



Cancer Screening Guidelines: A Rapid Review

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Abstract

Cancer is the second leading cause of death worldwide. It has been expected that the burden of cancer has increased due to population growth and aging and lifestyle behaviors. Thus, cancer screening guidelines have developed to prevent mortality and adverse effects of late detection of cancers. In this study, screening guidelines of major cancers have been reviewed and discussed.

Keywords: Cancer; Screening; Mortality

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Introduction

Cancer, as a major public health is the leading cause of death globally.¹⁻³ Unfortunately, the burden of cancer has been expected to increase due to population growth and aging; lifestyle behaviors such as smoking, poor diet, physical inactivity, and reproductive changes in women especially in developing countries. Globally, lung cancer and breast cancer have been known as the leading causes of death in men and women respectively.^{2,3}

To prevent the mortality and burden of cancers, governmental and scientific associations have tried to develop and update cancer guidelines worldwide. In this paper, the guidelines of most important cancers have been briefly reviewed.

Breast Cancer

Breast cancer is the most common cancer of women worldwide. Several guidelines have been developed for breast cancer screening. Mammography is a popular modality for breast screening. The American Cancer Society (ACS) has recommend that mammography must begin annually at the age of 40 years for all women. In addition, Breast Self-Examination (BSE) (regularly (monthly) or irregularly, beginning in their early 20s), and Clinical Breast Examination (CBE) (preferably at least every 3 years for women in their 20s and 30s and preferably annually for asymptomatic women aged ≥ 40 y) have been considered.^{4,5}

The United States Preventive Service Task Force (USPSTF) recommended biennial screening

mammography for women aged 50 to 74 years. Albeit, beginning mammography prior to age 50 years has been considered as an individual option especially for women with a parent, sibling, or child with breast cancer. In addition, the balance of benefits and harms of screening mammography in women aged 75 years or older is not sufficient.^{5,6}

The Canadian Task Force on Preventive Health Care (CTFPHC) recommended routinely screening with mammography every 2 to 3 years for women aged 50–69 and 70–74 years. Although, for women aged 40–49, routinely screening with mammography was not recommended. In addition, BSE and CBE is not recommended routinely.⁷

The American College of Physician (ACP) recommended mammography in women age 40–70 years. Although the benefit of screening in older women is higher. Based on the United Kingdom National Health Service (UK-NHS) guideline, routine screening is not recommended in women age 40–49 years. Albeit, digital mammography is more accurate in women 40–49 years in compare with film mammography. In women aged 50–70 years it has been recommend to perform mammography screening of all women every 3 years.⁸ The American Academy of Family Physicians (AAFP) recommended mammography in women age ≥ 40 years, with or without CBE, every 1–2 years after counseling about its potential risks and benefits.⁸

The National Comprehensive Cancer Network (NCCN) recommended CBE every 1–3 years—breast awareness education in women age 25–40 years with average risk. Albeit, an annual CBE and annual mammogram has been recommended in women age > 40 year. MRI has not been recommended in average-risk patients. In high risk women it has been recommended to perform annual CBE, breast awareness education, and referral to genetic counselor in ages < 25 years. In Aged > 25 years, annual mammogram and MRI, CBE q6–12 months, consider risk-reducing strategies (surgery, chemoprevention) has been recommended.⁸

Cervical Cancer

Cervical cancer is one of the most common female cancers worldwide. The role of Human Papilloma Virus (HPV) is evident in the development of most cervical cancers. Current guidelines recommended screening begins at 21 years. The method of screening is cytology every 3 years for ages 21–65 or cytology every 3 years for ages 21–29 and cytology plus high-risk HPV testing every 5 years. It is not recommended after the age of 65 and screening after hysterectomy with the removal of the cervix screening.^{8–10} Based on UK-NHS, routine screening before the age of 25 is not recommended. Cytology every 3 and 5 years has been recommended for women between 25–49 years and women between 50–64 years respectively. In women age ≥ 65 years, it has been recommended to screen women who have not screened since the age of 50 years or who have had a history of abnormal test results. Albeit, if all the previous screening were negative, the screening ended.⁸

The American College of Obstetrics and Gynecology (ACOG) recommend to begin screening at the age of 21 years independent of the sexual history every 2 years from 21 to 29 years. In women ≥ 30 years, we could screen every 2–3 years if they have three consecutive negative screens, no history of cervical intraepithelial neoplasia 2 or 3, not immunocompromised, no HIV, and not exposed to DES.^{5, 8, 10}

Colorectal Cancer

It has been reported that colorectal cancer is the third most commonly diagnosed cancer in males and the second in females worldwide.^{2, 11–13} Several screening options such as the guaiac-based fecal occult blood test [gFOBT], the immunochemical FOBT [or fecal immunochemical test (FIT)], flexible sigmoidoscopy (FSIG), stool DNA test, computed tomography [CT] colonography [“virtual colonoscopy”] (CTC), double-contrast barium enema (DCBE), and colonoscopy).^{2, 8, 11, 12, 14–17}

As mentioned above, screening begins at the age of 50 years in average-risk adults.^{8, 11} FSIG, DCBE and CTC performs every 5 years while colonoscopy performs every 10 years as gold standard for colon colorectal cancer screening. It has been recommended to perform gFOBT and FIT (iFOBT) annually. Unfortunately, the

interval of stool DNA test is not clearly defined (8, 12). UK-NHS recommended screening with FOBT every 2 years in adults aged between 60–69 years. The Australian guideline has also recommended it but for adults aged between 50–74 years.^{8, 11}

In those at increased risk based on family history but without a definable genetic syndrome, ACS and U.S. Multisociety Task Force on Colorectal Cancer (USMTFCC) recommended screening with colonoscopy at the age of 40 years or 10 years younger than the earliest diagnosis in the immediate family which must be repeated every 5 years. Also, in very-high-risk hereditary non-polyposis colorectal cancer (HNPCC or Lynch syndrome) patients, screening with colonoscopy every 2 years beginning at the age of 20–25 years then yearly at the age of 40 years has been recommended.^{8, 11}

In case of classic Familial Adenomatous Polyposis (FAP), it has been recommended that at-risk children should be offered genetic testing at the ages of 10–12 years. Also, flexible sigmoidoscopy or colonoscopy every 12 months starting at the ages of 10–12 years is recommended. Elective colectomy based on the number and histology of polyps is usually done by the early 20s. In addition, upper endoscopy every 5 years if no gastric or duodenal polyps starting in early 20s has been recommended.^{8, 12}

Prostate Cancer

It has been stated that prostate cancer is the second most frequently diagnosed cancer in men worldwide. The use of PSA testing leads to various incidence rates worldwide.² Although the ACS recommended annual prostate-specific antigen (PSA) and digital rectal exam (DRE) if ≥ 10 -year life expectancy in men age ≥ 50 years, however the USPSTF guideline's recommendation is against PSA-based screening for prostate cancer in asymptomatic men.^{8, 18–21}

Based on the ACP guideline, in men between the ages of 50 and 69 years, PSA testing is not offered unless the patient expresses a clear preference for screening. Also, PSA testing is not offered in average-risk men younger than 50 or 70 years and older or in men with a life expectancy of less than 10–15 years.⁸ The European Association of Urology (EAU) stated that there is a lack of evidence to support or disregard screening with PSA testing for early detection of prostate cancer.^{8, 22, 23}

Based on UK-NHS and NCCN, PSA testing is offered for healthy men between 45–70 years. It has been recommended retesting in 5 years in men at the ages of 45–49 with PSA < 0.7 ng/mL; while in men age 45–49 with PSA > 0.7 ng/mL and those at the ages of 50–59 with PSA > 0.9 ng/mL, retesting is offered every 1–2 years.⁸

Lung Cancer

As mentioned, lung cancer has been known as a leading cause of death in men.^{2, 3, 24} Based on USPSTF and AAFP guidelines, there is no sufficient evidence to recommend for or against lung cancer screening. Also, the American College of Chest Physicians (ACCP) and the American

Society of Clinical Oncology (ASCO) stated that routine screening for lung CA with chest x-ray (CXR) and sputum cytology is not recommended. Albeit, screening with low-dose CT (LDCT) for 3 consecutive years is now recommended for ages 50–74 with a 30-pack-year smoking history and for those who are currently smoking or have quit within the past 15 years without major comorbidities by USPSTF, ACCP, ASCO, ACS and NCCN.^{8,24-26}

Conclusion

While cancer screening guidelines could be important in the reduction of cancer death, early diagnosis and better cancer management. However, it is important to consider their benefits and harms, direct and indirect costs, accessibility, physician's and population's acceptability.

Conflict of Interests

The author declare that they have no conflicts of interest.

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References

1. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2018. *CA Cancer J Clin.* 2018;68(1):7-30. doi: 10.3322/caac.21442. pmid: 29313949.
2. Torre LA, Bray F, Siegel RL, Ferlay J, Lortet-Tieulent J, Jemal A. Global cancer statistics, 2012. *CA Cancer J Clin.* 2015;65(2):87-108. doi: 10.3322/caac.21262. pmid: 25651787.
3. Global Burden of Disease Cancer C, Fitzmaurice C, Dicker D, Pain A, Hamavid H, Moradi-Lakeh M, et al. The Global Burden of Cancer 2013. *JAMA Oncol.* 2015;1(4):505-27. doi: 10.1001/jamaoncol.2015.0735. pmid: 26181261.
4. Smith RA, Manassaram-Baptiste D, Brooks D, Doroshenk M, Fedewa S, Saslow D, et al. Cancer screening in the United States, 2015: a review of current American cancer society guidelines and current issues in cancer screening. *CA Cancer J Clin.* 2015;65(1):30-54. doi: 10.3322/caac.21261. pmid: 25581023.
5. Haas JS, Sprague BL, Klabunde CN, Tosteson AN, Chen JS, Bitton A, et al. Provider Attitudes and Screening Practices Following Changes in Breast and Cervical Cancer Screening Guidelines. *J Gen Intern Med.* 2016;31(1):52-9. doi: 10.1007/s11606-015-3449-5. pmid: 26129780.
6. Siu AL, Force USPST. Screening for Breast Cancer: U.S. Preventive Services Task Force Recommendation Statement. *Ann Intern Med.* 2016;164(4):279-96. doi: 10.7326/M15-2886. pmid: 26757170.
7. Tonelli M, Connor Gorber S, Joffres M, Dickinson J, Singh H, Lewin G, et al. Recommendations on screening for breast cancer in average-risk women aged 40-74 years. *CMAJ.* 2011;183(17):1991-2001. doi: 10.1503/cmaj.110334. pmid: 22106103.
8. Esherrick JS, Clark DS, Slater ED, Gonzales R. Current Practice Guidelines in Primary Care: 2016: McGraw-Hill Medical Publishing Division; 2016.
9. Sawaya GF, Smith-McCune K. Cervical Cancer Screening. *Obstet Gynecol.* 2016;127(3):459-67. doi: 10.1097/AOG.0000000000001136. pmid: 26855089.
10. Fowler CI, Saraiya M, Moskosky SB, Miller JW, Gable J, Mautone-Smith N. Trends in Cervical Cancer Screening in Title X-Funded Health Centers - United States, 2005-2015. *MMWR Morb Mortal Wkly Rep.* 2017;66(37):981-5. doi: 10.15585/mmwr.mm6637a4. pmid: 28934183.
11. Leggett BA, Hewett DG. Colorectal cancer screening. *Intern Med J.* 2015;45(1):6-15. doi: 10.1111/imj.12636. pmid: 25582937.
12. Bray C, Bell LN, Liang H, Collins D, Yale SH. Colorectal Cancer Screening. *WMJ.* 2017;116(1):27-33. pmid: 29099566.
13. Schreuders EH, Ruco A, Rabeneck L, Schoen RE, Sung JJ, Young GP, et al. Colorectal cancer screening: a global overview of existing programmes. *Gut.* 2015;64(10):1637-49. doi: 10.1136/gutjnl-2014-309086. pmid: 26041752.
14. Vernon SW, Murphy CC, McQueen A. Colorectal cancer screening. *Psycho-Oncology.* New York: Oxford University Press; 2015.
15. Imperiale TF, Ransohoff DF, Itzkowitz SH, Levin TR, Lavin P, Lidgard GP, et al. Multitarget stool DNA testing for colorectal-cancer screening. *N Engl J Med.* 2014;370(14):1287-97. doi: 10.1056/NEJMoa1311194. pmid: 24645800.
16. Knudsen AB, Zauber AG, Rutter CM, Naber SK, Doria-Rose VP, Pabiniak C, et al. Estimation of Benefits, Burden, and Harms of Colorectal Cancer Screening Strategies: Modeling Study for the US Preventive Services Task Force. *JAMA.* 2016;315(23):2595-609. doi: 10.1001/jama.2016.6828. pmid: 27305518.
17. Sung JJ, Ng SC, Chan FK, Chiu HM, Kim HS, Matsuda T, et al. An updated Asia Pacific Consensus Recommendations on colorectal cancer screening. *Gut.* 2015;64(1):121-32. doi: 10.1136/gutjnl-2013-306503. pmid: 24647008.
18. Drazer MW, Huo D, Eggener SE. National Prostate Cancer Screening Rates After the 2012 US Preventive Services Task Force Recommendation Discouraging Prostate-Specific Antigen-Based Screening. *J Clin Oncol.* 2015;33(22):2416-23. doi: 10.1200/JCO.2015.61.6532. pmid: 26056181.
19. Catalona WJ. Prostate Cancer Screening. *Med Clin North Am.* 2018;102(2):199-214. doi: 10.1016/j.mcna.2017.11.001. pmid: 29406053.
20. Eastham J. Prostate cancer screening. *Investig Clin Urol.* 2017;58(4):217-9. doi: 10.4111/icu.2017.58.4.217. pmid: 28681029.
21. Bibbins-Domingo K, Grossman DC, Curry SJ. The US Preventive Services Task Force 2017 Draft Recommendation Statement on Screening for Prostate Cancer: An Invitation to Review and Comment. *JAMA.* 2017;317(19):1949-50. doi: 10.1001/jama.2017.4413. pmid: 28397958.
22. Heidenreich A, Bastian PJ, Bellmunt J, Bolla M, Joniau S, van der Kwast T, et al. EAU guidelines on prostate cancer. part 1: screening, diagnosis, and local treatment with curative intent-update 2013. *Eur Urol.* 2014;65(1):124-37. doi: 10.1016/j.eururo.2013.09.046. pmid: 24207135.
23. Mottet N, Bellmunt J, Bolla M, Briers E, Cumberbatch MG, De Santis M, et al. EAU-ESTRO-SIOG Guidelines on Prostate Cancer. Part 1: Screening, Diagnosis, and Local Treatment with Curative Intent. *Eur Urol.* 2017;71(4):618-29. doi: 10.1016/j.eururo.2016.08.003. pmid: 27568654.
24. de Koning HJ, Meza R, Plevritis SK, ten Haaf K, Munshi VN, Jeon J, et al. Benefits and harms of computed tomography lung cancer screening strategies: a comparative modeling study for the U.S. Preventive Services Task Force. *Ann Intern Med.* 2014;160(5):311-20. doi: 10.7326/M13-2316. pmid: 24379002.
25. Tanoue LT, Tanner NT, Gould MK, Silvestri GA. Lung cancer screening. *Am J Respir Crit Care Med.* 2015;191(1):19-33. doi: 10.1164/rccm.201410-1777CI. pmid: 25369325.
26. Infante M, Cavuto S, Lutman FR, Passera E, Chiarenza M, Chiesa G, et al. Long-Term Follow-up Results of the DANTE Trial, a Randomized Study of Lung Cancer Screening with Spiral Computed Tomography. *Am J Respir Crit Care Med.* 2015;191(10):1166-75. doi: 10.1164/rccm.201408-1475OC. pmid: 25760561.