American Cancer Society Guidelines for the Early Detection of Cancer, 2005

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ABSTRACT   Each January, the American Cancer Society (ACS) publishes a summary of its recommendations for early cancer detection, including guideline updates, emerging issues that are relevant to screening for cancer, and a summary of the most current data on cancer screening rates for US adults. In 2004, there were no updates to ACS guidelines. In this article, we summarize the current guidelines, discuss recent evidence and policy changes that have implications for cancer screening, and provide an update of the most recent data pertaining to participation rates in cancer screening by age, gender, and insurance status from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System. (*CA Cancer J Clin 2005;55:31–44.*) © *American Cancer Society, Inc., 2005.*

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INTRODUCTION

Five years ago, the American Cancer Society (ACS) began a yearly report on its cancer detection guidelines, current issues related to screening and/or testing for the early detection of cancer, and updates on cancer screening rates.[1] The first report also included a description of the ACS process for the development or update of a cancer screening guideline. These yearly reports provide a regular, summary source for ACS guidelines related to cancer screening, or testing for early cancer detection in those instances where mass screening is not recommended. The report also summarizes background and rationale for guidelines that have been recently updated in the prior year, announcements of upcoming guideline reviews, recent data and issues pertaining to early cancer detection, and a summary of the most recent data on adult cancer screening rates.[1–5]

In 2001, the ACS published revisions in the early detection guidelines for colorectal cancer, endometrial cancer, and prostate cancer, and an updated narrative related to testing for early lung cancer detection.[2] Guidelines for cervical cancer screening were updated in 2002,[6] and in 2003, guidelines for the early detection of breast cancer and a modification of the recommendations for stool blood testing for colorectal cancer screening were published.[7,8] Annual guideline reviews, as well as the more detailed guideline updates, are available online at http://CAonline. AmCancerSoc.org.

SCREENING FOR BREAST CANCER

ACS guidelines for breast cancer screening were last updated in 2003 (Table 1).[7] Guidelines for the early detection of breast cancer in average–risk women emphasize a process that begins after a woman is 20 years of age and consist of a combination of clinical breast examination (CBE), counseling to raise awareness of breast symptoms, and eventually regular mammography.

CBE should take place every 3 years between the ages of 20 and 39 and annually for women aged 40 and older. This examination should take place during periodic health examinations, and it provides an opportunity to assess risk, discuss the importance of early detection, discuss the importance of regular mammography in women 40 years of age and older, and answer any questions women may have about their own risk, new technologies, or other matters relating to breast disease. It also is an occasion during which women who choose to do breast self–examination (BSE) can have their technique reviewed. The ACS no longer recommends monthly BSE beginning at age 20 and instead

TABLE **1** 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+	Breast self-examination (BSE)	Beginning in their early 20s, women should be told about the benefits and limitations of breast self-examination (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.
		Clinical breast examination (CBE)	For women in their 20s and 30s, it is recommended that clinical breast examination (CBE) be part of a periodic health examination, preferably at least every three years. Asymptomatic women aged 40 and over should continue to receive a CBE as part of a periodic health examination, preferably annually.
		Mammography	Begin annual mammography at age 40.*
Colorectal	Men and women, aged 50+	Fecal occult blood test (FOBT), or fecal immunochemical test (FIT)†	Annual, starting at age 50.
		Flexible sigmoidoscopy	Every 5 years, starting at age 50.
		Fecal occult blood test (FOBT),† or fecal immunochemical test (FIT), and flexible sigmoidoscopy	Annual FOBT or FIT, and flexible sigmoidoscopy every 5 years, starting at age 50.
		Colonoscopy	Every 10 years, starting at age 50.
		Double contrast barium enema	Every 5 years, starting at age 50.
Prostate	Men, aged 50+	Digital rectal examination (DRE) and prostate-specific antigen test (PSA)	The PSA test and the DRE should be offered annually, starting at age 50, for men who have a life expectancy of at least 10 years.§
Cervix	Women, aged 18+	Pap test	Cervical cancer screening should begin approximately three years after a woman begins having vaginal intercourse but no later than 21 years of age. Screening should be done every year with conventional Pap tests or every two years using liquid-based Pap tests. At or after age 30, women who have had three normal test results in a row may get screened every two to three years with cervical cytology (either conventional or liquid-based Pap test) alone, or every three years with an HPV DNA test plus cervical cytology. Women 70 years of age and older who have had three 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 check-up	Men and women, aged 20+		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, annual clinical breast examination should be performed prior to mammography.

†FOBT for colorectal cancer screening, as it is sometimes done in physicians' offices with the single stool sample collected on a fingertip during a digital rectal examination, is not an adequate substitute for the recommended at-home procedure of collecting two samples from three consecutive bowel movements, and is not recommended. Toilet bowl FOBT tests also are not recommended. In comparison with guaiac-based tests for the detection of occult blood, immunochemical tests are more patient-friendly and are likely to be equal or better in sensitivity and specificity. There is no justification for repeating FOBT in response to an initial positive finding.

‡Flexible sigmoidoscopy together with FOBT is preferred compared with FOBT or flexible sigmoidoscopy alone.

§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.

recommends that women should be informed about the potential benefits, limitations, and harms (ie, false-positive results and other factors) associated with BSE. Women may choose to do BSE regularly, occasionally, or not at all. The change in the recommendation to do monthly BSE was based on the absence of strong evidence supporting the value of BSE,[9] as well as new evidence suggesting limited benefit from teaching BSE in populations in which women have high awareness about breast cancer and are responsive to the new breast symptoms.[10] Thus, while BSE may be an effective method for increasing awareness about breast changes, other paths to acquiring and maintaining high awareness about breast changes and the importance of prompt response are also possible.[11] The new guidelines place a strong emphasis on the health care professional's role in raising and regularly reinforcing awareness about breast cancer, early breast cancer detection, and the importance of prompt reporting of any new symptoms.

The ACS recommends that average-risk women should begin annual mammography at the age of 40. Women also should be informed about the benefits, limitations, and potential harms associated with mammographic screening. The importance of adhering to a schedule of annual mammograms also should be stressed. With respect to the age to stop screening mammography, the ACS recommends that these decisions should be individualized considering the potential benefits and risks of screening in the context of overall health status and longevity. The guidelines narrative highlighted the tendency of clinicians to underestimate longevity in older women and cautioned against discounting the benefit of screening in women who would still likely benefit from early detection. As long as a woman is in good health and would be a candidate for treatment, she should continue to be screened with mammography.

Women at High Risk

The 2003 update of the breast cancer screening guidelines also addressed issues related to screening high-risk groups.[7] Although there are not sufficient data to recommend a specific surveillance strategy for younger women at higher risk, the ACS guidelines state that women at increased risk for breast cancer may benefit from earlier initiation of screening, screening at shorter intervals, and the screening with additional modalities such as ultrasound or magnetic resonance imaging (MRI).

In the past year, there have been several reports comparing the effectiveness of CBE, ultrasound, mammography, and MRI in high-risk women. Kriege et al.[12] reported findings from a Netherlands study comparing the efficacy of CBE, mammography, and MRI in a group of 1,909 women at high risk. Women in this study had a cumulative lifetime risk of breast cancer of 15% or more, and 358 were carriers of germ-line mutations of known susceptibility to breast cancer. Women were screened every 6 months with CBE and annually with mammography and MRI, with independent interpretation of the imaging examinations. Over the duration of the study (median follow-up period of 2.9 years), 44 invasive breast cancers, 6 cases of ductal carcinoma in situ, and 1 case of lobular neoplasia were detected. The investigators reported significantly superior sensitivity of MRI in the detection of invasive breast cancer (79.5%) compared with mammography (33.3%) and CBE (17.9%). More importantly, MRI was superior to mammography in finding tumors smaller than 1 cm (43.2% versus 14%), and detecting breast cancers while they were still localized to the breast (21.4% versus 52.4%). Similar results were reported by Warner and colleagues,[13] who compared the sensitivity and specificity of mammography, ultrasound, MRI, and CBE in a group of 236 Canadian women aged 25 to 65 years with known *BRCA1* or *BRCA2* mutations. In this surveillance program for high-risk women, CBE was conducted on the day of the imaging examination and then at 6-month intervals; all imaging examinations were conducted annually and interpreted independently. The investigators estimated sensitivity and specificity for each of the four modalities and then compared the sensitivity of all four screening tests combined with the sensitivity of mammography and CBE alone. Of the 22 cancers detected (16 invasive breast cancers and 6 ductal carcinoma in situ), 17 (77%) were detected by MRI compared with 8 (36%) by mammography, 7 (33%) by

ultrasound, and 2 (9.1%) by CBE. The sensitivity of MRI (77%) was twice that of mammography (36%) and ultrasound (36%). The sensitivity of CBE was only 9.1%. In both studies, MRI was less specific than mammography, but lower specificity is likely to be viewed as an acceptable tradeoff for measurably improved sensitivity in a high-risk group.

Both studies showed that multimodal testing was superior to using any one test alone. In particular, Warner et al.[13] showed that all four screening modalities combined had a sensitivity of 95% compared with 45% for combined mammography and CBE. These reports and others have strengthened the evidence supporting the value of MRI for the detection of breast cancer in younger, high-risk women, a group for which screen film mammography is less sensitive.

SCREENING FOR CERVICAL CANCER

ACS guidelines for cervical cancer screening were last updated in 2002 (Table 1).[6] The existing guideline reflects the current understanding of the underlying epidemiology of cervical intraepithelial neoplasia (CIN) and offers varying surveillance strategies based on age, new screening and diagnostic technologies that have emerged since the late 1980s, and the pattern of results over time.

ACS recommends that cervical cancer screening should begin approximately 3 years after the onset of vaginal intercourse but no later than 21 years of age. Screening for cervical cancer should be performed annually until age 30 with conventional cervical cytology smears or every 2 years until age 30 using liquid-based cytology. After age 30, women who have had three consecutive, technically satisfactory normal or negative cytology results may undergo screening every 2 to 3 years using either conventional cervical cytology smears or liquid-based cytology. Alternatively, after meeting the criteria by age 30 that allows for less frequent screening after age 30, an acceptable alternative to periodic screening with cervical cytology alone is human papilloma virus (HPV) DNA testing with conventional or liquid-based cytology, which may be done every 3 years.

Women who choose to undergo HPV DNA testing should receive counseling and education about HPV, and the importance of this counseling should not be underestimated because recent evidence indicates that women are poorly informed about HPV and the risk of cervical cancer.[14,15] Specifically, women should be counseled that a positive HPV test result should not be viewed as indicating the presence of a sexually transmitted disease but rather a sexually acquired infection. The majority of individuals who have had sexual intercourse have been exposed to HPV. The infection is extremely common, and it usually is not detectable or harmful. Furthermore, testing positive for HPV does not indicate the presence of cancer, nor do the large majority of infections foretell an eventual malignancy.

Women aged 70 and older with an intact cervix may choose to cease cervical cancer screening if they have had both three or more documented, consecutive, technically satisfactory normal/negative cervical cytology tests and also have had no abnormal/positive cytology tests within the 10-year period before age 70.

The update of the guidelines also addressed screening for cervical cancer in women for whom additional guidance is relevant, including women with high-risk status and women who have undergone hysterectomy.

Women at High Risk

Women with a history of cervical cancer and/or in utero exposure to diethylstilbestrol (DES) should follow the same guidelines as average-risk women but should continue annual screening after age 30. Women who are immunocompromised by organ transplantation, chemotherapy, or chronic corticosteroid treatment or who test positive for the human immunodeficiency virus (HIV) should follow US Public Health Service and Infectious Disease Society of America guidelines and be tested twice during the first year after diagnosis and annually thereafter.[16] Women with a history of cervical cancer, in utero exposure to DES, and women who are immunocompromised (including those who are HIV positive) should continue cervical cancer screening for as

long as they are in reasonably good health and would benefit from early detection and treatment.

Women with Subtotal or Total Hysterectomy

Women who have had a subtotal hysterectomy should be screened following the recommendations for average-risk women. Cervical cancer screening is not indicated for women who have had a total hysterectomy (with removal of the cervix) for benign gynecologic disease. However, women with a history of CIN 2/3, or women for whom it is not possible to document the absence of CIN 2/3 before, or as the indication for the hysterectomy should be screened until three documented, consecutive, technically satisfactory normal/negative cervical cytology tests and no abnormal/positive cytology tests (within a 10-year period) are achieved. Women with 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 do not have a life-limiting chronic condition.

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

ACS guidelines for screening and surveillance for the early detection of adenomatous polyps and colorectal cancer were updated in 2001 (Table 1), and the recommendations for stool blood testing were modified in 2002 by adding immuno-chemical tests.[2,8] The ACS recommends that average-risk adults should begin colorectal cancer screening at age 50, utilizing one of the following five options for screening: (1) annual fecal occult blood test (FOBT) or fecal immunochemical test (FIT); (2) flexible sigmoidoscopy every 5 years; (3) annual FOBT or fecal immunochemical test plus flexible sigmoidoscopy every 5 years; (4) colonoscopy every 10 years; or (5) double-contrast barium enema every 5 years. These recommendations are nearly identical to guidelines for average-risk individuals issued in 2002 by the US Preventive Services Task Force (USPSTF)[17] and identical to guidelines for average-risk indi-

viduals issued in 2003 by the Multi-Society Task Force, which includes representative gastrointestinal specialty societies as well as representatives from primary care.[18] The USPSTF recommends that clinicians screen all men and women 50 years of age and older for colorectal cancer, citing fair to good evidence that screening methods, including FOBT, flexible sigmoidoscopy, combined FOBT and flexible sigmoidoscopy, colonoscopy, and double contrast barium enema, were effective at reducing mortality from colorectal cancer.[17] Similar to the ACS guidelines, the USPSTF concluded that individual tests varied with respect to the quality of the evidence, magnitude of benefit, and potential for harms but that each method met conventional criteria for cost-effectiveness. While the USPSTF found that there was insufficient evidence to recommend one test over another based on the balance of potential benefits, cost-effectiveness, and potential harms, the ACS reached a similar conclusion but also stressed that variability in access, patient choice, and physician preparedness to support all options meant that current guidelines should include all options as acceptable choices. As additional data become available and as individual choice narrows, the current range of options may grow smaller, or the number of options may remain the same or expand as new technology currently under evaluation acquires sufficient evidence to become a recommended option.

Women and Men at Increased Risk

The ACS recommends more intensive surveillance for (1) individuals at increased risk because of a history of adenomatous polyps; (2) individuals with a personal history of curative-intent resection of colorectal cancer; (3) individuals with a family history of either colorectal cancer or colorectal adenomas diagnosed in a first-degree relative before age 60; (4) individuals at significantly higher risk because of a history of inflammatory bowel disease of significant duration; or (5) individuals at significantly higher risk because of a family history or genetic testing indicating the presence of one of two hereditary syndromes.[2]

The issue of ongoing surveillance for individuals with a history of polyps and/or curative-

intent resection of colorectal cancer has important implications for access to colonoscopy as well as the cost-effectiveness of screening. At a time when screening rates for colorectal cancer with any test still are discouragingly low, take-up of screening appears increasingly tilted toward colonoscopy, with differing opinions as to whether the nation should invest in the capacity to support colonoscopy as the dominant screening test or promote the use of other less costly and less technically complicated testing as a front line for screening and reserve colonoscopy for follow-up and intervention.[19,20] Ongoing debate about screening strategies is likely to continue for the foreseeable future, because not only is access, preference, and use of current tests shifting, but new technologies are being introduced into clinical practice.[21,22] Currently, guidelines for colorectal cancer screening emphasize the acceptability of all options based on evidence of effectiveness and cost-effectiveness, variable access, and variations in individual preferences.[2,17,18,23,24] However, while cost-modeling demonstrates that screening colonoscopy meets conventional criteria for cost-effectiveness, these analyses typically model adherence to recommended guidelines for periodicity and surveillance.[25]

A recent report of patterns of surveillance colonoscopy by physician specialty indicates that there may be significant overuse of surveillance colonoscopy, a pattern that not only has an adverse impact on cost-effectiveness but potentially could reduce timely access to this procedure.[26] Mysliwiec and colleagues[26] reported findings from a nationally representative survey of gastroenterologists and general surgeons related to their perceived need for the frequency of surveillance after polypectomy and compared responses with recommendations from leading medical groups. Although no guideline group recommends increased surveillance after detection of hyperplastic polyps, 24% of gastroenterologists and 54% of general surgeons believed more frequent surveillance was necessary. Significant departures from recommended guidelines toward more frequent, ongoing surveillance were also observed for lower risk adenomas. Baron and colleagues,[27] noting increased demand for colonoscopy after Medicare approval for reimbursement, examined indications for colonoscopy for 498 consecutive patients from a waiting list of 2,400 awaiting colonoscopy and determined 28% of referrals were inappropriate according to current guidelines. Both studies indicate that improved adherence to recommended guidelines will be needed to ensure appropriate use of health care resources and to avoid overtaxing colonoscopy services.

SCREENING FOR ENDOMETRIAL CANCER

In 2001, the ACS concluded that there was insufficient evidence to recommend screening women at average risk for endometrial cancer or women at somewhat increased risk because of history of unopposed estrogen therapy, tamoxifen therapy, late menopause, nulliparity, infertility or failure to ovulate, obesity, diabetes, or hypertension.[2] ACS recommends that women at average and increased risk should be informed about risks and symptoms of endometrial cancer at the onset of menopause (in particular, unexpected bleeding and spotting) and should be strongly encouraged to report any symptoms to their physicians (Table 1). Women at very high risk for endometrial cancer because of (1) known hereditary nonpolyposis colon cancer-associated 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 screening at age 35 because of the high risk of endometrial cancer in these groups and the potentially life-threatening nature of this disease. The endometrial biopsy is still the most common technique used to obtain endometrial tissue, and although other methodologies are under investigation, the evaluation of endometrial histology is still the definitive standard for determining the status of the endometrium.[28] High-risk women should be informed that the recommendation for screening is based on expert opinion in the absence of definitive scientific evidence, and they also should be informed about potential benefits, risks, and limitations of testing for early endometrial cancer detection.

SCREENING FOR PROSTATE CANCER

Guidelines for testing for early prostate cancer detection were last updated in 2001 and reflect the importance of shared decision making about testing at a time when definitive evidence about the value of testing for early prostate cancer detection is insufficient to recommend that average-risk men undergo regular screening.[2] The ACS recommends that the prostate-specific antigen (PSA) test and digital rectal examination (DRE) should be offered annually beginning at age 50 to men who have a life expectancy of at least 10 years (Table 1). In men for whom DRE is an obstacle to testing, PSA alone is an acceptable alternative.

To make a decision about testing for early prostate cancer detection, men should have an opportunity to learn about the potential benefits, limitations, and harms associated with testing for early detection and the treatment of early-stage prostate cancer so that they can make an informed decision with the assistance of a health professional. The guidelines panel also stressed that just as a clinical policy of recommending testing for all average-risk men over age 50 is inappropriate, a clinical policy of not offering testing or discouraging testing in men who request early prostate cancer detection tests likewise is inappropriate. In addition, the ACS guidelines panel concluded that men who ask the clinician to make the testing decision on their behalf should be tested.

Men at High Risk

Men at high risk, including men of African descent (specifically, sub-Saharan African descent) and men with a first-degree relative diagnosed before at a younger age (ie, younger than 65 years) should begin testing at age 45. Men at even higher risk of prostate cancer because of more than one first-degree relative diagnosed with prostate cancer before age 65 could begin testing at age 40, although if PSA is less than 1.0 ng/mL, no additional testing is needed until age 45. 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. Men at high risk also should have an opportunity to learn about the potential benefits, limitations, and harms associated with testing for early detection and treatment of early-stage prostate cancer. Even though testing is recommended for this group, the opportunity to make an informed decision with the assistance of a health professional still is important.

Because PSA is prostate-tissue specific and not prostate-cancer specific, there is no absolute value that is applicable to all men. The range of "normal" PSA levels has conventionally been considered to be between 0 and 4.0 ng/dL. A lower cutoff value of 2.5 ng/dL has been shown to improve the early detection of organ-confined prostate cancers; however, this cutoff value would also increase the number of men undergoing biopsy.

TESTING FOR EARLY LUNG CANCER DETECTION

Currently, the ACS does not recommend testing for early lung cancer detection in asymptomatic individuals at risk for lung cancer. However, the growth in the use of spiral computed tomography (CT) to test for early lung cancer detection as well as the more common use of chest x-ray in former and current smokers led the ACS to update its narrative about lung cancer testing in 2001, emphasizing the importance of informed decisions among individuals at risk who seek testing.[2] The ACS historically has maintained that patients at high risk of lung cancer because of significant exposure to tobacco smoke or occupational exposures and their physicians may decide to undergo testing for early lung cancer detection on an individual basis.[29] The circumstances of individual decision making are more challenging today because of growing evidence indicating a possible benefit from testing for early lung cancer detection with spiral CT. Favorable findings from investigations using low-dose helical CT for testing for early lung cancer detection,[30,31] have led to a large, prospective trial evaluating the relative efficacy of low-dose spiral CT versus chest radiography

for the early detection of lung cancer in current and former smokers[32] as well as direct promotion to the public of spiral CT for early lung cancer detection.

In its narrative, the ACS emphasized the importance of informed decision making for individuals who elect to be tested for early lung cancer detection and recommend that, ideally, testing should be done only in experienced centers that also are linked to multidisciplinary specialty groups for diagnosis and follow-up. Current smokers should be informed that the more immediate preventive health priority is the elimination of tobacco use altogether, because smoking cessation offers the surest route at this time to reducing the risk of premature mortality from lung cancer as well as cancers of other organs and a variety of nonneoplastic diseases.[33]

THE CANCER-RELATED CHECKUP

Periodic encounters with clinicians for checkups offer the potential for health counseling, cancer screening, and case finding.[29] 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.

The ACS now recommends that the cancer-related checkup occur on the occasion of a general periodic health examination rather than as a stand-alone examination done at a specific interval based on an individual's age (Table 1).

In the July/August issue of this journal,[34] as well as *Circulation*,[35] *Stroke*,[36] and *Diabetes Care*,[37] the ACS, the American Heart Association, and the American Diabetes Association announced a new collaboration to address a common preventive health agenda. The goal of this joint venture is to stimulate substantial improvements in primary prevention and early detection through collaboration between key organizations, greater public awareness about healthy lifestyles, legislative action that results in more funding for and access to primary prevention programs and research, and reconsideration of the concept of the periodic medical checkup as an effective platform for prevention, early detection, and treatment. The idea of reconsidering the periodic checkup will appear to many to neglect the current belief that there is little evidence to support the value of checkups.[38] However, the evidence is clear that a preventive health model that emphasizes finding opportunities for preventive health during encounters for acute and chronic illness is inherently limited.[39] Furthermore, if traditional checkups were largely unproductive, it is reasonable to consider that there may be alternatives for dedicated preventive health encounters that would include testing and counseling (based on age/gender/risk) that would contribute to greater progress toward preventive health goals.[40]

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

Data Sources and Methods

This section presents surveillance data on the estimated proportion (prevalence) of the adult population that undergoes specific tests for early cancer detection in the United States in accordance to ACS cancer screening guidelines (see Table 2). Table 2 also shows the variation in cancer screening prevalence by health insurance coverage among individuals less than 65 years old and those 65 years old and over. The source of the data is the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS) survey conducted in 2002; this is the most recent survey year that included a comprehensive set of questions to assess prevalence of cancer screening for breast, cervical, colorectal, and prostate cancer. The BRFSS provides state-specific estimates of behavioral risk

TABLE **2**   Prevalence* (%) of Recent Cancer Screening Examinations Among US Adults by Health Insurance Coverage, BRFSS 2002

	US Adults		Non-elderly (under 65 years of age)				Age 65 and over	
	Overall	95% CI	Have Health Insurance	95% CI	No Health Insurance	95% CI	Have Health Insurance	95% CI
Colorectal cancer (adults 50 and older)								
Either a flexible sigmoidoscopy or colonoscopy†	41.0	(40.4–41.6)	37.3	(36.4–38.0)	18.6	(16.8–20.4)	48.1	(47.3–48.9)
Fecal occult blood testing (home kit)‡	22.0	(21.6–22.4)	20.3	(19.7–20.9)	9.1	(8.0–10.2)	25.6	(24.9–26.3)
Breast cancer (women 40 and older)								
Mammogram§	61.3	(60.7–61.9)	64.0	(63.2–64.7)	36.6	(34.5–38.7)	63.7	(62.7–64.7)
Mammogram and clinical breast exam¶	54.0	(53.4–54.6)	58.4	(57.6–59.1)	31.4	(29.5–33.4)	52.1	(51.0–53.2)
Cervical cancer (women 18 and older)								
Pap test**	88.2	(87.8–88.6)	90.3	(89.9–90.8)	75.6	(75.0–77.9)	74.4	(73.2–75.5)
Prostate cancer (men 50 and older)								
Prostate-specific antigen††	54.8	(53.8–55.8)	51.8	(50.5–53.1)	28.2	(25.0–31.8)	61.9	(60.5–63.3)
Digital rectal exam‡‡	52.7	(51.7–53.7)	51.9	(50.6–53.2)	26.4	(23.2–29.6)	57.7	(56.2–59.1)

*Prevalence is weighted and age adjusted using the 2000 Census.
†Recent sigmoidoscopy or colonoscopy test within the preceding five years.
‡Recent fecal occult blood test using a home kit test performed within the preceding year.
§Women 40 and older who had a mammogram in the last year.
¶Women 40 and older who had a mammogram in the last year and a clinical breast exam.
**Women who had a Pap test within the preceding three years.
††A prostate-specific antigen test (PSA) within the past year for men who have not been told they have had prostate cancer.
‡‡A digital rectal examination (DRE) within the past year for men who have not been told they have had prostate cancer.
Source: Behavioral Risk Factor Surveillance System 2002.

factors from ongoing statewide telephone surveys of the civilian, noninstitutionalized adult populations (ie, persons 18 years of age or older living in households with a telephone). State health departments, in collaboration with the Centers for Disease Control and Prevention, in each of the 50 states, the District of Columbia, and Puerto Rico, conduct the BRFSS annually. 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 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.[41] A specialized statistical software for the analysis of survey was used to compute the age-adjusted weighted prevalence estimates and standard error of the estimates for the United States based on the combined state-level weighted data of states participating in the BRFSS in 2002.[42] To highlight the impact of health insurance as a determinant of the use of early cancer detection tests for breast, cervical, colorectal, and prostate cancers, health insurance status for persons less than 65 years of age was classified on whether they had or did not have any kind of health care coverage.

Colorectal Cancer Screening

The prevalence of colorectal cancer examinations (the BRFSS can not distinguish whether endoscopy was done for screening or diagnostic purposes) with an endoscopy procedure was

nearly twice the prevalence of screening with an FOBT in both men and women. In 2002, among adults 50 years and older, the prevalence of having had an endoscopy procedure within the past 5 years for colorectal cancer was 41%, and the prevalence of having a take-home FOBT (ie, not an in-office, single-panel FOBT) within the past year was 22%. Compared with individuals who have health care coverage, the uninsured nonelderly group was significantly less likely to have had a recent colorectal cancer screening test; only 18.6% had an endoscopy procedure and only 9.1% had a home-test fecal occult blood examination (Table 2).

Breast Cancer Screening

In 2002, the proportion of women aged 40 and older who reported having had a mammogram in the last year was 61.3%, while fewer women (54%) reported having had both a mammogram and a CBE in the last year. Compared with women who have health care coverage, uninsured women aged 40 to 64 years were less likely to have had a mammogram (36.6%) or both a mammogram and a CBE (31.4%) in the previous year (Table 2).

Cervical Cancer Screening

In 2002, 88.2% of women aged 18 and older with an intact uterus reported having had a Pap test in the preceding 3 years. While approximately 9 in 10 women 18 to 64 years of age with health insurance report having had a recent Pap test, only slightly fewer women without health insurance (75.5%) also report having recently been screened for cervical cancer, suggesting widespread access to testing through governmental and privately supported programs (Table 2). The BRFSS asks this question of women aged 18 and older because previous guidelines recommended that women begin screening after the onset of sexual activity, or age 18, whichever came first.[1]

Testing for Early Prostate Cancer Detection

In 2002, among men aged 50 and older without a prior diagnosis of prostate cancer, the prevalence of reported PSA testing in the past year was 54.8%, and the prevalence of having had a DRE was 52.7%. Among men aged 50 to 64, those 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 group who had health care coverage (Table 2).

Skin Examination by a Provider

Saraiya and colleagues[43] analyzed skin cancer screening data from a national representative sample of US adults collected by the National Center for Health Statistics in 2000 and reported that among adults aged 18 and older, 14.5% reported having ever had a skin cancer screening examination by a doctor. Of these, only 8.0% reported having had a recent examination for skin cancer performed by a provider. Uninsured adults were significantly less likely to have a recent skin examination compared with insured adults (3.5% versus 9.1%).

DETERMINANTS OF HEALTH CARE ACCESS AND ADHERENCE WITH RECOMMENDED CANCER SCREENING IN WOMEN AND MEN

In addition to health insurance coverage information, the BRFSS 2002 also collected information on two important determinants of access to health care: having a regular doctor and a usual source of care. In this section, the pattern of adherence with recommended cancer screening is described in the context of these two factors that influence access to health care. Assessing the extent of adherence with all recommended cancer screening (specifically, breast and cervical cancer screening for women and colorectal cancer screening for women and men) and health care access factors associated with adherence can provide useful information for cancer control research and planning. In this analysis, we also measure the prevalence of testing for early prostate cancer detection in men. Although it would be preferable to measure the national prevalence of having undergone a process of informed decision making about prostate cancer testing consistent with current recommendations, it is not possible be-

cause data documenting this process are not available at this time.

Understanding the relationship between the determinants of health care access and the use of early detection cancer tests is a critical element in the larger framework of access to the continuum of quality of cancer care.[44,45] In these analyses, the measure of access to health care was categorized into three mutually exclusive groups based on responses to the following two questions in the BRFSS 2002 survey: "Do you have one person you think of as your personal doctor, nurse, or health care provider?" and "When you are sick or need advice about your health, to which one of the following places do you usually go?" Respondents reporting that they go to a doctor's office, a public health clinic or community health center, or a hospital outpatient clinic were considered to have a usual source of care, while those reporting going to an emergency facility or not having a place for medical care were considered not to have a usual source of care. Individuals in group 1 were those who have both a regular doctor and/or a usual source of care; individuals in group 2 had only a usual source of care but not a regular provider; and individuals in group 3 had neither a usual source of care nor a regular provider. Based on this classification, individuals in group 1 are assumed to have the most access to health care when compared with those in groups 2 and 3, and they also uniquely benefit from having a consistent patient-provider relationship.

Measures of cancer screening adherence for women aged 50 and older were based on being adherent to the following screenings: having had a mammogram in the past year, having had a Pap test within the past 3 years, and having either or both a home fecal occult test in the past year or a sigmoidoscopy/colonoscopy in the past 5 years. In men aged 50 and older, the measure of cancer screening adherence considers whether they were adherent with ACS guidelines for colorectal cancer screening and also whether they were tested for early prostate cancer detection. Finally, to assess the independent effect of the determinants of health care access (having a regular doctor and a usual source of care) on adherence to cancer screen-

ing, multivariate analyses were conducted to control for key confounders, in particular, having health insurance coverage.

Overall Cancer Screening Adherence

Among adult women aged 50 years and older, 34% were adherent with all the early detection tests for breast, cervical, and colorectal cancer screening; 25% were adherent with breast and cervical cancer screening; and 41% were not adherent with any of these screening recommendations. Among adult men aged 50 years and older, 9% were only adherent with colorectal cancer screening, 41% reported colorectal cancer screening and PSA testing, 23% reported PSA testing only, and 27% reported having not undergone any screening for colorectal cancer or PSA testing for early prostate cancer detection.

Figure 1[41] displays a graphical presentation of the relationship between health care access determinants (having a regular provider and having a usual source of care) and adherence to cancer screening among women and men aged 50 and older. As these figures show, the lowest prevalence of being adherent to cancer screening recommendations in men and women was among those without a regular doctor and a usual source of care (ie, group 3). These figures also show that the relationship between health care access and adherence to cancer screening is similar in women and men aged 50 and older. In other words, the prevalence of being adherent with all gender-specific cancer screening recommendations decreases as barriers to health care access increase (ie, lacking a personal physician or regular source of health care) and vice versa.

The results in this section indicate that health care access factors (ie, health insurance coverage, having a regular provider and a usual source of care) have an effect on the prevalence of recent use of cancer screening and the prevalence of adherence to recommended cancer screening for breast, cervical, and colorectal cancer and testing for early prostate cancer detection. These results are consistent with other studies of the determinants of health care access on the use of
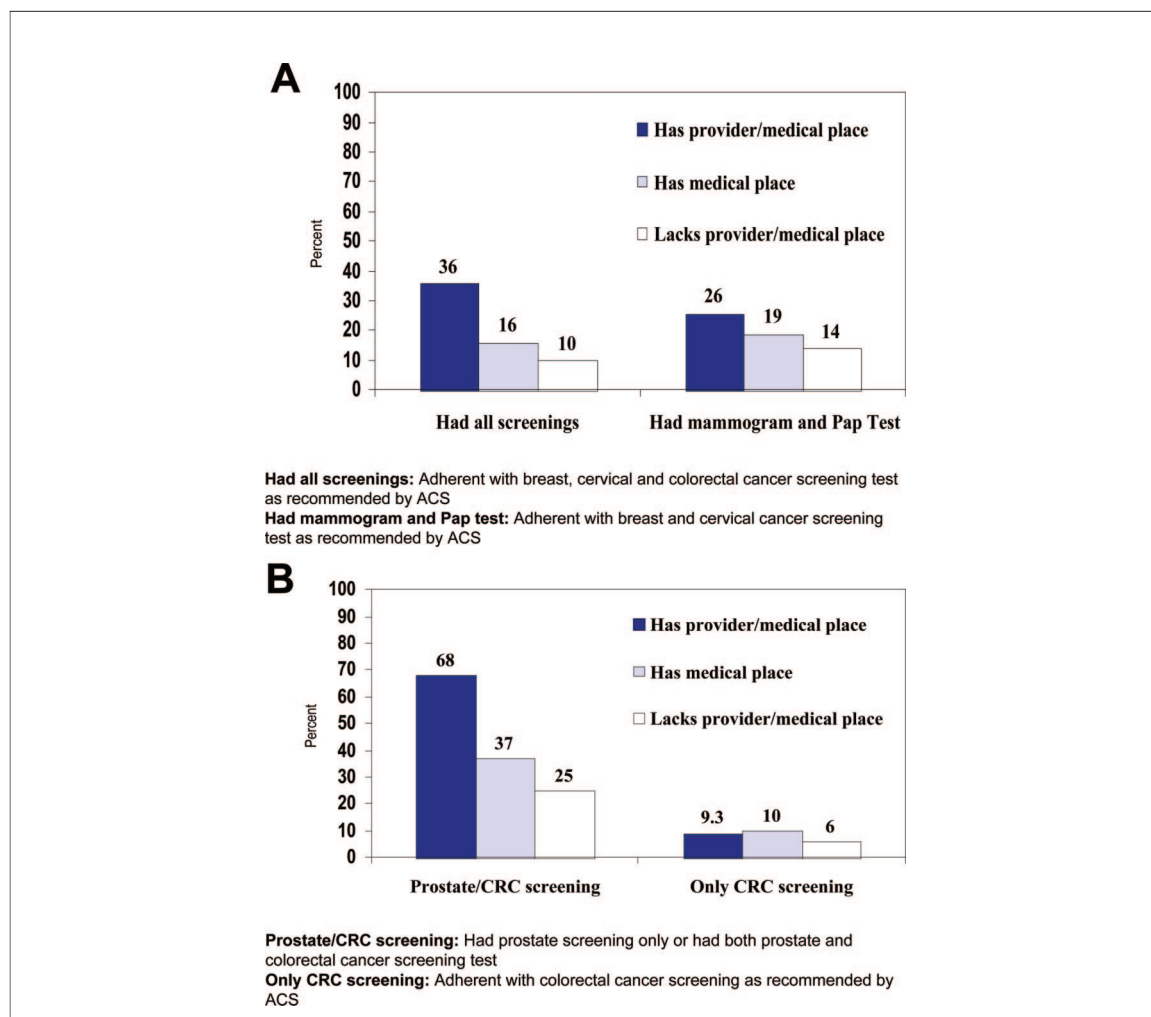
FIGURE **1 A,** Adherence with Cancer Screening for Breast, Cervical, and Colorectal Cancer in Women Aged 50 and Older by Health Care Access. **B,** Adherence with Cancer Screening for Prostate and Colorectal Cancer in Men Aged 50 and Older by Health Care Access.
"Has provider/medical place" indicates the individual has a regular doctor or both a regular doctor and a usual source of medical care place. "Has medical place" indicates the individual has only a usual source of medical care place and no regular doctor. "Lacks provider/medical place" indicates the respondent reported having neither a regular doctor nor a usual source of medical care place.
Source: Behaviorial risk factor surveillance system, 2002. Surveillance Research. Atlanta, GA: American Cancer Society, 2002.

preventive care services, including the use of cancer screening services.[44,46–55] Based on 2002 US Census statistics of health insurance coverage, 17% of Americans under 65 years of age were uninsured; in contrast, less than 1% of the elderly population (those 65 years and older) were uninsured.[56] More than 40 million Americans do not have a particular doctor's office, clinic, health center, or other place where they usually go to seek health care or health-related advice. Even among privately insured persons, a significant num-

ber lacked a usual source of care or reported difficulty in accessing needed care because of financial constraints or insurance problems.[57]

These findings have implications for the assessment of quality of cancer care and cancer control because research shows that determinants of health care access are associated with a diagnosis of late-stage cancer.[58,59] Policy measures and interventions to diminish disparities in health care access are needed in order to improve access to screening for cancer in the population.[60]

CONCLUSIONS

There are some themes that remain constant in this review from year to year. While overall progress in cancer screening rates is evident in each successive year, progress is more evident in some cancers and less so in others. More glaring is the persistent disparity in cancer screening and, by extension, stage at diagnosis, incidence, and mortality rates among those with access to care compared with those without access.[58] The lack of organized screening means that a significant proportion of the adult population does not receive screening at all or does not receive regular screening. For some individuals who otherwise would get regular screening, the lack of population registers and reminder systems contributes to the uninterrupted progression from detectable early-stage disease to advanced disease.[61] Although some health plans and government programs have reminder systems, most adults must rely on their own calendar and awareness of when they are due for their next examination, or encounters with a health care provider who may or may not be attentive to the importance of regular screening and their patient's screening history. Opportunities for primary prevention also are limited by the nature of health care delivery in the United States.[62]

The collaboration among the ACS, the American Diabetes Association, and the American Heart Association holds the potential to achieve greater progress in health promotion and disease prevention by simplifying messages about health, promoting a set of easily understood core recommendations that could reduce individual risk for each of these diseases, and attempting to identify a cost-effective strategy of periodic preventive health encounters between individuals and health care professionals. These recommendations could be a unifying force for action and advocacy for individuals, families, clinicians, communities, and organizations. A new, simplified, and integrated set of recommendations for preventive health likely would be embraced by clinicians and would provide a new opportunity for clinicians to focus on important risk factors that, if avoided or modified, could have beneficial effects for reducing incidence and premature mortality for the leading chronic conditions. Furthermore, periodic visits dedicated to preventive health and paid for by health plans would provide for the most influential approach to preventive health that has been observed to date—advice, encouragement, and support of an individual's health care provider.

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