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Cancer Screening in the United States, 2008: A Review of Current American Cancer Society Guidelines and Cancer Screening Issues

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ABSTRACT Each year the American Cancer Society (ACS) publishes a summary of its recommendations for early cancer detection and a summary of the most current data on cancer screening rates and trends in US adults. In 2007, the ACS updated its colorectal cancer screening guidelines in a collaborative effort with the US Multi-Society Task Force and the American College of Radiology. In this issue of the journal, we summarize the current ACS guidelines, provide an update of the most recent data pertaining to participation rates in cancer screening from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System and the National Health Interview Survey, and address some issues related to access to care. (CA Cancer J Clin 2008;58:161-179.) © American Cancer Society, Inc., 2008.

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INTRODUCTION

Eight years ago, the American Cancer Society (ACS) inaugurated a yearly report on its cancer screening guidelines in *CA: A Cancer Journal for Clinicians*. The first report included a description of the ACS process for the development or update of a cancer screening guideline, and that report and subsequent reports have provided a summary of the current ACS cancer screening guidelines, as well as guidance to the public about testing for early detection for some cancers where mass screening is not recommended and the most recent data on adult cancer screening rates and trends.¹ The scientific literature is monitored on an ongoing basis, and guidelines are reviewed and updated at least every 5 years. However, over the past decade, some guidelines have been updated more frequently as new evidence or the emergence of new technologies warrant an update in guidance to health professionals and the public. The annual guideline review, as well as the more detailed guideline updates published as stand-alone articles, are available online at <http://CAonline.AmCancerSoc.org>. Table 1 shows the recent history of guidelines updates, as well as those in progress.

SCREENING FOR BREAST CANCER

Breast cancer is the most common cancer diagnosed in US women and the second leading cause of death from cancer in US women.¹¹ ACS guidelines for breast cancer screening in average-risk women were last updated in 2003,² and screening guidelines for women at high risk due to known or suspected inherited susceptibility to breast cancer or who had undergone mantle radiation to the chest at an early age for Hodgkin lymphoma were updated in 2007 (Table 2).³ Guidelines for the early detection of breast cancer in average-risk women consist of a combination of clinical breast examination (CBE) and counseling to raise awareness of breast symptoms beginning at age 20 years, and regular mammography beginning at age 40 years (Table 2).

Between the ages of 20 to 39 years, women should undergo CBE every 3 years and annually after age 40 years. This exam should take place during periodic health examinations. When CBE is performed, there is an opportunity for

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TABLE 1 History of Recent Updates to American Cancer Society Cancer Early Detection Guidelines

Cancer Site	Year
Breast cancer	2003, Complete update ²
	2007, Guidelines for magnetic resonance imaging use in high-risk women ³
Cervical cancer	2002, Complete update ⁴
	2007, Guidelines for human papillomavirus-vaccine use ⁵
Colorectal cancer	2001, Complete update ⁶
	2003, Technology update ⁷
	2006, Update for postpolypectomy and postcolorectal cancer resection surveillance ⁸⁻⁹
	2008, Complete update ¹⁰
Endometrial cancer	2001, Guidance for counseling, shared decision making, and high-risk women ⁶
Lung cancer	2001, Guidance for shared decision making ⁶
Prostate cancer	2001, Guidance for shared decision making related to testing for early detection and screening recommendations for higher-risk men ⁶
	2009, Update anticipated
	2008, Update anticipated

health care professionals to review and update the woman's family history; discuss the importance of early breast cancer detection; and answer any questions women may have about their own risk, new technologies, or other matters related to breast disease. During these discussions, health care professionals should emphasize the importance of awareness and recognition of breast changes and, if changes are perceived, the importance of contacting their physician promptly. Although the ACS no longer recommends monthly breast self-examination (BSE), women should be informed about the potential benefits, limitations, and harms (principally the possibility of a false-positive result) associated with BSE. Women may then choose to do BSE regularly, occasionally, or not at all. If a woman chooses to perform periodic BSE, she should receive instruction in the technique and periodically have her technique reviewed.

The ACS recommends that average-risk women should begin annual mammography at the age of 40 years. Women also should be informed about the scientific evidence demonstrating the value of detecting breast cancer before symptoms develop¹² and the importance of adhering to a schedule of

regular mammograms. The benefits of mammography include a reduction in the risk of dying from breast cancer and, if breast cancer is detected early, less aggressive therapy and a greater range of treatment options. Women also should be told about the limitations of mammography, specifically that mammography will not detect all breast cancers and that some breast cancers detected with mammography may still have poor prognoses. Further, women should be informed about the potential harms associated with mammographic screening, including false positives and the possibility of undergoing a biopsy for abnormalities that prove to be benign.

There is no specific upper age at which mammography screening should be discontinued. Rather, the decision to stop regular mammography screening should be individualized based on the potential benefits and risks of screening in the context of overall health status and estimated longevity.¹³ As long as a woman is in good health and would be a candidate for breast cancer treatment, she should continue to be screened with mammography.

In the 2003 guidelines update, the ACS concluded that there was insufficient evidence to recommend a specific surveillance strategy for high-risk women, including women younger than age 40 years who were known or suspected *BRCA1* or *BRCA2* mutation carriers. However, at that time the ACS noted that there was sufficient evidence to conclude that women at significantly increased risk for breast cancer due to known or possible mutation carrier status might benefit from earlier initiation of screening, screening at shorter intervals, and adding additional modalities such as ultrasound or magnetic resonance imaging (MRI) to mammography and CBE.² Based on the accumulation of additional evidence since the last update, in 2007 the ACS issued specific guidelines for breast cancer screening in high-risk women.³ Screening MRI is recommended for women with a known *BRCA* mutation, women who are untested but have a first-degree relative with a *BRCA* mutation, or women with an approximately 20% to 25% or greater lifetime risk of breast cancer based on breast cancer risk-estimation models capable of pedigree analysis of first- and second-degree relatives on both the maternal and paternal sides. On the basis of expert opinion, MRI also is recommended for women who were

TABLE 2 American Cancer Society Recommendations for the Early Detection of Cancer in Average-risk Asymptomatic People

Cancer Site	Population	Test or Procedure	Frequency
Breast	Women, aged 20 years and older	BSE	BSE is an option. Beginning in their early 20s, women should be told about the benefits and limitations of BSE. The importance of prompt reporting of any new breast symptoms to a health professional should be emphasized. Women who choose to do BSE should receive instruction and have their technique reviewed on the occasion of a periodic health examination. It is acceptable for women to choose not to do BSE or to do BSE irregularly.
		CBE	For women in their 20s and 30s, it is recommended that CBE be part of a periodic health examination, preferably at least every 3 years. Asymptomatic women aged 40 years and older should continue to receive a CBE as part of a periodic health examination, preferably annually.
		Mammography	Begin annual mammography at age 40 years.*
Colorectal	Men and women, aged 50 years and older	gFOBT† or FIT with high sensitivity for cancer	Annual, starting at age 50 years.
		Stool DNA test	Interval uncertain, starting at age 50 years.
		Flexible sigmoidoscopy, or	Every 5 years, starting at age 50 years.
		Colonoscopy, or	Every 10 years, starting at age 50 years.
		DCBE, or CT colonography	Every 5 years, starting at age 50 years.
Prostate	Men, aged 50 years and older	DRE and PSA	The PSA test and the DRE should be offered annually, starting at age 50 years, for men who have a life expectancy of at least 10 years.‡
Cervix	Women, aged 18 years and older	Pap test	Cervical cancer screening should begin approximately 3 years after a woman begins having vaginal intercourse but no later than age 21 years. Screening should be done every year with conventional Pap tests or every 2 years using liquid-based Pap tests. At or after age 30 years, women who have had 3 normal test results in a row may get screened every 2 to 3 years with cervical cytology (either conventional or liquid-based Pap test) alone or every 3 years with an HPV DNA test plus cervical cytology. Women aged 70 years and older who have had 3 or more normal Pap tests and no abnormal Pap tests in the last 10 years and women who have had a total hysterectomy may choose to stop cervical cancer screening.
Endometrial	Women, at menopause	At the time of menopause, women at average risk should be informed about risks and symptoms of endometrial cancer and strongly encouraged to report any unexpected bleeding or spotting to their physicians.	
Cancer-related checkup	Men and women, aged 20 years and older	On the occasion of a periodic health examination, the cancer-related checkup should include examination for cancers of the thyroid, testicles, ovaries, lymph nodes, oral cavity, and skin, as well as health counseling about tobacco, sun exposure, diet and nutrition, risk factors, sexual practices, and environmental and occupational exposures.	

*Beginning at age 40 years, annual CBE should be performed prior to mammography.

†gFOBT as it is sometimes done in physicians' offices, with the single stool sample collected on a fingertip during a DRE, is not an adequate substitute for the recommended at-home procedure of collecting 2 samples from 3 consecutive specimens. Toilet bowl FOBT tests also are not recommended. There is no justification for repeating FOBT in response to an initial positive finding.

‡Information should be provided to men about the benefits and limitations of testing so that an informed decision about testing can be made with the clinician's assistance.

Abbreviations: BSE, breast self-examination; CBE, clinical breast examination; gFOBT, guaiac-based fecal occult blood test; FIT, fecal immunochemical test; DCBE, double-contrast barium enema; DRE, digital rectal examination; PSA, prostate-specific antigen test; HPV, human papillomavirus.

treated with radiation to the chest between ages 10 and 30 years and for women who are mutation carriers themselves or first-degree relatives of other high-risk genetic syndromes, such as Li

Fraumeni syndrome, Cowden syndrome, or Bannayan-Riley-Ruvalcaba syndrome. The expert panel concluded that there was insufficient evidence to recommend for or against

MRI screening in women with a 15% to 20% lifetime risk as defined by these same family history-based risk-estimation models or women with a history of ductal or lobular carcinoma in situ, a history of biopsy-proven proliferative lesions, or extremely dense breasts. MRI is not recommended for women at average risk.³

Although there is a large literature on breast cancer risk, most of this information has been relevant to epidemiological studies, and until recently there has been little, if any, practical application to screening recommendations or protocols. For many years, a significant family history, distinguished by multiple first-degree relatives with breast and/or ovarian cancer and, in particular, premenopausal diagnoses in the affected relatives, has been a marker of higher risk and increased risk due to the possibility of a *BRCA* mutation. Women with this family history pattern were commonly counseled to begin screening earlier, and a rule of thumb was to begin screening 10 years earlier than the youngest affected first-degree relative. The new ACS guidelines represent an evidence-based step forward in refining and formalizing the range of expert opinions and practices that have been in place for years to meet the special needs of women at known or likely inherited susceptibility for breast cancer.

However, current evidence suggests that it is uncertain what proportion of women with significant family histories will be identified as candidates for earlier and more intensive screening for breast cancer.¹⁴ In a recent study, Ramsey and colleagues evaluated data from the 2000 National Health Interview Survey (NHIS) to estimate the prevalence of a family history for common cancers.¹⁵ Breast cancer was the most commonly reported cancer in family members and was prevalent in approximately 8% of families. Prevalence ranged from 2.78% in respondents aged 20 to 29 years to 14.43% in women aged 70 to 79 years. Before the age of 40 years, the age at which many average-risk women begin mammography screening and are likely to be asked about family history before breast imaging, a woman's primary caregivers are the only likely resource for regular assessment of family history. Regular assessment of cancer family history is necessary to identify new patterns of family history that may affect a woman's risk status.

Yet, recent studies continue to reveal that a significant percentage of adults do not have their family history taken or taken regularly, that when family history is taken it is often incomplete, and that the possibility of elevated risk based on family history is often overlooked.¹⁶ For example, in a recent comparison of family history information gathered in interviews and then compared with medical charts, fewer than half of women with a family history of breast cancer had their risk documented in the medical record.¹⁷ In another report, Sabatino and colleagues surveyed primary care providers to assess knowledge and practices related to cancer-risk assessment. While the majority of primary care providers stressed the importance of taking a family history related to breast cancer, the majority did not compute Gail scores, and only approximately half applied risk information to screening recommendations.¹⁸ At this time, the data indicate that most primary care providers are not taking a regular, thorough, cancer family history and that lack of knowledge and lack of time/resources are the largest barriers to meeting this need.¹⁸ Based on these observations, it is unlikely that the average primary care provider currently is able to fully identify the patients in their panel who may be at significantly elevated risk, and it is especially unlikely that they are prepared to conduct more comprehensive risk assessment with specialized family history software³ if a woman's family history suggests the possibility of being a mutation carrier. As guidelines evolve to tailor screening recommendations based on specific risk factors, the inability to properly monitor and act on family history information warrants renewed and more intensive efforts to raise awareness among providers and the public regarding the importance of a current family history to guide preventive care. The regular assessment of a woman's family history of breast and/or ovarian cancer on the maternal and paternal side is critical to identifying women who may be candidates to begin breast cancer screening at an early age with multimodal imaging, but also to prevent inappropriate referral to MRI.¹⁴ A clear, shared, and perhaps even redundant division of labor between individuals and health care professionals related to the importance of family history is a necessary prerequisite to

fulfilling the potential that risk-based cancer screening guidelines offer to those for whom they are most needed.

SCREENING FOR CERVICAL CANCER

ACS guidelines for cervical cancer screening were last updated in 2002 (Table 2)⁴ and reflect the current understanding of the underlying epidemiology of cervical intraepithelial neoplasia (CIN), in particular the causal role of human papillomavirus (HPV) in the etiology of cervical cancer.¹⁹ The guidelines recommend different surveillance strategies and options based on a woman's age, her screening history, other risk factors, and the screening and diagnostic technologies she chooses.

The ACS recommends that screening for cervical cancer should begin approximately 3 years after first vaginal intercourse but no later than age 21 years. Until age 30 years, women should receive either annual screening with conventional cervical cytology smears or biennial screening using liquid-based cytology. After age 30 years, a woman who has had 3 consecutive technically satisfactory Pap tests with normal/negative results may undergo screening every 2 to 3 years using either conventional or liquid-based cytology; alternatively, she may undergo screening every 3 years with the combination of HPV DNA testing and conventional or liquid-based cytology. Women who choose to undergo HPV DNA testing should be informed that (1) HPV infection usually is not symptomatic, long-lasting, or harmful; (2) almost everyone who has had sexual intercourse has been exposed to HPV and that infection is very common; (3) a positive HPV test result does not reflect the presence of a sexually transmitted disease, but rather a sexually acquired infection; and (4) a positive HPV test result does not indicate the presence of cancer, nor will the large majority of women who test positive for an HPV infection develop advanced cervical neoplasia.

Women who have an intact cervix and who are in good health should continue screening until age 70 years, and afterward may elect to stop screening if (1) they have had no abnormal/positive cytology tests within the 10-year period before age 70 years and (2) if there is documentation that

the 3 most recent Pap tests were technically satisfactory and interpreted as normal. However, screening after age 70 years is recommended for women in good health who have not been previously screened, women for whom information about previous screening is unavailable, and women for whom there is a low likelihood of past screening.

Guidelines for cervical cancer screening for women with special circumstances differ from the recommendations for average-risk women. Women with a history of cervical cancer or in utero exposure to diethylstilbestrol (DES) should follow the same guidelines as average-risk women before age 30 years and should continue with that protocol after age 30 years. Women who are immunocompromised by organ transplantation, chemotherapy, or chronic corticosteroid treatment, or who are HIV+, should be tested twice during the first year after diagnosis and annually thereafter, according to guidelines from the US Public Health Service and Infectious Disease Society of America.²⁰ There is no specific age to stop screening for women with a history of cervical cancer, in utero exposure to DES, and women who are immunocompromised (including HIV+). Women in these risk groups should continue cervical cancer screening for as long as they are in reasonably good health and would benefit from early detection and treatment.

Cervical cancer screening is not indicated for women who have had a total hysterectomy or who have undergone removal of the cervix for benign gynecologic disease. However, a woman with a history of CIN2/3 or a woman for whom it is not possible to document the absence of CIN2/3 before or as the indication for the hysterectomy should continue to be screened until she has a 10-year history of no abnormal/positive cytology tests, including documentation that the 3 most recent consecutive tests were technically satisfactory and interpreted as normal/negative. Women who have had a hysterectomy who also have a history of in utero DES exposure and/or a history of cervical carcinoma should continue screening after hysterectomy for as long as they are in reasonably good health and would benefit from early detection and treatment. Average-risk women who have had a subtotal (supracervical) hysterectomy should be screened

following the recommendations for average-risk women who have not undergone hysterectomy.

In 2005, the ACS initiated a guideline-development process for the use of the prophylactic HPV vaccine for the prevention of CIN and cervical cancer. Recommendations addressing the use of prophylactic HPV vaccines, including policy and implementation issues, were published in January 2007.⁵ The ACS recommends routine HPV vaccination principally for females aged 11 to 12 years, but also for females aged 13 to 18 years to “catch up” those who missed the opportunity to be vaccinated or who need to complete the vaccination series. The guidelines state that there is insufficient data to recommend for or against universal vaccination of females aged 19 to 26 years. Women in this age group who are interested in undergoing vaccination should talk with a health care professional about their risk of previous HPV exposure and the potential benefit of vaccination. Screening for CIN and cancer should continue in both vaccinated and unvaccinated women according to current ACS early detection guidelines for cervical cancer.

SCREENING AND SURVEILLANCE FOR THE EARLY DETECTION OF ADENOMATOUS POLYPS AND COLORECTAL CANCER

Guidelines for screening and surveillance for the early detection of adenomatous polyps and colorectal cancer (CRC) in average-risk adults have been updated in a consensus process that included the ACS, the US Multi-Society Task Force on Colorectal Cancer (USMSTF) (which comprises representatives of the American College of Gastroenterology, American Gastroenterological Association, and American Society for Gastrointestinal Endoscopy), and the American College of Radiology. The new guidelines are reported in *CA* (Table 2).¹⁰ Previously, the ACS guidelines were last completely updated in 2001, and in 2003, a technology update was conducted, and ACS recommendations for stool blood testing were modified to include fecal immunochemical tests (FIT) (Table 1).^{6,7} The most recent update of the USMSTF CRC screening guidelines was published in 2003,²¹ and the most recent update of the US Preventive Services Task Force guidelines was published in 2002.²² In 2006, the ACS

and the USMSTF issued a joint guideline update for postpolypectomy and postcolorectal cancer resection surveillance.^{8,9} The guidelines for postpolypectomy and postcolorectal cancer resection surveillance were revised based on evidence showing that surveillance colonoscopy intervals were highly variable across different professional specialties and often shorter than current recommendations.²³ Follow-up strategies that are too frequent not only raise costs, but also expose patients to excess risk of harms.²⁴

The decision to pursue a consensus guideline grew out of discussions among representatives of the participating organizations that also are members of the National Colorectal Cancer Roundtable Quality Assurance Committee. Apart from the general agreement that consensus guidelines can enhance the strength of organizational recommendations and minimize confusion among health professionals and the public that occurs when guidelines are issued separately, there also was agreement on the need to address a number of practical issues and concerns about the complexity of options for CRC screening.²⁵

The new guideline continues to endorse the full range of technologies that have been recommended in earlier versions of the ACS and USMSTF guidelines, including both guaiac-based fecal occult blood tests (gFOBT) and FIT, flexible sigmoidoscopy (FSIG), colonoscopy, and double-contrast barium enema (DCBE), but 2 new technologies—stool DNA testing (sDNA) and computed tomographic colonography (CTC, or virtual colonoscopy)—are now endorsed as options for CRC screening. The updated guidelines also differ from previous guidelines in several important ways, which are summarized here. First, to support referring physicians and to improve informed decisions, CRC screening tests are grouped into 2 categories, ie, (1) tests that *primarily* detect cancer (gFOBT, FIT, sDNA) and (2) tests that can detect cancer and advanced lesions (endoscopic and radiographic exams). Second, the guidelines state that while all screening options are acceptable, prevention of CRC is the priority in screening. While there have been calls to state a preference for colonoscopy above all other options,²⁶ studies have shown that even after a process of shared decision making, adults show considerable variation in the tests they choose.²⁷ Because there

are now several options for full exams of the colon, and for all the other reasons outlined in the document that support choice among options, the organizations agreed to still not state a preference for any single test. However, it seems that a growing proportion of the public and referring physicians support the goal of prevention since colonoscopy appears to be the one test among all others for which utilization is increasing.²⁸ Third, because there are few programs or systems in place to ensure regular, repeat screening, the new guidelines state that a screening test must be able to detect the majority of prevalent or incident cancers at the time of testing. In the past, program sensitivity rather than test sensitivity was an important factor in the acceptance and cost-effectiveness of some CRC screening tests, and this was particularly true for annual stool blood testing with low-sensitivity unrehydrated gFOBT. While some gFOBT have relatively low sensitivity for cancer on the occasion of a single test (test sensitivity), when the test is done annually in a program of regular testing, the sensitivity improves due to consecutive opportunities for the test to eventually be positive in a person with cancer (program sensitivity). However, in the United States, regular testing is uncommon, and there is little near-term likelihood that this situation will improve. At this time, millions of Americans are sporadically tested with low-sensitivity unrehydrated gFOBT, and test performance is especially unacceptable when it is performed in the office with single-sample FOBT.^{29,30} As in previous versions of the guidelines, in-office testing with FOBT is strongly discouraged, and FOBT tests that do not detect a majority of occult CRC at the time of testing are not recommended. Finally, new data on the effectiveness of sDNA and CTC provide sufficient evidence to include these tests among the options for CRC screening. On September 27, 2007, early results from the American College of Radiology Imaging Network trial of CTC versus optical colonoscopy were presented.³¹ A manuscript reporting the results presently is in review at a leading medical journal.

The updated CRC screening guidelines include the following options, which are divided into 2 groups of tests based on the underlying potential for either early CRC detection versus early CRC detection and CRC prevention. An option

may be chosen based on individual risk, personal preference, and access. Average-risk adults should begin CRC screening at age 50 years with *one* of the following options: (1) annual gFOBT or FIT, following manufacturers' recommendations for specimen collection; (2) sDNA, for which at this time there is uncertainty in the screening interval; (3) FSIG every 5 years; (4) colonoscopy every 10 years; (5) DCBE every 5 years; or (6) CTC every 5 years. Single-panel FOBT in the medical office using a stool sample collected during a digital rectal exam (DRE) is not a recommended option due to its very low sensitivity for advanced adenomas and cancer.²⁹ An additional option for regular screening is annual stool blood testing (gFOBT or FIT) with FSIG every 5 years. Health professionals should provide guidance to adults about the benefits, limitations, and potential harms associated with screening for CRC, including information on test characteristics and requirements for successful testing. For example, when advising patients about gFOBT or FIT, it is important to stress that unless there is a commitment to annual at-home testing with adherence to manufacturers' instructions, the lower sensitivity observed with one-time testing would make stool testing a poor choice.

The ACS and other organizations recommend more intensive surveillance for individuals at higher risk for CRC.^{6,8,21,32} Individuals at higher risk for CRC include (1) individuals with a history of adenomatous polyps; (2) individuals with a personal history of curative-intent resection of CRC; (3) individuals with a family history of either CRC or colorectal adenomas diagnosed in a first-degree relative before age 60 years; (4) individuals at significantly higher risk due to a history of inflammatory bowel disease of significant duration; or (5) individuals at significantly higher risk due to a known or suspected presence of one of 2 hereditary syndromes, specifically hereditary nonpolyposis colon cancer or familial adenomatous polyposis. For these individuals, increased surveillance generally means a specific recommendation for colonoscopy, if available, and may include more frequent exams and exams beginning at an earlier age. As noted previously, an update in recommendations for follow-up colonoscopy for individuals with a history of adenomatous polyps or personal history

of curative-intent CRC was issued in 2006 jointly by the ACS and the USMSTF.^{8,9}

SCREENING FOR ENDOMETRIAL CANCER

In 2001, the ACS concluded that there was insufficient evidence to recommend screening for endometrial cancer in women at average risk or somewhat increased risk due to history of unopposed estrogen therapy, tamoxifen therapy, late menopause, nulliparity, infertility or failure to ovulate, obesity, diabetes, or hypertension.⁶ The ACS recommends that women at average and increased risk should be informed about risks and symptoms of endometrial cancer (in particular, unexpected bleeding and spotting) at the onset of menopause and should be strongly encouraged to immediately report these symptoms to their physicians (Table 2). Women at very high risk for endometrial cancer due to (1) known hereditary nonpolyposis CRC genetic mutation-carrier status; (2) substantial likelihood of being a mutation carrier (ie, a mutation is known to be present in the family); or (3) absence of genetic testing results in families with suspected autosomal dominant predisposition to colon cancer should consider beginning annual testing for early endometrial cancer detection at age 35 years. The evaluation of endometrial histology with the endometrial biopsy is still the standard for determining the status of the endometrium.³³ High-risk women should be informed that the recommendation for screening is based on expert opinion, and they also should be informed about potential benefits, risks, and limitations of testing for early endometrial cancer detection.

TESTING FOR EARLY PROSTATE CANCER DETECTION

ACS guidelines for testing for early prostate cancer detection were last updated in 2001, and a review and update of the current guidelines will be initiated in 2008. Because the current evidence about the value of testing for early prostate cancer detection is insufficient to recommend that average-risk men undergo regular screening, the ACS recommendations emphasize the importance of shared decision making about testing.⁶ The ACS recommends that the prostate-specific

antigen (PSA) blood test and DRE should be offered annually beginning at age 50 years to men who have a life expectancy of at least 10 years. Before any decision about testing, a discussion should take place about the potential benefits, limitations, and harms associated with testing (Table 2). In men for whom DRE is an obstacle to testing, PSA alone is an acceptable alternative.

The ACS Prostate Cancer Advisory Committee placed strong emphasis on shared decision making between clinicians and patients, emphasizing that clinical policies that avoid discussing testing, discouraging testing, or recommending testing to all men were inappropriate. In addition, the Advisory Committee concluded that if men ask the clinician to make the testing decision on their behalf following a discussion about benefits, limitations, and risks associated with prostate cancer testing, they should be tested unless other circumstances (ie, limited longevity or other considerations) would discourage testing.

Men at high risk, including men of sub-Saharan African descent and men with a first-degree relative diagnosed at a younger age (ie, <65 years) should begin testing at age 45 years. Men at even higher risk of prostate cancer due to more than one first-degree relative diagnosed with prostate cancer before age 65 years could begin testing at age 40 years, although if PSA is less than 1.0 ng/mL, no additional testing is needed until age 45 years. If PSA is greater than 1.0 ng/mL but less than 2.5 ng/mL, annual testing is recommended. If PSA is 2.5 ng/mL or greater, further evaluation with biopsy should be considered. Informed decision making is no less important for men at high risk, and these recommendations for testing in higher-risk individuals do not preclude the need for testing decisions to be preceded by a process of informed decision making. Men at high risk should have an opportunity to learn about the potential benefits, limitations, and harms associated with testing for and treatment of early-stage prostate cancer.

TESTING FOR EARLY LUNG CANCER DETECTION

At present, neither the ACS nor any other medical/scientific organization recommends testing for early lung cancer detection in asymptomatic individuals. However, the ACS historically has

recognized that patients at high risk of lung cancer due to significant exposure to tobacco smoke or occupational exposures may decide to undergo testing for early lung cancer detection on an individual basis after consultation with their physicians.³⁴ Because of the likelihood that a growing number of individuals would seek testing for early lung cancer detection with spiral computed tomography,³⁵⁻³⁸ the ACS issued a narrative in 2001 emphasizing the importance of shared decision making regarding testing for early lung cancer detection.⁶ The narrative not only emphasized the importance of discussing potential benefits and harms, but also the importance of testing in settings with multidisciplinary expertise in diagnostic workup and treatment. At this time, prospective trials to evaluate the efficacy of lung cancer screening are underway in the United States and Europe, with results expected before the end of the decade.³⁶ An update to the current narrative about shared decision making related to testing for early lung cancer detection is not anticipated until results from prospective clinical trials currently underway are available.

THE CANCER-RELATED CHECKUP

Periodic encounters with clinicians, either for acute care or for checkups, offer the potential for health counseling, cancer screening, and case finding.^{34,39} When individuals see a health care professional for a preventive health examination, there is an opportunity for more comprehensive counseling and testing. These encounters should include the performance of or referral for conventional cancer screening tests as appropriate by age and gender, as described previously, but they also are an opportunity for case-finding examinations of the thyroid, testicles, ovaries, lymph nodes, oral region, and skin. Also, self-examination techniques or increased awareness about signs and symptoms of skin cancer, breast cancer, or testicular cancer can be discussed. Health counseling may include guidance about smoking cessation, diet, physical activity, and shared decision making about cancer screening or testing for early cancer detection for cancer sites where population-based screening is not yet recommended. Whereas in the past the ACS recommended a "cancer-related checkup" in a

manner that implied a stand-alone exam, the recommendation now stresses that the occasion of a general, periodic health examination provides a good opportunity to address examinations and counseling that could lead to prevention and early detection of cancer (see Table 2).

SURVEILLANCE OF CANCER SCREENING: COLORECTAL, BREAST, CERVICAL, AND PROSTATE CANCERS

Data Sources

Estimates of national trends in cancer screening for the period of 1987 to 2005 are based on the NHIS (see Figure 1), and recent updated prevalence estimates are from the Behavioral Risk Factor Surveillance System (BRFSS) conducted in 2006.

The NHIS is a continuing nationwide household survey of the civilian, noninstitutionalized population conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention (CDC). The NHIS is designed to provide national prevalence estimates on personal, socioeconomic, demographic, and health characteristics of the US population. It is the official federal monitoring instrument for the cancer screening objectives for the nation outlined in *Healthy People 2010*.⁴⁰ Surveys are administered by trained interviewers, and participants within a household are randomly selected to participate in the core health components of the survey. Hispanics and Blacks are oversampled in the survey to help improve the precision of the estimates for those populations.

The NHIS prevalence estimates of cancer screening presented here are weighted and age-adjusted to the 2000 standard population to provide population-based prevalence estimates of the US adult population.⁴⁰ The assessment of cancer screening for cervical and breast cancers was available for the following survey years of the NHIS: 1987, 1992, 1998, 2000, 2003, and 2005.

To better reflect changes in current practice and evidence for the effectiveness of different screening strategies for CRC screening, in 2000, the NHIS questions were revised to improve the estimates of the proportion of age-eligible adults receiving recommended CRC tests for screening. For example, the NHIS 2000 and 2005

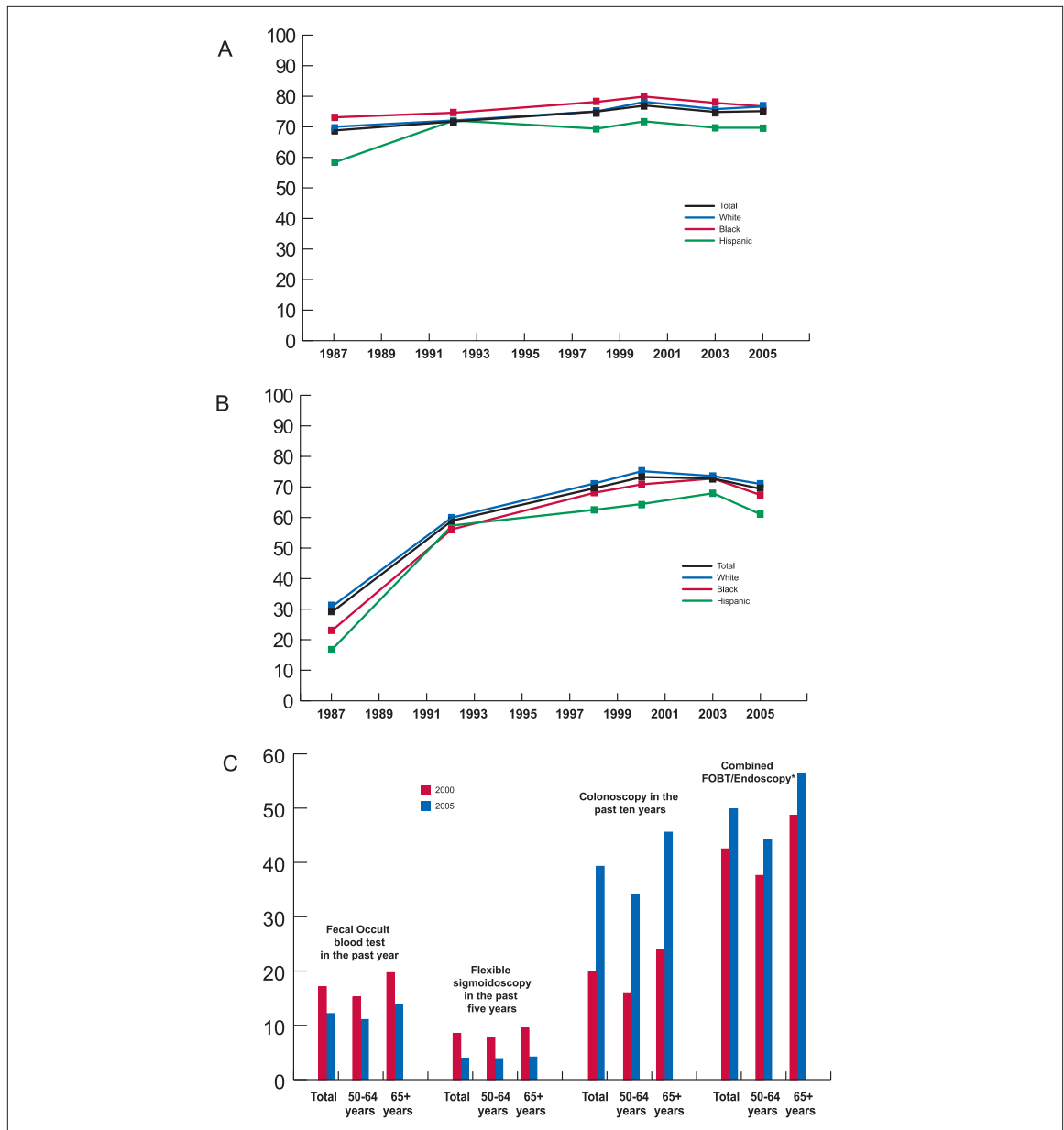


FIGURE 1 (A) Percent of Women Aged 18 Years and Older Who Report a Pap Test Within the Past 3 Years, by Race and Ethnicity, National Health Interview Survey (NHIS) 1987 to 2005. (B) Percent of Women Aged 40 Years and Older Who Report a Mammogram Within the Past 2 Years, by Race and Ethnicity, NHIS 1987 to 2005. (C) Percent of Adults Who Report a Recent Colorectal Cancer Screening Test Within Recommended Time Intervals by Age, NHIS 2000 to 2005. *Either a fecal occult blood test within the past year or sigmoidoscopy in the past 5 years or colonoscopy within the past 10 years. Total rates are age-adjusted to the 2000 US standard population. Source: National Health Interview Survey Public Use Data File 2000, 2005. National Center for Health Statistics, Centers for Disease Control and Prevention, 1999.

CRC screening questions for FOBT refer specifically to the home-based test method (and exclude in-office FOBT). Although in-office and/or single-sample DRE is not recommended since it has very low sensitivity for cancer and advanced adenomas,^{29,41} it nonetheless has been shown to be a common procedure used by health

professionals for screening.³⁰ For CRC screening endoscopy, the NHIS 2000 and 2005 questions ask about the use of any of the 3 different endoscopy procedures (eg, “Have you ever had a sigmoidoscopy, colonoscopy, or proctoscopy?”), and standard text describing the procedures is read to participants to aid recall when responding to

TABLE 3 Prevalence (%) of Recent Cancer Screening Examinations Among US Adults by Health Insurance Coverage and Race and Ethnicity, Behavioral Risk Factor Surveillance System, 2006⁴³

	US Adults		Non-elderly (Under Age 65 Years)		Aged 65 Years and Older		White, Non-Hispanic		Black, Non-Hispanic		Other Race, Non-Hispanic		Hispanic			
	Overall	95% CI	Have Health Insurance	No Health Insurance	Have Health Insurance	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI	95% CI		
															95% CI	95% CI
Colorectal cancer (adults aged 50 years and older)																
Either a flexible sigmoidoscopy or colonoscopy*	56.3	(55.8-56.7)	53.0	(52.3-53.6)	24.6	(23.0-26.3)	60.7	(60.0-61.3)	58.1	(57.7-58.6)	53.8	(52.0-55.5)	49.2	(45.7-52.6)	42.8	(40.1-45.5)
FOBT (FOBT home kit)†	16.4	(16.1-16.8)	14.1	(13.7-14.6)	8.0	(7.1-8.9)	20.0	(19.5-20.5)	16.7	(16.3-17.0)	17.1	(15.9-18.4)	16.7	(13.9-19.9)	12.5	(10.9-14.4)
FOBT or endoscopy‡	60.4	(60.0-60.9)	57.3	(56.7-58.0)	28.6	(27.0-30.4)	65.4	(64.8-66.1)	62.3	(61.8-62.7)	58.2	(56.5-59.8)	53.7	(50.3-57.1)	46.7	(44.0-49.5)
Breast cancer (women aged 40 years and older)																
Mammogram§	60.8	(60.3-61.3)	62.7	(62.1-63.4)	34.8	(32.8-36.7)	65.3	(64.5-66.1)	60.9	(60.4-61.4)	62.8	(61.1-64.4)	59.4	(55.8-62.9)	59.8	(57.3-62.3)
Mammogram and clinical breast exam	53.0	(52.5-53.5)	56.8	(56.1-57.5)	30.2	(28.4-32.2)	52.6	(51.7-53.4)	53.7	(53.2-54.2)	53.9	(52.2-55.7)	48.5	(44.9-52.2)	49.2	(46.5-51.9)
Cervical cancer (women aged 18 years and older)																
Pap test¶	83.3	(82.9-83.8)	88.5	(87.9-89.0)	71.3	(69.9-72.3)	71.5	(70.4-72.5)	83.9	(83.4-84.4)	86.1	(84.8-87.3)	76.3	(73.2-79.1)	81.8	(79.9-83.4)
Prostate cancer (men aged 50 years and older)																
Prostate-specific antigen#	55.4	(54.6-56.2)	51.2	(50.2-52.3)	27.3	(24.0-30.9)	63.8	(62.6-65.0)	57.1	(56.3-57.8)	52.7	(49.5-55.8)	45.7	(40.5-51.0)	46.3	(41.6-51.0)
Digital rectal exam**	51.1	(50.4-51.9)	49.3	(48.2-50.4)	22.7	(20.1-25.5)	57.1	(55.9-58.3)	53.1	(52.4-53.9)	47.3	(44.2-50.4)	40.5	(35.5-45.7)	40.7	(36.2-45.3)

Prevalence is weighted and age-adjusted using the 2000 Census.

*Recent sigmoidoscopy or colonoscopy test within the preceding 10 years.

†Recent FOBT using a home-kit test performed within the preceding year.

‡Recent FOBT using a home-kit test performed within the preceding year or recent sigmoidoscopy or colonoscopy test within the preceding 10 years.

§Women aged 40 years and older who had a mammogram in the last year.

¶Women who had a Pap test within the preceding 3 years.

#A prostate-specific antigen test within the past year for men who have not been told they have had prostate cancer.

**A digital rectal examination within the past year for men who have not been told they have had prostate cancer.

Abbreviations: CI, confidence interval; FOBT, fecal occult blood test.

subsequent questions about the timing of the most recent procedure they had.⁴² Thus, trends presented here are based on the new set of CRC screening questions in the NHIS 2000 and 2005. Trends in cancer screening by race and ethnicity (non-Hispanic Whites, non-Hispanic Blacks, and Hispanics) are depicted for the period between 1987 and 2005 in Figure 1.

The second data source for this section is the CDC's BRFSS survey conducted in 2006, which also is the most recent year that the survey included a comprehensive set of questions to assess prevalence of cancer screening for breast, cervical, and CRC, and testing for early prostate cancer detection. The BRFSS provides state-specific estimates of behavioral risk factors from ongoing statewide telephone surveys of civilian, noninstitutionalized adults (ie, persons aged 18 years or older living in households with a telephone). The BRFSS is conducted annually in all 50 states, the District of Columbia, and Puerto Rico by state health departments in collaboration with the CDC. The BRFSS survey methodology includes standardized core questionnaires, complex multistage cluster-sampling designs, and random-digit dialing methods to select households with telephones. Data are weighted to provide prevalence estimates representative of the state's adult population. From its inception, the focus of the BRFSS has been to establish a state-specific surveillance system for the collection of population-based health behaviors, sociodemographics, use of preventive services (ie, use of early-detection tests for cancer), health care access factors (ie, health insurance coverage, having a usual source of care and a regular health care provider), and other health status determinants of the general population.⁴³ A specialized statistical software for the analysis of surveys was used to compute the age-adjusted weighted prevalence estimates (and standard errors) for the United States based on the combined state-level weighted data of states participating in the BRFSS in 2006.⁴⁴ The 95% confidence intervals (95% CI) were calculated using information from the standard error of the estimates.

Estimates in Table 3 reflect an assessment of recent use of screening tests for cancers of the breast, cervix, colon and rectum, and testing for early prostate cancer detection based on

self-reports. Because the BRFSS does not include additional questions about the frequency of screening during a given period, the data presented in Table 3 cannot be interpreted as a measure of routine use of screening tests for these cancers. Moreover, direct comparisons of estimates derived from the BRFSS and the NHIS cannot be made because of the different methodologies, although measures from both surveys tend to provide similar national estimates.⁴⁵ Table 3 also shows the variation in cancer screening prevalence by race and ethnicity and by health insurance coverage in individuals aged fewer than 65 years and those aged 65 years and older. To highlight the impact of health insurance as a determinant of use of or access to cancer screening, health insurance status for persons aged fewer than 65 years was classified based on whether survey respondents had or did not have any kind of health care coverage.

Trends in Cancer Screening by Racial and Ethnic Patterns

National trends are monitored to assess the dissemination of established screening modalities into clinical and community practice. When presented by race and ethnicity, it helps identify segments of the population in need of enhanced efforts in cancer control. In this section, results on cancer screening trends for cervical, breast, prostate, and CRC are presented for all race/ethnic groups combined, and separately for non-Hispanic Whites, non-Hispanic Blacks, and Hispanics. Insufficient sample size in the NHIS precludes the estimation of reliable cancer screening estimates for other ethnic groups; however, information about ethnic subgroups is available from other state surveys, such as the California Health Interview survey.^{46,47}

Cervical Cancer Screening Trends

Between 1987 and 2000, the proportion of women aged 18 years and older who had a recent (within the last 3 years) Pap test increased by 11% in women of all race/ethnic groups, with the largest percentage increase (18%) occurring among Hispanic women. However, from 2000 to 2005, among all race/ethnic groups there were slight declines in the proportion of women reporting a recent Pap test, with an overall drop

of 1.7 percentage points (Figure 1-Panel A). In 2005, 79.6% of women reported a Pap test within the past 3 years.

Breast Cancer Screening Trends

Mammography trend data between 1987 and 2000 showed impressive progress in breast cancer screening rates across all race/ethnic groups. In 1987, the proportion of women aged 40 years and older reporting a recent mammogram was under 30%, but by 2000, the proportion of women having a recent mammogram (within the last 2 years) increased by 140% to 70.3%, overall. Large increases in reported use of mammography occurred in White, Black, and Hispanic women. However, after these robust increases, the estimates from the most recent survey in 2005 showed a 3.4% decline in prevalence of screening compared with the rate in 2000 (from 70.3% to 66.9%). Moreover, the decline was similar in magnitude across race/ethnic groups and in most socioeconomic subgroups of women (Figure 1-Panel B: Whites from 72.2% to 68.2%; Blacks from 68% to 64.6%; and Hispanics from 61.8% to 58.8%). Data from these surveys cannot provide direct evidence of underlying factors associated with the decline in use of mammography. It has been suggested that a decline in postmenopausal hormone therapy use is a factor in declining breast cancer screening rates. If women are less likely to see a clinician for management of postmenopausal hormone use, then there may be reduced opportunity for a recommendation to get a mammogram.⁴⁸

CRC Screening Trends

Results from the NHIS 2000 and 2005 indicate that recent use of CRC screening among adults aged 50 to 64 years and 65 years and older has improved over the 5-year period. Recent screening, defined as reporting having had an FOBT home test in the past year, a sigmoidoscopy in the past 5 years, or colonoscopy in the past 10 years, increased from 37.6% to 44.2% in adults aged 50 to 64 years and from 48.7% to 56.4% in adults aged 65 years and older. Moreover, during this period, the prevalence of colonoscopy use increased from 20% to 39.2%, while FOBT use with the home-kit method declined from 17.1% in 2000 to 12.1%, and use of FSIG declined from 8.5% to 3.9% (Figure 1-Panel C). Meissner and

colleagues²⁸ have shown that the recent increase in the use of endoscopy screening for CRC has largely been specific to an increase in colonoscopy screening, particularly among adults aged 65 years and older (Figure 1-Panel C). Contributing factors for the faster uptake in colonoscopy screening include the recent extension of Medicare coverage for screening colonoscopy to average-risk beneficiaries, media influence (eg, Katie Couric's televised colonoscopy in 2000),⁴⁹ and possibly the differential in reimbursement between colonoscopy procedures and sigmoidoscopy procedures, which makes the latter increasingly unattractive to primary care physicians.

Skin Cancer Screening Examination by a Provider

Skin examinations for the detection of skin cancer are relatively uncommon among US adults, and data from NHIS 2000 and 2005 show little change in the proportion of adults reporting having ever had a skin exam or a recent examination of their skin. A prior report that examined skin cancer screening (defined as "head-to-toe skin examination by a dermatologist/doctor") using the NHIS 2000 found that 14.5% of adults aged 18 years and older reported having ever had a skin cancer screening exam by a doctor.⁵⁰ Of these, 8% reported having had a recent skin cancer screening exam performed by a provider. In the NHIS 2005, 17% of adults aged 18 years and older reported having ever had a skin cancer screening exam by a doctor, while the proportion of those having had a recent skin cancer screening exam performed by a provider was 9%.

Prevalence of Cancer Screening by Health Insurance Status and Ethnicity—BRFSS 2006

Cervical Cancer Screening

In 2006, 83.3% of women aged 18 years and older with an intact uterus reported having had a Pap test in the preceding 3 years. The lowest prevalence of Pap-test screening occurred among women aged 18 to 64 years who lacked health care coverage (71.3%) and in women of other races (76.3%) (Table 3).

Breast Cancer Screening

In 2006, the proportion of women aged 40 years and older who reported having had a

mammogram in the last year was 60.8%, while 53% reported having had both a mammogram and a CBE in the last year (Table 3). Uninsured women aged 40 to 64 years were less likely to have had a mammogram in the previous year (34.8%) compared with women with health insurance (62.7%) and less likely to have had both a mammogram and CBE (30.2% versus 56.8%). Hispanic women and women of other races were less likely to have had a mammogram (59.8% and 59.4%, respectively) or both a mammogram and CBE (49.2% and 48.5%, respectively) compared with either non-Hispanic White or Black women.

CRC Screening

The prevalence of recent CRC screening with endoscopy (ie, FSIG or colonoscopy) was more than twice the prevalence of screening with FOBT among both men and women, consistent with the pattern that was observed in the NHIS data. While the BRFSS endoscopy measure does not distinguish between sigmoidoscopy and colonoscopy, given the more rapid recent uptake of colonoscopy and the decline in the use of FSIG,^{28,51} estimates are conformed to the colonoscopy screening interval (10 years), and thus, a small percentage of adults who have had a sigmoidoscopy more than 5 but fewer than 10 years before the survey would be included in the proportion of adults estimated to be adherent with screening recommendations.

In 2006, among adults aged 50 years and older, the prevalence of CRC screening with endoscopy procedures within the past 10 years was 56.3%, and the prevalence of having done an at-home FOBT within the past year was 16.4%. Among adults aged 50 years and older, the prevalence of having had recent screening with either FOBT or endoscopy was 60.4%. Uninsured nonelderly adults were significantly less likely to report recent CRC screening compared with older or insured adults, and the differences were more pronounced for recent endoscopy compared with recent FOBT, likely due to the higher cost of these procedures. Whereas 53% of adults (aged 50 to 64 years) with health insurance reported recent endoscopy, the rate for uninsured adults was only 24.6% (Table 3). Hispanics and persons of other races were less likely to report having recent endoscopy or FOBT testing compared with both

non-Hispanic White or Black adults. No data are available from the BRFSS to estimate use of the DCBE, which has declined in use.⁵²

Testing for Early Prostate Cancer Detection

Questions about recent testing for early prostate cancer detection are limited to men without a prior diagnosis of prostate cancer. In 2006, the proportion of men aged 50 years and older who reported having been tested for early prostate cancer detection in the past year with a PSA blood test was 55.4%, and with a DRE was 51.1%. Men aged 50 to 64 years who lacked health care coverage were about half as likely to have had a PSA or a DRE compared with men in the same age range who had health care coverage (Table 3). Compared with non-Hispanic White men, Hispanic men, non-Hispanic Black men, and men of other races were less likely to have had a PSA or a DRE (Table 3). Current guidelines stress the importance of shared decision making in average-risk men rather than a direct endorsement of screening. In the 2000 NHIS, approximately two-thirds of men who reported that they had been tested with PSA also reported that they had a discussion with their physician about the advantages and disadvantages of PSA testing.⁵³ However, some evidence suggests that most men still have limited understanding of the benefit versus risk issues,⁵⁴ and in one study, men reported that they had more autonomy than desired in the decision process.⁵⁵ Achieving high quality in the process of informed and shared decision making related to testing for early prostate cancer detection is especially challenging given that the issue is controversial and complicated, and achieving a good understanding of the issues may require more time than generally is available in the primary care environment.

DISCUSSION

The improving rates of cervical and breast cancer screening utilization among minority women since the early 1990s may be a reflection of the positive impact the CDC's National Breast and Cervical Cancer Early Detection Program has had in increasing access and coverage for breast and cervical cancer screening.⁵⁶ Since its inception in 1991, the National Breast and Cervical Cancer Early Detection Program has provided

over 5 million⁵⁷ screening examinations to medically underserved women through improved outreach, public, and professional education; improved access to services; diagnostic evaluation; case management; treatment services; and quality-assurance measures.⁵⁷ The program also likely has stimulated the development of local programs with the same aims. Although Hispanic/Latinos have been less likely to have recent cancer screening compared with non-Hispanic Whites and Blacks, screening rates are improving in this ethnic group. Hispanic/Latinos in the United States are a heterogeneous population with different countries of origin and immigration histories, and Hispanic subgroups differ on cultural, socioeconomic, and health-related systems barriers that influence their receipt of preventive services, including cancer screening.^{58,59}

Reducing health insurance-related disparities in CRC screening is also an important challenge, one that affects men as well as women. Following on the success of collaborations with state health departments, the CDC has a CRC screening pilot program underway at 5 sites across the nation. The goal of this pilot program is to explore the feasibility of establishing a national CRC screening program for the medically underserved and to explore the viability and cost-effectiveness of alternative settings and program models. For example, Maryland's program encompasses education to providers and the public, as well as provision of CRC testing to qualified low-income, uninsured residents. Between 2002 and 2006, Maryland's CRC screening rates increased overall, and there were clear reductions in CRC screening disparities among low-income minorities.⁶⁰

At the national level, since 2000, the prevalence of CRC screening (particularly colonoscopy testing) has improved, and current estimates indicate that approximately half of the age-eligible population has recently been screened for CRC. Trends indicate that much of the steady increase in CRC screening is due to greater uptake of colonoscopy; the utilization of colonoscopy by adults aged 50 years and older increased from 20% in 2000 to 39.2% in 2005, whereas use of other test options (at-home FOBT and sigmoidoscopy) declined during this period. Although clear, steady improvements in CRC screening rates have occurred, current rates still are not

optimal. Thus, greater and perhaps more creative approaches are needed to improve and sustain increases in public awareness of the importance of regular CRC screening, to increase incentives for health care professionals and the implementation of systems that are supportive of regular CRC screening, and to expand community programs that can increase access to CRC screening in medically underserved populations. An example of such a strategy is the National Colorectal Cancer Roundtable's *Clinician Guide and Toolbox*, which provides practice essentials and tools to assist clinicians to ensure that each and every appropriate patient undergoes screening for CRC.⁶¹

Based on national data for the period of 2000 to 2005, trends in recent mammogram use showed declines in recent screening (3% points overall) across sociodemographic groups.⁴⁸ Coincidentally, a recent analysis of breast cancer incidence showed a downturn in breast cancer incidence rates that began in 1998/1999 in all age groups of women aged 45 years and above.⁶² According to the authors, this declining incidence pattern is explained by the apparent lack of increased penetrance of mammography (as it reached a plateau since 2000) and consequently led to a reduced pool of undiagnosed prevalent cases.⁶² Precisely what factors are implicated in the lack of sustained improvements in mammography utilization is not fully understood; however, declining numbers of mammography facilities and certified mammography units and other access-related influences may be contributing factors.⁶³ The uncertainty related to factors associated with the recent downturn is further complicated by data from the most recent BRFSS, which showed that the proportion of women aged 40 to 64 years who reported a recent mammogram was slightly higher in 2006 compared with 2004 (61.8% versus 58%).⁶⁴ Clearly, ongoing monitoring of mammography at the national level will clarify whether these trends are, in fact, stabilizing. However, as noted previously, prevalence indicators derived from a telephone survey may be relatively inaccurate indicators of regular adherence to screening. Carney and colleagues compared New Hampshire population data from the 2000 Census with data from the statewide mammography registry and observed

that more than half of women either had never had a mammogram or had not had one within 27 months and that the remainder of women (41%) were being screened at intervals that approximated annual or biennial screening.⁶⁵ There is a need for better understanding of factors associated with both irregular as well as regular adherence with screening recommendations since repeated participation in mammography screening over time and at recommended intervals is the key to reducing breast cancer-related morbidity and mortality.^{12,66,67}

Based on estimates from the most recent BRFSS data, there has been little change in the proportion of women aged 18 to 64 years reporting a recent Pap smear in 2006. Current patterns indicate that some women who need a Pap test have not received one, and as well, that there is considerable overutilization of cervical cancer screening. In this journal, Solomon et al used historical cervical cancer screening data from the NHIS to project the expected number of Pap tests that would be performed through 2010 under alternative scenarios based on ACS screening guidelines.⁶⁸ The authors estimate that in 2003, approximately 65.6 million Pap tests were performed on US women, of which 15% were on women with a prior hysterectomy, most (90%) of whom are not candidates for Pap testing according to current guidelines.⁴ Based on trends between 1993 and 2003, the authors project that in 2010, approximately 75 million Pap tests will be performed on US women, if current patterns persist, and that this number might be halved if women and health care professionals were more adherent with current recommendations.

In order to better understand the potential impact of the introduction and uptake of HPV testing on traditional screening methods for cervical cancer, more comprehensive population-based tracking systems need to be modified.⁶⁹ In a recent evaluation of cervical cancer screening practices among a nationally representative survey of clinicians within specialties that commonly provide cervical cancer screening, Saraiya and colleagues found that approximately 20% of providers used HPV DNA testing as an adjunct to screening cytology, and two-thirds used HPV DNA testing to manage patients who had abnormal cytology test results.⁷⁰ However, more than a

third of physicians reported also using HPV testing for clinical circumstances not approved by the Food and Drug Administration, such as screening women younger than age 30 years and as a primary screening test for cervical cancer instead of the Pap smear.

Compared with 2004, rates for testing for early prostate cancer detection also have remained the same. Insofar as shared and informed decision making is at the core of guidance related to testing for early prostate cancer detection, survey questions related to testing with PSA and/or DRE should be preceded with questions related to counseling about testing, an assessment of the degree of satisfaction with the process, and the decision that was reached.

Between 2004 and 2006, there was no change in the prevalence of cancer screening reported by individuals without health care coverage, with the exception of cervical cancer screening, where screening rates in the uninsured were slightly higher. Generally, screening rates among individuals without health care coverage are approximately half the rate of those adults with health care coverage. Access to health care remains an important barrier to cancer control and influences cancer prevention, treatment, and survival outcomes.^{71,72} Yet, as the data on cancer screening trends presented in this and previous reports reveal, numerous factors alone and together account for considerable underutilization of cancer screening in the United States. Having health insurance, a regular doctor, and a regular source of usual care all are associated with receipt of preventive health care and higher cancer screening rates. Where these structural supports are absent, cancer screening rates are considerably lower.⁷²⁻⁷⁵ Current trends suggest that these key structural supports are eroding further. Despite recent efforts to expand coverage, the number of uninsured Americans grew to nearly 47 million in 2006, an increase of 7.2 million since 2001.⁷⁶

At present, the ACS and US Preventive Services Task Force and other organizations endorse population screening for cancers of the cervix, breast, and colon and rectum.⁷⁷ Where there is insufficient evidence to recommend for or against cancer screening for some other cancers, the ACS and other organizations provide guidance to the public and health care professionals about what is

known and not known about benefits, limitations, and harms associated with testing so that individuals can make informed decisions about testing for early cancer detection in the presence of scientific uncertainty. This guidance is offered without endorsement for or against testing since early cancer detection tests may be promoted to individuals or sought by individuals before there is scientific certainty that it is valuable. Cancers of the prostate, endometrium, and lung are notable examples.

As noted previously, regular preventive health examinations provide opportunities for counseling, screening, and even case finding. On the occasion of a checkup, there is a greater opportunity for health care professionals to recommend cancer screening, and these recommendations have been shown to be a key predictor of screening. The likelihood that patients will receive this recommendation is higher if they see a health care professional for a checkup as opposed to episodic care for other reasons.^{78,79} Taking advan-

tage of opportunities for prevention during encounters for other reasons is important, as is prioritizing prevention and early detection recommendations when there is limited time for counseling.⁸⁰ However, as a single strategy for delivering preventive health care, addressing prevention and early detection needs during encounters for other health problems is hopelessly inefficient and has very limited potential to contribute to the broader range of prevention and early detection recommendations.⁸¹

As the nation begins to more seriously consider the importance of health care reform and as alternative models are considered, it is critical that we focus not just on payment systems and cost containment but, in fact, place the highest priority on designing new access and preventive care delivery models that will result in significantly diminished disability and premature mortality from cancer and other leading chronic conditions.

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