RESEARCH LETTER

Physician Attitudes About Using Life Expectancy to Inform Cancer Screening Cessation in Older Adults—Results From a National Survey

Cancer screening's benefits typically lag by many years, whereas the harms occur quickly.[1] Guidelines recommend against routine cancer screening when life expectancy is less than 10 years, but many older adults continue to be screened for common cancers.[2,3] Physicians, however, may disagree with using life expectancy to guide cancer screening cessation. The aim of this study was to examine physicians' attitudes about using life expectancy as a criterion for stopping cancer screening in older adults.

Supplemental content

Methods | Using the American Medical Association Physician Masterfile in this survey study, we mailed surveys (with 2 follow-up mailings) to 1800 primary care physicians in internal medicine, family medicine, general practice, and geriatric medicine about breast, colorectal, or prostate cancer screenings and 600 gynecologists about breast cancer screening in older adults (age ≥65 years) between April and November 2021. A total of 1893 physicians received surveys to our knowledge. The Johns Hopkins School of Medicine Institutional Review Board approved the study, and participants provided informed consent. We followed the AAPOR reporting guideline.

The primary outcome was whether a less than 10-year estimated life expectancy was considered a reasonable criterion for stopping screening. We dichotomized the outcome and examined its association with covariates with the χ^2 test. We included all covariates with $P \leq .05$ in the unadjusted analysis in a multivariable logistic regression model. Additional details are available in the eFigure and eMethods in the Supplement.

Results | Among 991 respondents (response rate 52.4%), 791 were eligible, and 75.3% (n = 596) agreed that life expectancy of less than 10 years was a reasonable criterion for stopping cancer screening, including 81.3% (n = 488 of 600) of primary care physicians and 56.5% (n = 108 of 191) of gynecologists ($P < .001$). In multivariable logistic regression, gynecology specialty (odds ratio [OR], 0.41; 95% CI, 0.24-0.69), older physician age (OR, 0.77; 95% CI, 0.66-0.89 per 10 years), and Black race (OR, 0.41; 95% CI, 0.21-0.79) were associated with lower odds of supporting using life expectancy (**Table**).

A total of 64.4% physicians (n = 509 of 790) agreed that reducing overscreening is part of good patient care, but only 38.8% (n = 300 of 774) perceived overscreening as a substantial problem in older adults (**Figure**, A). Among participants who

Table. Participant Characteristics and Association of Each Characteristic With Primary Outcome

Participant characteristics and distribution within sample	Total participants, No. (%)[a]	Unadjusted comparisons of primary outcome		Adjusted results from multivariable logistic regression
		Participant supported using life expectancy, No. (%)[b]	*P* value[c]	Odds ratio (95% CI)[d]
Age, y (n = 789)				
<40	177 (22.4)	151 (85.3)	<.001	0.77 (0.66-0.89)[e]
40 to <60	380 (48.2)	285 (75.0)		
≥60	232 (29.4)	159 (68.5)		
Sex (n = 790)				
Female	381 (48.2)	284 (74.5)	.63	NA
Male	409 (51.8)	311 (76.0)		
Race (n = 761)				
Asian	136 (17.9)	115 (84.6)	.001	1.60 (0.94-2.72)
Black	47 (6.2)	26 (55.3)		0.41 (0.21-0.79)
White	514 (67.5)	391 (76.1)		1 [Reference]
Other[f]	64 (8.4)	48 (75.0)		0.90 (0.48-1.69)
Geographic region (n = 790)[g]				
Northeast	162 (20.5)	120 (74.1)	.06	NA
Midwest	189 (23.9)	145 (76.7)		
South	254 (32.2)	179 (70.5)		
West	185 (23.4)	151 (81.6)		
Percentage of patients ≥65 y seen by each participant (n = 723)[h]				
≤25%	269 (37.2)	193 (71.7)	.14	NA
26% to 50%	255 (35.3)	196 (76.9)		
≥51%	199 (27.5)	158 (79.4)		

(continued)

Table. Participant Characteristics and Association of Each Characteristic With Primary Outcome (continued)

Participant characteristics and distribution within sample	Total participants, No. (%)[a]	Unadjusted comparisons of primary outcome		Adjusted results from multivariable logistic regression
		Participant supported using life expectancy, No. (%)[b]	*P* value[c]	Odds ratio (95% CI)[d]
No. of hours in clinic per week (n = 738)				
≤20	180 (24.4)	135 (75.0)	.94	NA
21-40	300 (40.7)	224 (74.7)		
≥41	258 (35.0)	196 (76.0)		
Specialty (n = 790)				
Family medicine or general practice	324 (41.0)	267 (82.4)	<.001	1 [Reference]
Internal medicine	261 (33.0)	208 (79.7)		0.77 (0.50-1.20)
Geriatric medicine	15 (1.9)	13 (86.7)		1.16 (0.24-5.40)
Gynecology	191 (24.1)	108 (56.5)		0.41 (0.24-0.69)
Practice type (n = 762)[i]				
Physician-owned practice	257 (33.7)	176 (68.5)	.001	0.76 (0.52-1.12)
Health Maintenance Organization	69 (9.0)	55 (79.7)	.38	NA
Medical school or university	102 (13.4)	84 (82.4)	.08	NA
Nongovernment health system	243 (31.9)	188 (77.4)	.38	NA
Government	60 (7.9)	46 (76.7)	.80	NA
Other[j]	80 (10.5)	61 (76.2)	.85	NA
No. of physicians in participant's practice (n = 761)				
1	109 (14.3)	78 (71.6)	.59	NA
2-10	355 (46.6)	268 (75.5)		
11-49	159 (20.9)	118 (74.2)		
≥50	138 (18.1)	109 (79.0)		
Practice tracks cancer screening rates (n = 774)				
Yes	429 (55.4)	342 (79.7)	.003	1.27 (0.88-1.83)
No	345 (44.6)	243 (70.4)		1 [Reference]
Cancer screening rates affect payment (n = 774)				
Yes	191 (24.7)	145 (75.9)	.90	NA
No	583 (75.3)	440 (75.5)		
Type of cancer screening asked in survey (n = 791)[k]				
Breast	382 (48.3)	258 (67.5)	<.001	1 [Reference]
Colorectal	213 (26.9)	177 (83.1)		1.57 (0.92-2.67)
Prostate	196 (24.8)	161 (82.1)		1.27 (0.75-2.16)

Abbreviation: NA, not applicable.

[a] Eligible physicians cared for older adults and practiced in the outpatient setting. Of the original 991 respondents, 200 were deemed ineligible because they were not providing care to older adults or in outpatient settings or data for the primary outcome were missing (eFigure in the Supplement). Totals in this column do not sum to 791 because of incomplete or missing data.

[b] Numbers and percentages indicate the participants within each row who chose "agree" or "strongly agree" that a less than 10-year life expectancy is a reasonable criterion for stopping routine cancer screening. This primary outcome was measured on a 5-point Likert scale from 1, strongly disagree, to 5, strongly agree, with a higher number indicating stronger agreement.

[c] χ^2 test was used to compare the proportions that supported the use of life expectancy within each category.

[d] Multivariable logistic regression included only variables that were significant ($P < .05$) in unadjusted comparisons; variables included in the final model were age, self-reported race, physician specialty, whether the practice was physician owned, whether the practice tracked cancer screening rates, and the type of cancer screening asked in the survey.

[e] In the multivariable logistic regression, age was entered as a continuous variable, and the reported odds ratio was per each decade of age (ie, for every 10 years older in physician age, the odds ratio of supporting life expectancy was lower at 0.77).

[f] Other includes American Indian or Alaska Native, Asian, and Native Hawaiian or Pacific Islander individuals or those with more than 1 race.

[g] Geographic regions were defined based on the participant's mailing address according to the US Census Bureau 2010 Census Regions and Divisions of the US.

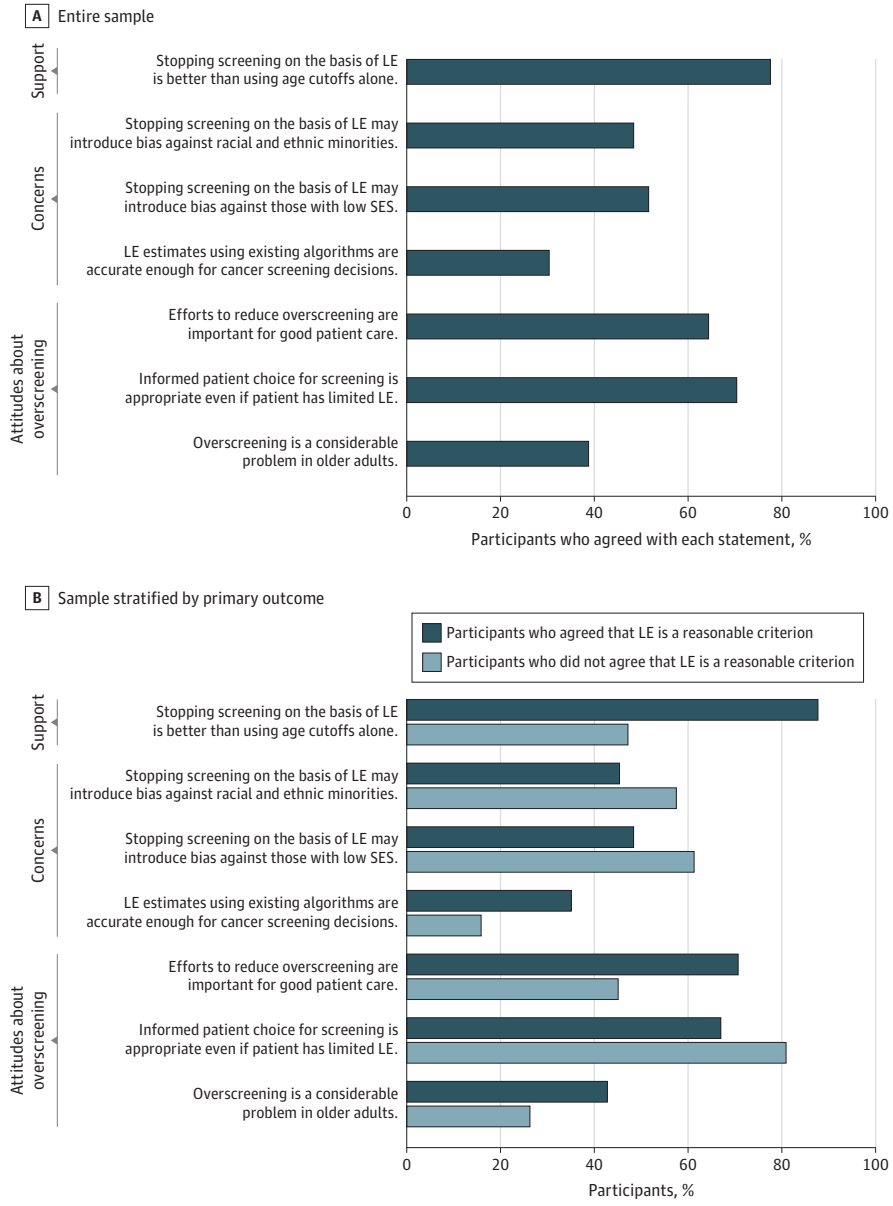
[h] Participants were asked to report what percentage of the patients they treated were older adults (age ≥65 years). For example, geriatricians may see only older adults, so their response would be 100%, whereas primary care physicians may see a smaller percentage of older adults compared with their overall patient population.

[i] Participants could choose more than 1 practice type; therefore, the percentages do not sum to 100%. Unadjusted comparisons were made between those who chose a particular practice type and those who did not choose that practice type regarding their support for life expectancy. In the multivariable logistic regression, each practice type was included in the regression as a separate variable.

[j] This question included a space to write in answers, which included, for example, community hospital, residency program, hospital-based system, and tribal or Indian Health Service–affiliated clinic.

[k] Primary care physicians were randomized to receive 1 of 3 survey versions on breast, colorectal, or prostate cancer screenings. Gynecologists were surveyed only about breast cancer screening.

Figure. Participants' Attitudes Regarding Using Life Expectancy for Screening Cessation and Overscreening in Patients With Limited Life Expectancy



The Figure shows results for the entire sample (A) and stratified by the primary outcome (B), which was whether a less than 10-year life expectancy (LE) was considered to be a reasonable criterion for stopping cancer screening. SES indicates socioeconomic status.

supported life expectancy as a criterion for stopping cancer screening, 45.4% (n = 269 of 593) believed using life expectancy may introduce bias against racial and ethnic minority individuals and 48.4% (n = 287 of 593) believed it may introduce bias against those with low socioeconomic status; only 35.1% (n = 209) of these participants believed that life expectancy prediction algorithms were accurate for making cancer screening decisions (Figure, B).

Discussion | This study found that approximately a quarter of physicians did not consider life expectancy a reasonable criterion for stopping cancer screening in older adults. Together with a study showing that older adults do not perceive life expectancy as relevant in cancer screening,[4] our findings question whether reframing guidelines away from the life expectancy label may be more acceptable to physicians and patients. For example, life expectancy and age-specific cancer mortality have been combined to estimate the risk of dying from that cancer in one's remaining lifetime.[1] Although this calculation fundamentally relies on life expectancy, framing screening cessation as when cancer mortality risk is too low to justify the harms involved may be more acceptable.

The discriminative abilities of life expectancy prediction tools are comparable to other commonly used clinical risk prediction tools.[5,6] Yet few participants felt that these tools were accurate, and many worried about potential bias. Guidelines that recommend using life expectancy need to better evaluate and raise awareness of ways that prediction algorithms may

entrench existing biases, such as against racial and ethnic minority individuals and people of low socioeconomic status.

Only 38.8% of participants perceived overscreening as a substantial problem in older adults. Without such recognition, there is little impetus to reduce overscreening. Limitations of the study include nonresponse bias, social desirability bias, and the cross-sectional design.

Nancy Li Schoenborn, MD, MHS
Cynthia M. Boyd, MD, MPH
Craig Evan Pollack, MD, MHS

Author Affiliations: Division of Geriatric Medicine and Gerontology, Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland (Schoenborn, Boyd); Department of Health Policy and Management, Johns Hopkins University Bloomberg School of Public Health, Baltimore, Maryland (Pollack).

Accepted for Publication: August 5, 2022.

Published Online: October 10, 2022. doi:10.1001/jamainternmed.2022.4316

Corresponding Author: Nancy L. Schoenborn, MD, MHS, Division of Geriatric Medicine and Gerontology, Department of Medicine, Johns Hopkins University School of Medicine, 5200 Eastern Ave, MFL Center Tower, Room 703, Baltimore, MD 21224 (nancyschoenborn@jhmi.edu).

Author Contributions: Dr Schoenborn had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: All authors.
Acquisition, analysis, or interpretation of data: All authors.
Drafting of the manuscript: Schoenborn.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Schoenborn.
Obtained funding: Schoenborn.

Conflict of Interest Disclosures: Dr Schoenborn reported receiving grants from the National Institute on Aging. Dr Boyd reported receiving grants from the National Institute on Aging during the conduct of the study, royalties from UpToDate, and honorarium from DynaMed outside the submitted work. Dr Pollack reported receiving grants from the National Institutes of Health during the conduct of the study, owning stock in Gilead Pharmaceuticals, and working part time as an adviser at the US Department of Housing and Urban Development on issues related to housing and health.

Funding/Support: This project was funded by a career development award (K76AG059984, Dr Schoenborn) from the National Institute on Aging.

Role of the Funder/Sponsor: The funder had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Meeting Presentations: This study was presented as a poster abstract at the American Geriatrics Society 2022 Annual Scientific Meeting; May 12-14, 2022; Orlando, Florida.

Disclaimer: The views expressed in this manuscript do not necessarily represent those of the US Department of Housing and Urban Development.

1. Walter LC, Covinsky KE. Cancer screening in elderly patients: a framework for individualized decision making. *JAMA*. 2001;285(21):2750-2756. doi:10.1001/jama.285.21.2750

2. Wilt TJ, Harris RP, Qaseem A; High Value Care Task Force of the American College of Physicians. Screening for cancer: advice for high-value care from the American College of Physicians. *Ann Intern Med*. 2015;162(10):718-725. doi:10.7326/M14-2326

3. Royce TJ, Hendrix LH, Stokes WA, Allen IM, Chen RC. Cancer screening rates in individuals with different life expectancies. *JAMA Intern Med*. 2014;174(10):1558-1565. doi:10.1001/jamainternmed.2014.3895

4. Schoenborn NL, Lee K, Pollack CE, et al. Older adults' views and communication preferences around cancer screening cessation. *JAMA Intern Med*. 2017;177(8):1121-1128. doi:10.1001/jamainternmed.2017.1778

5. Yourman LC, Lee SJ, Schonberg MA, Widera EW, Smith AK. Prognostic indices for older adults: a systematic review. *JAMA*. 2012;307(2):182-192. doi:10.1001/jama.2011.1966

6. Nanna MG, Peterson ED, Wojdyla D, Navar AM. The accuracy of cardiovascular pooled cohort risk estimates in U.S. older adults. *J Gen Intern Med*. 2020;35(6):1701-1708. doi:10.1007/s11606-019-05361-4