

# Cancer Screening in the Older Patient

ROSS H. ALBERT, MD, PhD, and MATHEW M. CLARK, MD, MA

Abington Memorial Hospital, Abington, Pennsylvania

Although there are clear guidelines that advise at what age to begin screening for various cancers, there is less guidance concerning when it may be appropriate to stop screening. The decision to stop screening must take into account patients' age; overall health and life expectancy; the natural history of the disease; and the risks, expense, and convenience of the screening test, and any subsequent testing and treatment. The U.S. Preventive Services Task Force and the American Academy of Family Physicians suggest that Pap-nicolaou smears can be discontinued in women at 65 years of age, provided they have had adequate recent normal screenings. Evidence suggests that cessation of breast cancer screening at approximately 75 to 80 years of age is appropriate, although American Geriatric Society guidelines recommend cessation at a more advanced age. Studies support continuing colon cancer screening until approximately 75 years of age in men and 80 years of age in women for patients without significant comorbidities. Prostate cancer screening, if conducted at all, may be discontinued at approximately 75 years of age in otherwise healthy men. Ultimately, the decision to screen or to discontinue screening must be made after careful discussion with each patient, using evidence-based guidelines and individual patient preferences. (Am Fam Physician 2008;78(12):1369-1374, 1376. Copyright © 2008 American Academy of Family Physicians.)

► See related editorial on page 1336.

► Patient information: A handout on cancer screening, written by the authors of this article, is provided on page 1376.

**O**ne of the fundamental goals of primary care medicine is the prevention or early detection of disease through screening. Screening can lead to interventions that may decrease morbidity and mortality, but it can also lead to increased morbidity and mortality if performed inappropriately. Evidence-based and consensus guidelines have been released by various government and specialty organizations regarding cancer screening. These guidelines generally recommend at what age to initiate screening and how often to screen, but do not always specify when screening should stop. The following is a review of guidelines and data regarding the cessation of cancer screening in older patients, and suggestions for how to incorporate these guidelines into daily practice.

## A Framework for Decision Making

There are currently more than 30 million Americans older than 65 years. This number is expected to increase to more than

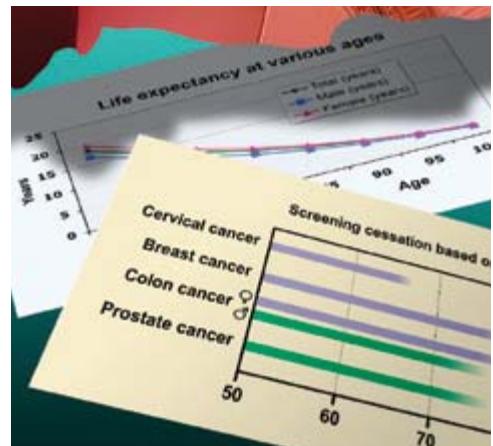


ILLUSTRATION BY JOHN W. KARAPETOU

70 million by the year 2030.<sup>1</sup> Life expectancy continues to rise, with an average life expectancy at birth of 75 years for men and 80 years for women (Table 1).<sup>2</sup> Life expectancies of patients diagnosed with selected comorbid diseases are shown in Table 2.<sup>3-6</sup>

**Table 1. Life Expectancy at Various Ages**

Age (years)	Total (years)	Men (years)	Women (years)
Birth	77.4	74.7	80.0
65	18.4	16.8	19.7
70	14.8	13.4	15.9
75	11.7	10.5	12.5
80	8.9	7.9	9.5
85	6.6	5.9	7.0
90	4.8	4.3	5.0
95	3.5	3.1	3.5
100	2.5	2.2	2.5

Information from reference 2.

**SORT: KEY RECOMMENDATIONS FOR PRACTICE**

Clinical recommendation	Evidence rating	References
Cervical cancer screening may be stopped at 65 years of age, if the patient has a history of normal screening.	C	10-13, 21, 22
Breast cancer screening may be stopped at approximately 75 to 80 years of age for a woman at average risk and with average overall health status.	B	14-16, 26, 27
Colon cancer screening may be stopped at approximately 75 years of age for men and 80 years of age for women, with life expectancy and comorbidities considered in the decision.	B	7, 17, 28
Prostate cancer screening, if conducted at all, may be stopped at approximately 75 years of age, or when life expectancy is less than 10 years.	C	18-20, 29, 30

*A = consistent, good-quality patient-oriented evidence; B = inconsistent or limited-quality patient-oriented evidence; C = consensus, disease-oriented evidence, usual practice, expert opinion, or case series. For information about the SORT evidence rating system, go to <http://www.aafp.org/afpsort.xml>.*

and patients' risk of dying of specific cancers is shown in *Table 3*.<sup>7</sup>

A framework for decision making about cancer screening should be built on available evidence-based medicine guidelines, patients' risk of dying (estimated by life expectancy and comorbidities), the benefits

and harms of screening, and patients' preferences and values. Patients may vary greatly in their overall health expectations and preferences of what screening they want to have performed.<sup>7,8</sup> The risks of screening include complications from additional testing or from treatment of clinically insignificant cancers, as well as psychological complications from the distress of screening and its possible implications.

There are a few key elements that comprise an effective medical screening test: the target disease should be common and should cause significant mortality and morbidity; the test should be accurate as well as reasonably tolerable; a positive result should allow for beneficial intervention during the asymptomatic phase of the disease; and the test and the cure should be cost-effective.<sup>9</sup> The relative importance of these key points shifts when comparing patients of different ages. For example, cancer is more common in older patients than in younger ones, so screening may be more likely to detect true malignancies in older patients. Additionally, screening tolerability may decrease with age, such as with Papanicolaou (Pap) smears, which may be significantly less comfortable in older patients because of vaginal atrophy and osteoarthritis of the hips. Finally, the cost effectiveness of the screening and the ability to benefit from early interventions can change based on a patient's age.

**Table 2. Average Life Expectancy After Diagnosis of Selected Diseases**

Disease	Age	Life expectancy
Alzheimer disease	Not specified	Men: 4.2 years Women: 5.7 years
Hip fracture	80 years	5.4 years
Congestive heart failure	> 75 years	Men: 3.9 years Women: 4.5 years
Myocardial infarction	Not specified	11.3 years

*Information from references 3 through 6.*

**Table 3. Risk (Percentage) of Dying of Cancer in Remaining Lifetime for Patients at Average Risk**

Type of cancer	Age (years)					
	50	70	75	80	85	90
Breast	3.1	2.2	1.8	1.5	1.2	0.8
Colorectal (men)	2.3	2.1	1.9	1.8	1.6	1.1
Colorectal (women)	2.2	2.0	1.9	1.8	1.6	1.0
Cervical	0.26	0.15	0.12	0.10	0.07	0.05

*Adapted with permission from Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. JAMA. 2001;285(21):2752.*

### Cervical Cancer Screening

The mainstay of cervical cancer screening is the Pap smear. *Table 4*<sup>10-20</sup> lists the guidelines for cervical cancer screening in older persons

from the American Academy of Family Physicians (AAFP), the U.S. Preventive Services Task Force (USPSTF), the American College of Obstetricians and Gynecologists (ACOG), the American Cancer Society (ACS), and the American Geriatrics Society (AGS). The guidelines range from specific recommendations to stop screening at either 65 or 70 years of age to suggested decision-making based on the patient's age and risk factors. However, there is consensus from each organization that Pap smears may be stopped following a hysterectomy for benign indications with removal of all cervical tissue.

Another consistent element across all four guidelines is the requirement that patients have a history of normal results before screenings are stopped. This is based on data showing that women with prior normal screens have a lower risk of future high-grade lesions and cancer. A systematic review of studies from 1995 to 2001 showed that fewer than one in 1,000 women older than 60 years with a normal baseline Pap smear developed high-grade cervical lesions or cervical cancer; however, this risk nearly doubled in women with no prior baseline Pap smears.<sup>21</sup> A retrospective analysis of more than 600,000 women screened over six months showed that more than 80 percent of women with a high-grade lesion or cancer had either abnormal Pap smears or no Pap smears in the past.<sup>22</sup>

Data from one California-based study suggest that the age-based recommendations to stop cervical cancer screening are not being followed universally.<sup>23</sup> The study, which involved a health interview survey of more than 4,500 women older than 70 years, found that the percentage of women being screened did not differ significantly between the healthiest population (i.e., longest life expectancy) and the least healthy (i.e., shortest life expectancy), regardless of age. More than 50 percent of women older than 80 years in the worst health quartile reported that they were still receiving Pap smears.

### Breast Cancer Screening

Breast cancer screening modalities include mammography, clinical breast examination, and breast self-examination. This review

focuses on mammography as a screening tool, because it is the best-validated breast cancer screening. The guidelines regarding the cessation of mammography list age, life expectancy, and health status as key factors (*Table 4*<sup>10-20</sup>). The AAFP does not comment on the use of mammography for women

**Table 4. Guidelines for the Cessation of Cancer Screening**

Organization	Recommended age of cessation
<b>Cervical cancer screening</b>	
AAFP/USPSTF	65 years of age "if they have had adequate recent screening with normal Pap smears and are not otherwise at high risk" <sup>10</sup>
ACOG	Age determined "on an individual basis ... based on such factors as [the patient's] medical history and the physician's ability to monitor the patient in the future" <sup>11</sup>
ACS	70 years of age and "three or more normal Pap tests in a row and no abnormal Pap test results in the past 10 years" <sup>12</sup>
AGS	70 years of age; "There is little evidence for or against screening women [beyond age 70] who have been regularly screened in previous years" <sup>13</sup>
<b>Breast cancer screening</b>	
ACS	"The decision to stop screening should be individualized on the basis of the potential benefits and risks of screening in the context of overall health status and longevity" <sup>14</sup>
AGS	"[Screening may continue in women with] an estimated life expectancy of four or more years" <sup>15</sup>
USPSTF	"Women with comorbid conditions that limit their life expectancy are unlikely to benefit from screening" <sup>16</sup>
<b>Colon cancer screening</b>	
USPSTF	Recommends against routine screening in adults 76 to 85 years of age; recommends against screening in adults older than 85 years <sup>17</sup>
<b>Prostate cancer screening</b>	
AAFP/USPSTF	Recommends against screening for prostate cancer in men 75 years and older <sup>18</sup>
ACS/AUA	Screening for prostate cancer should be offered annually beginning at 50 years of age to men who have a life expectancy of at least 10 years <sup>19,20</sup>

AAFP = American Academy of Family Physicians; ACOG = American College of Obstetricians and Gynecologists; ACS = American Cancer Society; AGS = American Geriatrics Society; AUA = American Urological Association; Pap = Papanicolaou; USPSTF = U.S. Preventive Services Task Force.

Information from references 10 through 20.

older than 69 years, and the ACOG has not issued recommendations on the cessation of mammography.

The AGS includes a four-year life expectancy as a requirement for breast cancer screening. This stems from two large longitudinal studies of women 40 to 74 years of age who were either screened with mammography or not screened. The studies show that screening decreased mortality, though the beneficial effect appeared with a lag time of four to five years after screening.<sup>24,25</sup>

Various studies have assessed the benefits of mammography in women of different ages. A case-control study of women receiving mammography showed decreased mortality in women younger than 75 years, but no survival benefit in women older than 75 years.<sup>26</sup> A 2003 cost analysis from the USPSTF showed that mammography was cost-effective for women up to 80 years of age, but only in healthy patients with the greatest life expectancy.<sup>27</sup>

Another study also stressed the importance of life expectancy on the effectiveness of mammography in older women. In 75-year-old women, the calculated number needed to screen (NNS) to prevent one breast-cancer-specific death was 176 in a group with a 17-year life expectancy, compared with 1,361 in those whose life expectancy was only seven years.<sup>7</sup> This supports the theory that women with longer life expectancies are more likely to benefit from screening with mammography. Therefore, a reasonable recommendation based on these guidelines is to continue mammography until 75 or 80 years of age in healthy women, but to consider earlier cessation in those with significant comorbidities who have a remaining life expectancy of five years or less.

**A case-control study of women receiving mammography showed decreased mortality in women younger than 75 years, but no survival benefit in women older than 75 years.**

although there may be considerations that support screening in individual patients.<sup>17</sup> The USPSTF also recommends against screening in adults older than 85 years.<sup>17</sup> Recommendations from research studies have suggested that discontinuation of colon cancer screening should be based on age, life expectancy, and comorbidities.

One retrospective study compared life expectancy after diagnosis of stage I colon cancer at 67 years of age across a spectrum of health status to better define the benefits of early detection of cancer through screening.<sup>28</sup> Life expectancy of otherwise healthy patients diagnosed with stage I disease was not different from persons without colon cancer. However, in patients with one or more chronic diseases, life expectancy after diagnosis was decreased compared with those without colon cancer, suggesting that early diagnosis through screening is more beneficial in patients with fewer comorbidities.

Another study assessed the NNS to prevent one colon cancer death through screening with FOBT in patients with different life expectancies.<sup>7</sup> While the NNS for 70-year-old patients with 18-year life expectancies was calculated at 177, this number increased more than tenfold to an NNS of 1,877 in 70-year-old patients with a 6.7-year life expectancy. These data again suggest that older patients with the longest life expectancies and the fewest comorbid problems are more likely to benefit from colon cancer screening. With a suggested screening interval of 10 years for colonoscopy, it is reasonable to discuss discontinuing screening when a patient's life expectancy approaches 10 years. This corresponds to approximately 75 years of age for men and 80 years of age for women (*Table 1*<sup>2</sup>).

### Prostate Cancer Screening

Prostate cancer is fundamentally different from the three cancers discussed previously. With subclinical prostate cancer being detected at autopsy in more than 80 percent of men older than 70 years, it is determined that older men typically die with prostate cancer but not from it.<sup>29</sup> Prostate cancer screening is controversial, because most men,

### Colon Cancer Screening

Colon cancer screening modalities include fecal occult blood test (FOBT), barium enema, sigmoidoscopy, and colonoscopy. The USPSTF recommends against routine screening in adults 76 to 85 years of age,

if screened long enough, will test positive. There is continuing debate whether screening increases or decreases morbidity and mortality.<sup>30</sup> Prostate specific antigen (PSA) testing and digital rectal examination are typically used in combination for screening. The AAFP and the USPSTF state that there is insufficient evidence to assess the balance of benefits and harms of screening for prostate cancer in men younger than 75 years.<sup>18</sup> Additionally, the AAFP and USPSTF recommend against prostate cancer screening in men 75 years of age and older (*Table 4*<sup>10-20</sup>).<sup>18</sup> The ACS and the American Urological Association state that screening may be stopped in men with a life expectancy of less than 10 years,<sup>19,20</sup> which corresponds to 75 years of age for an average man (*Table 1*<sup>2</sup>).

Studies evaluating the mortality benefit of prostate cancer treatment have also yielded varying results.<sup>30-32</sup> Despite conflicting evidence regarding the benefit of screening and treatment, one recent cohort study showed that more than 30 percent of men older than 85 years were still being screened for prostate cancer.<sup>33</sup> In an attempt to better define higher risk elderly patients for screening, one study attempted to stratify prostate cancer risk based on PSA values found at 65 years of age.<sup>34</sup> This study, from the Baltimore Longitudinal Study of Aging, showed that 94 percent of men who had a PSA of less than 1.0 at 65 years of age, and 100 percent of men with a PSA of less than 0.5 at 65 years of age remained cancer free (based on PSA values) at 10-year follow-up.<sup>34</sup> This suggests that fewer men might be screened at older ages if men with low PSA values at 65 years of age were excluded from future screening.

### Incorporation into Daily Practice

These data are provided as guides for physicians' decision making. The discussion with older patients and their families regarding screening can be even more complicated than the interpretation of the data and guidelines. It is imperative to carefully explain that cessation of screening is typically done to prevent harm, and not simply to ignore problems. While some patients

may respond with relief at the thought of not undergoing further testing, others may feel discriminated against because of perceived ageism from their physician and the medical community. It is essential that a careful two-way dialogue, based on evidence-based guidelines and individual patient preferences, guide the decision to continue or to stop cancer screening.

### The Authors

ROSS H. ALBERT, MD, PhD, is the assistant director of the Family Medicine Residency Program at Abington Memorial Hospital in Abington, Pa. He received his medical degree and doctorate of microbiology and immunology at the Drexel University College of Medicine in Philadelphia, Pa., and completed his family medicine residency at Abington Memorial Hospital.

MATHEW M. CLARK, MD, MA, is the associate director of the Family Medicine Residency Program at Abington Memorial Hospital. He received his medical degree at the Yale University School of Medicine in New Haven, Conn., and completed his family medicine residency at Kaiser Foundation Hospital in Los Angeles, Calif.

*Address correspondence to Ross H. Albert, MD, PhD, 500 Old York Rd., Suite 108, Jenkintown, PA 19046 (e-mail: ralbert@amh.org). Reprints are not available from the authors.*

Author disclosure: Nothing to disclose.

### REFERENCES

1. He W, Sengupta M, Velkoff VA, DeBarros KA. 65+ in the United States: 2005. Current population reports: special studies. Washington, DC: U.S. Census Bureau (P23-209), U.S. Government Printing Office; 2005. <http://www.census.gov/prod/2006pubs/p23-209.pdf>. Accessed May 27, 2008.
2. Arias E. United States life tables, 2003. *Natl Vital Stat Rep*. 2006;54(14):1-40.
3. Owen A. Life expectancy of elderly and very elderly patients with chronic heart failure. *Am Heart J*. 2006;151(6):1322.e1-4.
4. Mark DB, Hlatky MA, Califf RM, et al. Cost effectiveness of thrombolytic therapy with tissue plasminogen activator as compared with streptokinase for acute myocardial infarction [published correction appears in *N Engl J Med*. 1995;333(4):267]. *N Engl J Med*. 1995;332(21):1418-1424.
5. Braithwaite RS, Col NF, Wong JB. Estimating hip fracture morbidity, mortality and costs. *J Am Geriatr Soc*. 2003;51(3):364-370.
6. Larson EB, Shadlen MF, Wang L, et al. Survival after initial diagnosis of Alzheimer disease. *Ann Intern Med*. 2004;140(7):501-509.
7. Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. *JAMA*. 2001;285(21):2750-2756.

8. Flaherty JH, Morley JE, Murphy DJ, Wasserman MR. The development of outpatient Clinical Glidepaths. *J Am Geriatr Soc.* 2002;50(11):1886-1901.
9. Wilson JM, Jungner YG. Principles and practice of mass screening for disease [in Spanish]. *Bol Oficina Sanit Panam.* 1968;65(4):281-393.
10. U.S. Preventive Services Task Force. Screening for cervical cancer. <http://www.ahrq.gov/clinic/uspstf/uspccerv.htm>. Accessed May 27, 2008.
11. ACOG Committee on Practice Bulletins. ACOG Practice Bulletin: clinical management guidelines for obstetrician-gynecologists. Number 45, August 2003. Cervical cytology screening (replaces committee opinion 152, March 1995). *Obstet Gynecol.* 2003;102(2):417-427.
12. Saslow D, Runowicz CD, Solomon D, et al. American Cancer Society guideline for the early detection of cervical neoplasia and cancer. *CA Cancer J Clin.* 2002;52(6):342-362.
13. American Geriatrics Society. AGS position statement: screening for cervical carcinoma in older women. [http://www.americangeriatrics.org/products/position-papers/cer\\_carc\\_2000.shtml](http://www.americangeriatrics.org/products/position-papers/cer_carc_2000.shtml). Accessed May 27, 2008.
14. Eyre H, Kahn R, Robertson RM. Preventing cancer, cardiovascular disease, and diabetes: a common agenda for the American Cancer Society, the American Diabetes Association, and the American Heart Association. *CA Cancer J Clin.* 2004;54(4):190-207.
15. Breast cancer screening in older women. American Geriatrics Society Clinical Practice Committee. *J Am Geriatr Soc.* 2000;48(7):842-844.
16. U.S. Preventive Services Task Force. Screening for breast cancer: recommendations and rationale. *Ann Intern Med.* 2002;137(5 part 1):344-346.
17. U.S. Preventive Services Task Force. Screening for colorectal cancer: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med.* 2008;149(9):627-637.
18. U.S. Preventive Services Task Force. Screening for prostate cancer: recommendation statement. *Ann Intern Med.* 2008;149(3):185-191.
19. Smith RA, von Eschenbach AC, Wender R, et al., for the ACS Prostate Cancer Advisory Committee, ACS Colorectal Cancer Advisory Committee, ACS Endometrial Cancer Advisory Committee. American Cancer Society guidelines for the early detection of cancer: update of early detection guidelines for prostate, colorectal, and endometrial cancers. Also: update 2001—testing for early lung cancer detection [Published correction appears in *CA Cancer J Clin.* 2001;51(3):150]. *CA Cancer J Clin.* 2001;51(1):38-75.
20. Prostate-specific antigen (PSA) best practice policy. American Urological Association (AUA). *Oncology (Wilistion Park).* 2000;14(2):267-272, 277-278, 280.
21. Agency for Healthcare Research and Quality. Screening for cervical cancer: systematic evidence review. Rockville, Md.: U.S. Dept. of Health and Human Services; 2002. No. 25. <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat3.chapter.4180>. Accessed May 27, 2008.
22. Wright TC Jr, Cox JT, Massad LS, Twiggs LB, Wilkinson EJ, for the ASCCP-Sponsored Consensus Conference. 2001 Consensus Guidelines for the management of women with cervical cytological abnormalities. *JAMA.* 2002;287(16):2120-2129.
23. Walter LC, Lindquist K, Covinsky KE. Relationship between health status and use of screening mammography and Papanicolaou smears among women older than 70 years of age. *Ann Intern Med.* 2004;140(9):681-688.
24. Nyström L, Andersson I, Bjurstrom N, Frisell J, Nordenskjöld B, Rutqvist LE. Long-term effects of mammography screening: updated overview of the Swedish randomised trials [published correction appears in *Lancet.* 2002;360(9334):724]. *Lancet.* 2002;359(9310):909-919.
25. Collette HJ, de Waard F, Rombach JJ, Collette C, Day NE. Further evidence of benefits of a (non-randomised) breast cancer screening programme: the DOM project. *J Epidemiol Community Health.* 1992;46(4):382-386.
26. van Dijck JA, Verbeek AL, Beex LV, et al. Mammographic screening after the age of 65 years: evidence for a reduction in breast cancer mortality. *Int J Cancer.* 1996;66(6):727-731.
27. Mandelblatt J, Saha S, Teutsch S, et al., for the Cost Work Group of the U.S. Preventive Services Task Force. The cost-effectiveness of screening mammography beyond age 65 years: a systematic review for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2003;139(10):835-842.
28. Gross CP, McAvay GJ, Krumholz HM, Paltiel AD, Bhasin D, Tinetti ME. The effect of age and chronic illness on life expectancy after a diagnosis of colorectal cancer: implications for screening. *Ann Intern Med.* 2006;145(9):646-653.
29. Breslow N, Chan CW, Dhom G, et al. Latent carcinoma of prostate at autopsy in seven areas. The International Agency for Research on Cancer, Lyons, France. *Int J Cancer.* 1977;20(5):680-688.
30. Fleming C, Wasson JH, Albertsen PC, Barry MJ, Wennberg JE. A decision analysis of alternative treatment strategies for clinically localized prostate cancer. Prostate Patient Outcomes Research Team. *JAMA.* 1993;269(20):2650-2658.
31. Wong YN, Mitra N, Hudes G, et al. Survival associated with treatment vs observation of localized prostate cancer in elderly men [published correction appears in *JAMA.* 2007;297(1):42]. *JAMA.* 2006;296(22):2683-2693.
32. Albertsen PC, Hanley JA, Fine J. 20-year outcomes following conservative management of clinically localized prostate cancer. *JAMA.* 2005;293(17):2095-2101.
33. Walter LC, Bertenthal D, Lindquist K, Konety BR. PSA screening among elderly men with limited life expectancies. *JAMA.* 2006;296(19):2336-2342.
34. Carter HB, Landis PK, Metter EJ, Fleisher LA, Pearson JD. Prostate-specific antigen testing of older men. *J Natl Cancer Inst.* 1999;91(20):1733-1737.