results are associated with an increased risk of colon cancer and advanced neoplasia; colonoscopy should be recommended if the test results are positive • If the test result is negative, the test should be repeated annually • Patients should understand that one-time testing is likely to be ineffective
sDNA with high sensitivity for cancer	Interval uncertain	<ul style="list-style-type: none"> • An adequate stool sample must be obtained and packaged with appropriate preservative agents for shipping to the laboratory • The unit cost of the currently available test is significantly higher than other forms of stool testing • If the test result is positive, colonoscopy will be recommended • If the test result is negative, the appropriate interval for a repeat test is uncertain

Abbreviations: CTC, computed tomography colonography; DCBE, double-contrast barium enema; FIT, fecal immunochemical test; gFOBT, guaiac-based fecal occult blood test; sDNA, stool DNA test.

*These options are acceptable choices for colorectal cancer screening in average-risk adults beginning at age 50 years. Because each of these tests has inherent characteristics related to prevention potential, accuracy, costs, and potential harms, individuals should have an opportunity to make an informed decision when choosing one of these options.

In the opinion of the Guidelines Development Committee (of the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology), colon cancer prevention should be the primary goal of colorectal cancer screening. Tests that are designed to detect both early cancer and adenomatous polyps should be encouraged if resources are available and patients are willing to undergo an invasive test.

Modified from Levin B, Lieberman DA, McFarland B, Andrews KS, Brooks D, Bond J, et al. Screening and surveillance for the early detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *CA Cancer J Clin.* 2008 May-Jun;58(3):130-60. This material is reproduced with permission of John Wiley & Sons, Inc.

and always in the context of a visit because a system or program of screening is not being used. Health care providers should understand that guaiac fecal occult blood testing and fecal immunochemical testing are less likely to detect cancer compared with the invasive tests, guaiac fecal occult blood testing and fecal immunochemical testing must be repeated at regular intervals to be effective, and positive test results with guaiac fecal occult blood testing or fecal immunochemical testing require a diagnostic workup with colonoscopy to examine the entire colon.

Developing Technologies

Virtual Colonoscopy

A noninvasive method of colorectal cancer screening currently being evaluated is computed tomography colonography or virtual colonoscopy (see Table 1). Virtual colonoscopy requires bowel preparation similar to colonoscopy. In randomized trials, virtual colonoscopy has shown 39% sensitivity and 90.5% specificity in detecting lesions of at least 6 mm. (26). The potential harm from evaluation of incidental extracolonic findings and

the lifetime cumulative radiation risk must be evaluated. Because computed tomography colonography is an imaging examination, screening programs should consider offering same-day colonoscopy to eliminate a second bowel preparation for the patient. Radiologists experienced in the evaluation of this modality may not be widely available. This test is not currently recommended by the U.S. Preventive Services Task Force.

Fecal DNA Testing

Fecal DNA testing detects genetic mutations associated with colorectal cancer. Adenoma and carcinoma cells that contain neoplastic changes are shed into the lumen of the large bowel and eliminated with feces. Because there is no single gene mutation present in the cells of every adenoma or adenocarcinoma, a multitargeted DNA assay is necessary. Because DNA is stable in stool, it can be isolated from bacterial DNA found in feces. Fecal DNA testing requires only a single stool sample. There is no direct risk to the colon, no bowel preparation is necessary, there are no pretest dietary modifications, and the sampling is performed at home. In a recent prospective randomized trial, the fecal DNA test was found to be more sensitive than fecal occult blood testing in detecting both precancerous and cancerous colonic lesions in individuals at average risk of developing colorectal cancer (27). Fecal DNA tests are evolving, and no test is widely used; however, these tests have the potential to be highly specific tests. This test is not currently recommended by the U.S. Preventive Services Task Force.

Conclusions and Recommendations

- Colorectal screening methods should be discussed with patients to identify the method they are most likely to accept and complete.
- Tests that detect both early colorectal cancer and adenomatous polyps should be encouraged.
- Abnormalities found with any other screening methods necessitate referral for diagnostic colonoscopy.
- In-office single stool guaiac fecal occult blood testing or digital rectal examination for colorectal cancer screening should not be performed.
- Every screening method has advantages and limitations, which ultimately depends on the quality of the screening test, patient adherence, and access to timely and appropriate follow-up.

References

1. Jemal A, Siegel R, Xu J, Ward E. Cancer statistics, 2010. *CA Cancer J Clin* 2010;60:277–300.
2. Vital signs: colorectal cancer screening among adults aged 50–75 years—United States, 2008. Centers for Disease Control and Prevention (CDC). *MMWR Morb Mortal Wkly Rep* 2010;59:808–12.
3. Levin B, Lieberman DA, McFarland B, Andrews KS, Brooks D, Bond J, et al. Screening and surveillance for the early

detection of colorectal cancer and adenomatous polyps, 2008: a joint guideline from the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *American Cancer Society Colorectal Cancer Advisory Group; US Multi-Society Task Force; American College of Radiology Colon Cancer Committee. Gastroenterology* 2008;134:1570–95.

4. Steinwachs D, Allen JD, Barlow WE, Duncan RP, Egede LE, Friedman LS, et al. National Institutes of Health state-of-the-science conference statement: Enhancing use and quality of colorectal cancer screening. *Ann Intern Med* 2010;152:663–7.
5. Maciosek MV, Coffield AB, Edwards NM, Flottemesch TJ, Goodman MJ, Solberg LI. Priorities among effective clinical preventive services: results of a systematic review and analysis. *Am J Prev Med* 2006;31:52–61.
6. Klabunde CN, Lanier D, Nadel MR, McLeod C, Yuan G, Vernon SW. Colorectal cancer screening by primary care physicians: recommendations and practices, 2006–2007. *Am J Prev Med* 2009;37:8–16.
7. Screening for colorectal cancer: U.S. Preventive Services Task Force recommendation statement. U.S. Preventive Services Task Force. *Ann Intern Med* 2008;149:627–37.
8. Agrawal S, Bhupinderjit A, Bhutani MS, Boardman L, Nguyen C, Romero Y, et al. Colorectal cancer in African Americans. Committee of Minority Affairs and Cultural Diversity, American College of Gastroenterology [published erratum appears in *Am J Gastroenterol* 2005;100:1432]. *Am J Gastroenterol* 2005;100:515–23; discussion 514.
9. Schoenfeld P, Cash B, Flood A, Dobhan R, Eastone J, Coyle W, et al. Colonoscopic screening of average-risk women for colorectal neoplasia. CONCeRN Study Investigators. *N Engl J Med* 2005;352:2061–8.
10. Baxter NN, Rabeneck L. Is the effectiveness of colonoscopy “good enough” for population-based screening? *J Natl Cancer Inst* 2010;102:70–1.
11. Brenner H, Chang-Claude J, Seiler CM, Rickert A, Hoffmeister M. Protection from colorectal cancer after colonoscopy: a population-based, case–control study. *Ann Intern Med* 2011;154:22–30.
12. 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.
13. Pickhardt PJ, Nugent PA, Mysliwiec PA, Choi JR, Schindler WR. Location of adenomas missed by optical colonoscopy. *Ann Intern Med* 2004;141:352–9.
14. Bressler B, Paszat LF, Vinden C, Li C, He J, Rabeneck L. Colonoscopic miss rates for right-sided colon cancer: a population-based analysis. *Gastroenterology* 2004;127:452–6.
15. Whitlock EP, Lin JS, Liles E, Beil TL, Fu R. Screening for colorectal cancer: a targeted, updated systematic review for the U.S. Preventive Services Task Force. *Ann Intern Med* 2008;149:638–58.
16. Lieberman D, Nadel M, Smith RA, Atkin W, Duggirala SB, Fletcher R, et al. Standardized colonoscopy reporting and data system: report of the Quality Assurance Task Group of the National Colorectal Cancer Roundtable. *Gastrointest Endosc* 2007;65:757–66.

17. Rex DK, Petrini JL, Baron TH, Chak A, Cohen J, Deal SE, et al. Quality indicators for colonoscopy. *Gastrointest Endosc* 2006;63(4 suppl):S16–28.
18. Newcomb PA, Storer BE, Morimoto LM, Templeton A, Potter JD. Long-term efficacy of sigmoidoscopy in the reduction of colorectal cancer incidence. *J Natl Cancer Inst* 2003;95:622–5.
19. 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.
20. Lieberman DA, Weiss DG. One-time screening for colorectal cancer with combined fecal occult-blood testing and examination of the distal colon. Veterans Affairs Cooperative Study Group 380. *N Engl J Med* 2001;345:555–60.
21. Nelson RL, Dollear T, Freels S, Persky V. The relation of age, race, and gender to the subsite location of colorectal carcinoma. *Cancer* 1997;80:193–7.
22. Smith RA, Cokkinides V, Eyre HJ. American Cancer Society guidelines for the early detection of cancer, 2006. *CA Cancer J Clin* 2006;56:11–25; quiz 49–50.
23. Allison JE. Colon Cancer Screening Guidelines 2005: the fecal occult blood test option has become a better FIT. *Gastroenterology* 2005;129:745–8.
24. Collins JF, Lieberman DA, Durbin TE, Weiss DG. Accuracy of screening for fecal occult blood on a single stool sample obtained by digital rectal examination: a comparison with recommended sampling practice. Veterans Affairs Cooperative Study #380 Group. *Ann Intern Med* 2005;142:81–5.
25. Nadel MR, Shapiro JA, Klabunde CN, Seeff LC, Uhler R, Smith RA, et al. A national survey of primary care physicians' methods for screening for fecal occult blood. *Ann Intern Med* 2005;142:86–94.
26. Cotton PB, Durkalski VL, Pineau BC, Palesch YY, Mauldin PD, Hoffman B, et al. Computed tomographic colonography (virtual colonoscopy): a multicenter comparison with standard colonoscopy for detection of colorectal neoplasia. *JAMA* 2004;291:1713–9.
27. Imperiale TF, Ransohoff DF, Itzkowitz SH, Turnbull BA, Ross ME. Fecal DNA versus fecal occult blood for colorectal-cancer screening in an average-risk population. Colorectal Cancer Study Group. *N Engl J Med* 2004;351:2704–14.

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