Cancer Care Ontario: Prostate Cancer Screening with the Prostate-Specific Antigen (PSA) Test

Key Messages for Healthcare Providers

Considerations for men at average risk

- Avoid prostate-specific antigen (PSA) testing in men with little to gain:
  - Men 70 years of age and older[1]
  - Men with less than a 10 to 15 year life expectancy[1]
- The Canadian Task Force on Preventive Health Care (CTFPHC) recommends against screening for prostate cancer with the PSA test for men of all ages. However, the greatest benefit from screening appears to be in men aged 55 to 69.[1,2]

References:

1. Carter HB, Albertsen PC, Barry MJ, et al. Early detection of prostate cancer: AUA guideline. American Urological Association Education and Research Inc. 2013.
2. Canadian Task Force on Preventive Health Care, Bell N, Gorber SC, et al. Recommendations on screening for prostate cancer with the prostate-specific antigen test. CMAJ. 2014;186(16):1225-34.

Considerations for men at increased risk

- At least two groups of men have been shown to have an increased risk for prostate cancer:
  - Men with a family history of prostate cancer due to prostate cancer in multiple generations, or one or more first-degree relatives who were diagnosed with prostate cancer(relative risk, 2.53)[1]
  - Black men (relative risk, 1.63)[2]
- There is insufficient published evidence to inform screening recommendations for men at increased risk.
- Some associations such as the Canadian Urological Association (CUA) and American Urological Association (AUA) recommend discussing the value of screening through a shared decision-making process starting at age 40 for men with an increased risk of prostate cancer.[3,4]

References:

1. Zeegers M, Jellema A, Ostrer H, et al. Empiric Risk of Prostate Carcinoma for Relatives of Patients with Prostate Carcinoma. American Cancer Society. 2003; 97(8): 1895-1903.
2. American Cancer Society. Cancer Facts & Figures for African Americans 2013-2014. Atlanta: American Cancer Society, 2013.
3. Carter HB, Albertsen PC, Barry MJ, et al. Early detection of prostate cancer: AUA guideline. American Urological Association Education and Research Inc. 2013.
4. Izawa JI, Klotz L, Siemens DB, et al. Prostate Cancer Screening: Canadian Guidelines 2011. The Canadian Urological Association. 2011.

Considerations for men who have already had a prostate-specific antigen (PSA) test

- Do not continue prostate-specific antigen PSA testing in men with little to gain.
  - Men with a PSA level < 1 ng/mL at age 60[1]
  - Men with a PSA level < 3 ng/mL at age 70[2]
- A prostate cancer risk calculator may help you decide when to refer men for prostate biopsy.
  - Some providers have found the Prostate Cancer Prevention Trial (PCPT) risk calculator helpful, which is available at http://deb.uthscsa.edu/URORiskCalc/Pages/uroriskcalc.jsp.
- Decisions to repeat screening should be made as part of a shared decision-making process involving a discussion between a man and his primary care provider (see position statement for key considerations). If, following that discussion, the man wishes to be re-screened, the United States Preventative Services Task Force suggests lengthening the interval (e.g., 2 – 4 years) between screening tests to reduce harms.[3]

References:

1. Carlsson S, Assel M, Sjoberg D, et al. Influence of blood prostate specific antigen levels at age 60 on benefits and harms of prostate cancer screening: population based cohort study. BMJ 2014; 348: 2296.
2. Carter HB, Albertsen PC, Barry MJ, et al. Early detection of prostate cancer: AUA guideline. American Urological Association Education and Research Inc. 2013.
3. United States Preventative Services Task Force, Moyer VA, et al. Screening for Prostate Cancer: U.S. Preventative Services Task Force Recommendation Statement. Ann Intern Med. 2012; 157: 120-134.

Questions and Answers

About Cancer Care Ontario's recommendations for prostate-specific antigen (PSA) screening

1. What does Cancer Care Ontario recommend for prostate cancer screening?

Randomized controlled trials of prostate cancer screening using the prostate-specific antigen (PSA) test have shown a possible, but small, reduction in prostate-cancer mortality; however, harms associated with screening, including over-diagnosis and over-treatment, are common. Therefore, Cancer Care Ontario does not support an organized, population-based screening program for prostate cancer.

Men who are concerned about their risk of prostate cancer should talk to their primary care provider. Individual decisions to screen should be made as a part of a shared decision-making process involving a discussion between a man and his primary care provider.

2. Why is Cancer Care Ontario making this recommendation?

Randomized controlled trials of prostate cancer screening using the prostate-specific antigen (PSA) test have shown a small reduction in prostate-cancer mortality; however, harms associated with screening are common.

Although a United States study[1] estimates that the rate of incident metastatic prostate cancer was three times higher in the pre-PSA era a net benefit of screening is yet to be proven.

Cancer Care Ontario will continue to monitor emerging evidence on prostate cancer screening.

References:

1. Scosyrev E, Wu G, Mohile S, Messing EM. Prostate-specific antigen screening for prostate cancer and the risk of overt metastatic disease at presentation: analysis of trends over time. Cancer. 2012; 118(23):5768-76.

3. What impact will Cancer Care Ontario's recommendations have on a man's decision to be screened for prostate cancer?

Men in Ontario who are concerned about their risk of prostate cancer should talk to their primary care provider. Individual decisions to screen should be made as a part of a shared decision-making process involving a discussion between a man and his primary care provider.

Discussions about screening decisions should include:

- The man's risk for prostate cancer, including family history and race
- The risks associated with biopsy and subsequent treatment, if indicated
- The changing landscape of management towards active surveillance for low risk disease
- The man's general health and life expectancy, and personal preferences

CCO has developed patient and provider education materials that can be used to support the patient–provider discussions.

4. Are men in Ontario being screened properly?

Given the potential harms of screening, including over-diagnosis and over-treatment, Cancer Care Ontario does not support an organized, population-based screening program for prostate cancer. Men who are concerned about their risk of prostate cancer should talk to their primary care provider. Individual decisions to screen should be made as a part of a shared decision-making process involving a discussion between a man and his primary care provider.

5. Does the Ontario Health Insurance Plan (OHIP) pay for prostate cancer screening using the prostate-specific antigen (PSA) test?

OHIP pays for the PSA test for men who are:

- Receiving treatment for prostate cancer
- Being followed after treatment for prostate cancer
- Suspected of prostate cancer because of their family history and/or the results of their physical exam (including digital rectal examination)[1]

A population-based PSA screening program for men at average risk of prostate cancer is not currently planned by the Ontario Ministry of Health and Long-Term Care. Given the potential harms of screening, including over-diagnosis and over-treatment, Cancer Care Ontario does not support an organized, population-based screening program for prostate cancer.

References:

1. Ministry of Health and Long-Term Care. Prostate specific antigen (PSA) testing [Internet]. Toronto (ON): Queen's Printer for Ontario; 2012 [updated 2012 Jun 27; cited 2015 Jan 15]. Available from: http://www.health.gov.on.ca/english/providers/pub/cancer/psa/psa_test/insert.html.

6. Programs exist for women for breast and cervical cancer. Are men being discriminated against because there is no organized population-based screening program for prostate cancer?

Although there is currently no organized population-based screening program for prostate cancer in Ontario, there are three population-based organized screening programs: ColonCancerCheck, the Ontario Breast Screening Program and the Ontario Cervical Screening Program. The foundation of these organized screening programs is strong scientific evidence demonstrating a reduction in cancer mortality due to screening.

Considerable debate exists about whether the prostate-specific antigen test should be made available (i.e., funded) in Ontario for opportunistic prostate cancer screening in average risk men who follow a shared decision-making process with their doctor.

7. Some organizations and physicians advocate for the use of the prostate-specific antigen test. What should men who are concerned about their risk of prostate cancer do?

Men who are concerned about their risk of prostate cancer should talk to their primary care provider. Individual decisions to screen should be made as a part of a shared decision-making process involving a discussion between a man and his primary care provider.

Discussions about screening decisions should include:

- The man's risk for prostate cancer, including family history and race

- The risks associated with biopsy and subsequent treatment, if indicated
- The changing landscape of management towards active surveillance for low risk disease
- The man's general health and life expectancy, and personal preferences

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About prostate cancer

8. What is the prostate?

The prostate is a walnut-sized gland just below the bladder. It produces part of the fluid that carries sperm.

9. What is prostate cancer?

Prostate cancer is a malignant tumour that starts in cells of the prostate. A prostate tumour that is malignant can spread, or metastasize, to other parts of the body. However, in most cases, it usually grows slowly and can often be completely removed or managed successfully.

10. What causes prostate cancer?

The causes of prostate cancer are largely unknown, but it is likely that it develops as a result of a complex interplay of genetic and lifestyle factors related to hormones.[1]

Age and a family history of prostate cancer are the most well established risk factors for prostate cancer, with risk higher among older men and men who have a first-degree relative (i.e., father or brother) who has previously been diagnosed with prostate cancer.[1]

Ethnicity is also an important risk factor, with prostate cancer incidence rates highest in men of African descent and lowest in Asian men.[1]

Occupational exposure to arsenic and cadmium[2] and diets high in calcium[3] are all associated with increased prostate cancer risk, although there is presently not enough evidence to suggest that these are causal factors.

Foods containing lycopene (e.g., tomatoes and tomato products) may protect against prostate cancer; more research is needed to confirm these relationships.[3]

References:

1. Platz EA, Giovannucci E. Prostate Cancer. In: Cancer epidemiology and prevention. 3rd ed. DF Schottenfeld, editor. New York: Oxford University Press; 2006.
2. International Agency for Research on Cancer. IARC monographs on the evaluation of carcinogenic risks to humans. Volume 100C. A review of human carcinogens. Part C: Arsenic, metals, fibres, and dusts. Lyon: IARC; 2012.
3. World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: Global perspective. AICR: Washington, DC; 2007.

11. What is the natural history of prostate cancer?

Prostate cancer typically has a long natural history, which means that it grows very slowly and often does not cause harm. Studies have shown that the prevalence of undiagnosed prostate cancer in men at autopsy is high and increases with age (>40 per cent among men aged 40 to 49 years to > 70 per cent among men aged 70 to 79).[1] In some cases, prostate cancer is aggressive, which means it grows quickly and can lead to death. However, within 15 years of diagnosis, most men with prostate cancer die from other competing causes rather than from the prostate cancer itself.[2]

References:

1. Powell IJ, Bock CH, Ruterbusch JJ, et al. Evidence supports a faster growth rate and/or earlier transformation to clinically significant prostate cancer in black than in white american men, and influences racial progression and mortality disparity. J Urol 2010;183:1792–6.
2. Popiolek M, Rider JR, Andrén O, et al. Natural history of early, localized prostate cancer: a final report from three decades of follow-up. Eur Urol. 2013;63(3):428-35.

12. Does a prostate cancer diagnosis always require surgery or radiation treatment?

A man who is diagnosed with prostate cancer will not always require surgery or radiation. Treatment options depend on a man's prostate cancer disease risk (low, intermediate or high). Treatment options may include:

- Active surveillance (the cancer is monitored closely with regular tests, and if it progresses, treatment is initiated for curative intent)
- Radical prostatectomy (surgery to remove the prostate, seminal vesicles and part of the urethra within the prostate)
- External beam radiation therapy (a machine beams radiation, high-energy X-rays or particles, through the skin to the cancer and a small amount of surrounding tissue)
- Brachytherapy (radioactive isotope particles are placed in the body in or very close to the cancer cells; this is also called internal radiation therapy)
- Hormone therapy (a therapy in which the levels of male hormones, testosterone and dihydrotestosterone are reduced in the body or prevented from reaching the prostate cancer cells)
- Watchful waiting (less intensive monitoring of the cancer and initiation of treatment occurring if a man becomes symptomatic)

For more information, Cancer Care Ontario has developed a prostate cancer treatment pathway which is available at https://www.cancercare.on.ca/common/pages/UserFile.aspx?fileId=298448.

13. What are the possible complications associated with a biopsy following a positive or abnormal prostate-specific antigen test?

Men may experience some complications following a prostate biopsy, such as minor bleeding or an exacerbation of urinary symptoms. But these complications are usually minor and resolve spontaneously.[1] In approximately two to four per cent of cases, men will experience a complication requiring hospitalization within 30 days of the biopsy (usually due to an infection).[2,3] Fatal complications are very rare.[4]

References:

1. Loeb S, Vellekoop A, Ahmed HU, Catto J, et al. Systematic review of complications of prostate biopsy. Eur Urol. 2013;64(1):876-92.
2. Loeb S, van den Heuvel S, Zhu Z et al. Infectious complications and hospital admissions after prostate biopsy in a European randomized trial. Eur Urol. 2012;61(6):1110-14.
3. Nam RK, Saskin R, Lee Y et al. Increasing hospital admission rates for urological complications after transrectal ultrasound guided prostate biopsy. J Urol. 2013;189(1 Suppl):S12-7.
4. Carlsson S, Aus G, Wessman C et al. Anxiety associated with prostate cancer screening with special reference to men with a positive screening test (elevated PSA): results from a prospective, population-based, randomised study. Eur J Cancer. 2007;43(14):2109-16.

About the prostate-specific antigen test

14. What is the prostate-specific antigen (PSA) test?

The PSA test is a blood test that measures the amount of PSA in the blood. PSA is produced by the prostate and is normally present in a man's blood in small amounts. An elevated PSA level may be an indication that cancer is present. Men who have a prostate infection or prostate growth that is not cancerous (such as benign prostatic hyperplasia, or BPH) may also have high levels of PSA.

15. How accurate is the PSA test?

No test is perfect, and this is true of the PSA test.

Since the test is not accurate all the time, there are harms and benefits that can be associated with it and the procedures that may follow it. The test can be elevated in some men who don't have cancer, creating unnecessary anxiety. It can also miss some cancers in men who do have malignancies, giving them a false sense of security about their health.

Other organizations' recommendations on prostate cancer screening

16. What do other international and national organizations recommend about prostate-specific antigen (PSA) testing?

Most international and national guidelines and recommendations, including those by the Canadian Task Force on Preventive Health Care (CTFPHC), the United States Preventive Services Task Force (USPSTF) and the American College of Physicians, recommend against screening for prostate cancer using the PSA test due to the lack of conclusive evidence that prostate cancer screening reduces illness or death associated with this disease. Currently, there is not sufficient evidence to suggest a universal benefit to screening.

Canadian Task Force on Preventive Health Care[1]

The CTFPHC, an agency established by the Public Health Agency of Canada to develop clinical practice guidelines that support primary care providers in delivering preventive health care, published its recommendations on PSA screening (with or without digital rectal examination, or DRE) weighing the possible benefits against potential harms of early diagnosis and treatment of prostate cancer. Based on the lack of convincing evidence that PSA screening reduces prostate

cancer mortality, and the consistent evidence that screening and active treatment do lead to harm, the CTFPHC recommended against PSA testing to screen for prostate cancer. More specifically:

- For men younger than 55 years of age and 70 years of age and older, the CTFPHC strongly recommends against screening for prostate cancer with the PSA test. There is no evidence that screening with the PSA test reduces mortality, whereas there is evidence of harms.
- For men aged 55 to 69 years of age, the CTFPHC does not recommend screening for prostate cancer with the PSA test. There is inconsistent evidence of small potential benefits of screening and evidence of harms. This recommendation places a relatively low value on a small potential absolute decrease in prostate cancer mortality, and reflects concerns with false-positive results, unnecessary biopsies, over-diagnosis of prostate cancer and the harms associated with unnecessary treatments.
- For men aged 70 years and older, the CTFPHC strongly recommends against screening for prostate cancer with the PSA test. The recommendation reflects the lower life expectancy and the lack of evidence for benefit of screening this age group, as well as the evidence of harms.
- Groups at increased risk of prostate cancer and dying from it include men of black race and men with a family history of prostate cancer. There are no trial data showing that the benefits or harms of screening differ in these populations compared to men in the general population. However, clinicians may wish to discuss the benefits and harms of screening with men at increased risk of prostate cancer, with explicit consideration of their values and preferences.

For more information, visit the CTFPHC website at http://canadiantaskforce.ca/ctfphc-guidelines/2014-prostate-cancer/.

United States Preventive Services Task Force[2]

In 2012, the USPSTF concluded that many men are harmed as a result of prostate cancer screening and few, if any, benefit. A better test and better treatment options are needed. Until these are available, the USPSTF has recommended against PSA-based screening for prostate cancer in men in the general United States population, regardless of age.

American College of Physicians[3]

In 2013, the American College of Physicians made the following recommendations regarding prostate cancer screening using the PSA test:

- Men between the ages of 50 and 69 years should be informed about the limited potential benefits and substantial harms of screening for prostate cancer.
- The decision to screen using the PSA test should be based on a man's risk for prostate cancer, a discussion of the benefits and harms of screening, a man's general health and life expectancy, and personal preferences.
- Men who do not express a clear preference for screening should not be screened for prostate cancer using the PSA test.
- Average risk men under the age of 50 years, over the age of 69 years or with a life expectancy of less than 10 to 15 years should not be screened for prostate cancer using the PSA test.

References:

1. Canadian Task Force on Preventive Health Care, Bell N, Gorber SC, et al. Recommendations on screening for prostate cancer with the prostate-specific antigen test. CMAJ. 2014;186(16):1225-34.
2. United States Preventative Services Task Force, Moyer VA, et al. Screening for Prostate Cancer: U.S. Preventative Services Task Force Recommendation Statement. Ann Intern Med. 2012; 157: 120-134.
3. Clinical Guidelines Committee of the American College of Physicians, Qaseem A, Barry MJ, et al. Screening for prostate Cancer: A Guidance Statement From the Clinical Guidelines Committee of the American College of Physicians. Ann Intern Med. 2013:158(10):761-769.