

# Review of evidence, Prostate cancer screening in family medicine

Authors:

Intithar Hussain Alherz , Laila Ibrahim Hussain Alhejji, Zahrah ahmed alyaseen, Amnah ahmed alhuwayji, Hanin Sami bumozah, Zainab Abdulmajid Al-mubarak , Sakinah Ibrahim Ali Alfadhel, Hawraa Radhi Alsuroj

**Abstract:** The aim of this review is to determine the prevalence of PSA testing in primary care and the roles of family physicians in this matter, discuss benefits and harms of PSA testing and highlight some risk factors of prostate cancer. Comprehensive review was conducted using biomedical electronic databases such as; MEDLINE, and EMBASE, Science direct for all relevant articles published up to October, 2017. Primary care is the major setting where cancer is analyzed, or a minimum if it's assumed. Available documentation does not effectively reveal that PSA testing will certainly decrease prostate cancer death, however it accurately demonstrates a raised risk of harm. Lots of men see screening positively, however, are not aware of the possible harms. There is a visible need amongst family doctor for conclusive evidence on the equilibrium of testing advantages as well as dangers, any kind of use PSA screening to monitor for prostate cancer needs a thoughtful conversation between patient and doctor regarding the equilibrium in between significant risks and also uncertain advantages.

---

 **Introduction:**

Prostate cancer is the 4th leading cancer in both sexes and also the 2nd most frequent cancer in men. It was approximated that about 1.1 million males worldwide of prostate cancer will certainly be analyzed in 2012, which is 15% of the malignances diagnosed in guys as well as the approximated variety of fatalities will certainly be practically 307,000 [1]. Prostate cancer is one of the most typical nonskin cancer and also the 2nd leading source of male cancer fatalities amongst American guys. It is approximated that 198,100 brand-new instances of prostate cancer will certainly be detected amongst American guys in 2000 [2]. Prostate cancer is the 3rd leading reason for cancer fatality in Canadian males [3]. Concerning one in 7 males will certainly be identified with prostate cancer and also one in 27 will pass away from the condition [3]. In spite of its value as one of the most frequently identified noncutaneous cancer and also the root cause of cancer fatality amongst men, no conclusive testing device for prostate cancer exists.

Considering that its intro in the late 1980s, prostate cancer testing with prostate-specific antigen (PSA) has actually been mostly embraced throughout North America [4]. In spite of its extensive

usage, the energy of prostate cancer testing continues to be debatable. The worldwide worry of prostate cancer is anticipated to elevate 1.7 million brand-new instances as well as 499,000 fatalities by 2030 because of development and also ageing of the global populace [1].

**The aim of this review is to determine the prevalence of PSA testing in primary care and the roles of family physicians in this matter, discuss benefits and harms of PSA testing and highlight some risk factors of prostate cancer.**

### **Methodology:**

Comprehensive review was conducted using biomedical electronic databases such as; MEDLINE, and EMBASE, Science direct for all relevant articles published up to October, 2017. Our search strategy used following keywords to develop more efficient search through mentioned databases. Furthermore, references list of identified articles, were searched for more relevant articles to be added into our evidence.

### **Discussion:**

- **Risk Factors:**

#### **Age:**

Prostate cancer is an illness of aged males. Nearly 6 situations in 10 are diagnosed at the age of 65 years or later on. It is unusual prior to the age of 40, however the possibility of creating prostate cancer increases dramatically after the age of 50. The average age at the time of

identified is nearly 66 years. The age specifically 55 years as well as over had virtually 17-fold greater threat of establishing prostate cancer as compared to age less than 55 years [5]

### **Family history of prostate cancer:**

Numerous research studies have actually regularly indicated a familial gathering of prostate cancer danger, revealing 2 to 3 fold raised the danger of prostate cancer amongst male individuals that have a first-degree family member (parent, child, sibling) with a positive background of prostate cancer. y. On top of that, males having actually impacted 2 or even more first-degree family members of prostate cancer had virtually 5 times greater risk of forming the condition. The bulk (64%) of very early beginning prostate cancer situations reported a family history of this illness as well as greater than 40% having actually a verified first degree impacted family members of prostate cancer [6].

### **Diet:**

The Western way of life, specifically much more intake of fat, red meat and also milk goods could be in charge of forming the greater prostate cancer risk. In a multiethnic research study of nutritional elements, the threat of prostate cancer was favourably connected with overall fat consumption in whites, Asian Americans as well as African Americans. Mahmood et al. (2012) checked out that the threat of establishing prostate cancer was nearly 12 times greater with even more intake of red meat as well as milk items. The danger of prostate cancer was nearly 2 times greater in case of overweight males [7].

### **Sexual behavior and Sexually transmitted diseases:**

Various case-control researches reported a positive relation among prostate cancer danger as well as the background of venereal diseases (gonorrhoea as well as syphilis). Background of prostatitis

(OR 25.0, 95% CI 9.2-67.9) was observed to be positively connected with prostate cancer danger [8].

### **Smoking:**

The impacts of smoking cigarettes on the epidemiology of prostate cancer are undetermined.

Usually, smoking cigarettes has actually not been taken into consideration as a danger aspect for prostate cancer [9].

- **Prostate screening:**

The high occurrence of this cancer, the aging of the populace, the importance as well as campaigning for of people that have actually experienced it and also companies worried concerning it, in addition to the propensity for our culture to think that hostile treatment is best, have actually caused a rise in rate of interest and also use evaluating for this problem over the past years. Current proof recommends that the significant changes in prostate cancer occurrence observed in the very early 1990s could at the very least partly be credited to the intro and also extensive use prostate-specific antigen (PSA) as a screening examination [10]. Dispute exists around the worth of evaluating for prostate cancer in asymptomatic males, due to the fact that there are no finished randomized tests that have actually shown a decrease in prostate cancer death from evaluating [ 11].

Digital Rectal exam (DRE), as well as the dimension of serum prostate-specific antigen (PSA) levels, are incomplete however commonly made use of techniques of very early diagnosis.

Existing patterns of use of these testing devices have actually not been well identified, complicating our understanding of the impacts of very early discovery [12].

Central to the conversation relating to very early diagnosis of prostate cancer is the failure to compare indolent prostate cancer that does not need therapy as well as hostile prostate cancer that does need conclusive therapy. The problems of over discovery as well as overtreatment of beginning prostate cancer are additional worsened by the questionable precision of product PSA dimensions. Present assessments of the level of sensitivity as well as uniqueness of serum PSA screening for prostate cancer testing, based upon the Prostate Cancer Prevention Trial, are 21% and also 88.6%, specifically [13]. Because of this, some males with false-positive outcomes undertake unneeded and also intrusive work-ups (eg, prostatic ultrasound-guided biopsy). Lots of males with indolent prostate cancer get intrusive treatments that commonly result in treatment-related issues such as erectile disorder as well as urinary incontinence [14].

Prostate cancer screening suggestions from governmental and also expert organizations have actually conflicted over the past years, causing prospective unpredictability amongst doctors relating to proper testing techniques. Significant specialized, as well as precautionary wellness standard teams, have actually specified that the proof sustaining PSA testing wants to advise its regular usage.

Both the American Cancer Society (ACS) [15] and also the American Urologic Association have actually been significant supporters of making use of PSA testing for prostate cancer over the past years. The American Cancer Society campaigning for softened rather in the late 1990s, as confirmed by the 1997 ACS upgraded prostate cancer testing standard showing that patients must be supplied with details concerning possible advantages as well as damages of testing instead of straight suggesting PSA screening for all males over age 50 or at high danger of prostate cancer [16]. One of the most current ACS setting (May, 2000) specifies that average-risk males aged 50 or older with a lifespan of a minimum of 10 years ought to be provided with a PSA examination

each year and also be given details concerning the advantages and also constraints of screening, yet does not usually recommend mass testing, i.e., examining beyond a well-known clinician-patient relationship [17].

Numerous specialist companies have actually released contradictory referrals on prostate cancer testing (Table.1). The family doctor is confronted with the awkward job of making a decision as well as translating the proof whether which as well as how you can supply screening [18]. Most published guidelines recommend that if prostate cancer screening is performed, a combination of PSA and DRE should be used (**Table.1**). Most of them advise providing testing start at age 50, or previously in the visibility of danger elements, as well as to just do evaluating if the patient's life span goes up to 10 years (Table 1).

**Table.1:** Summary of professional organizations' recommendations on prostate cancer screening [18].

Organization	Recommendations
Canadian Cancer Society	Discuss pros and cons of screening with PSA and DRE beginning at age 50
Canadian Task Force on Preventive Health Care	Insufficient evidence to routinely include or exclude DRE; Insufficient evidence to routinely include PSA
Canadian Urological Association	Screening with PSA and DRE should be offered to all men beginning at age 50 (or 40 if risk factors are present) with a 10 year life expectancy
American Academy of Family Physicians	Insufficient evidence to assess balance of benefits and harms in men under 75; recommend against screening men over 75
American Cancer Society	Discuss pros and cons of screening beginning at age 50 (or 45 if risk factors present). Screening should consist of PSA with or without DRE
US Preventive Services Task Force (Draft recommendation released October 2011)	Recommend against routine PSA-based screening
US Preventive Services Task Force	Insufficient evidence to recommend for or against screening with PSA and/or DRE in men under age 75; recommend against routine PSA-based screening over age 75

At the time of the study, standards from the American Academy of Family Physicians (AAFP) [19] and also the United States Preventive Services Task Force (USPSTF) [20] especially advised

against evaluating guys over age 75 (the USPSTF have actually considering that launched a draft advising against regular PSA-based testing in all age). Amongst evaluated medical professionals that supply testing, the majority of them at ages 40 or 50 (97.9%), as participated, however a considerable percentage proceed providing testing at ages 90 or better (24.2%).

- **Case report:**

In the study [21] In this accomplice of guys qualified for prostate cancer screening, the period of registration in the Health Plan from 1998 with 2007 was 6.46 years. About 27% of males contended the very least one PSA examination throughout the research study duration. Patterns of PSA screening varied considerably by age (Figure1), with reduced percentages observed in the earliest and also youngest teams.

Guy aged 45-74 years, making up most of the guys screened, had comparable same screening percentages, about 36%, when age was broken down by decides. Just 19% of individuals below age 45 years went through PSA examinations, while 28% of males aged 75-- 84 years were examined. The oldest subgroup, males age 85 years as well as older, had the most affordable percentage of PSA screening: 13%. Additionally, the overall proportion of PSA testing varied slowly across racial groups, with white males (33.5%) having the biggest proportion of PSA screening, followed by black females (30.4%), Asian men (30.0%), and Hispanic men (28.5%, Figure 1).

	PSA test		No PSA		Total
	n	%	n	%	
Eligible patients	572,306	27.77	1,488,741	72.23	2,061,047
Age at Baseline <sup>b</sup> (years)					
<45	131,510	18.55	577,284	81.45	708,794
45–54	202,931	30.39	464,884	69.61	667,815
55–64	136,113	36.39	237,977	63.61	374,090
65–74	73,772	36.95	125,856	63.05	199,628
75–84	25,531	28.02	65,578	71.98	91,109
≥85	2557	13.03	17,073	86.97	19,630
Race/ethnicity					
White	205,817	33.54	407,738	66.46	613,555
Black	42,926	30.35	98,500	69.65	141,426
Asian	29,486	29.98	68,868	70.02	98,354
Hispanic	102,971	28.49	258,481	71.51	361,452
Other	1811	31.11	4010	68.89	5821

**Figure.1.** Characteristics of 2,061,047 men enrolled in KPSC 1998-2007, by PSA status care (KPSC-Kaiser Permanente Southern California . PSA –prostate-specific antigen).[21]

Race plays very small factor: the proportion of whites who were screened was 10% higher than blacks, Hispanics, and Asians, all of whom had similar rates of testing.

Age was a great element in this evaluation, with the youngest and also eldest males much less most likely to go through PSA screening. In a research of self-reported information from the National Health Interview Survey [22], revealed that the rate of PSA screening for males aged 40 to 49 years was 16%, whereas males aged 50 to 69 years had a rate of 49%.

- **Harms and benefits of treatment:**

Two researches [23], [24] revealed that radical prostatectomy decreased prostate cancer death between males with symptomatic very early prostate cancer. Accomplice researchers reported reduced prostate cancer death [25] as well as all-cause death [25] connected with radical prostatectomy. There was no test proves to show that radiation treatment enhances medical end results in males with prostate cancer, although pooled evaluations of empirical information



recommended that radiation treatment (alone or in mix with hormone treatment) minimizes prostate cancer death as well as all-cause death [26]. No research studies revealed that hormone treatment lowered all-cause or prostate cancer death, and also no research studies of the impact of cryotherapy or high-intensity focal ultrasonography on all-cause or prostate cancer death were recognized [27].

The dangers of PSA testing associate with the examination and also therapy of prostate cancer in guys with real- and also false-positive examination outcomes as well as in males whose found prostate cancer would certainly not have actually triggered them signs or fatality (i.e., over-diagnosis).

Male that have a positive PSA examination outcome are generally welcomed for additional screening, which generally consists of prostate biopsy. Relying on the selected method for the PSA examination limit as well as the regularity of screening, men that go through PSA testing can possibly have numerous biopsies with time, consequently enhancing their danger of harms.

Harms of prostate biopsy can be hematuria, infection, hospital admission and even death. Studies showed that an estimated 31% of men (310 men per 1000) had hematuria up to 30 days after biopsy and that 0.9% of men (9 per 1000) had infection [27].

## **Conclusion:**

Primary care is the major setting where cancer is analyzed, or a minimum if it's assumed.

Available documentation does not effectively reveal that PSA testing will certainly decrease prostate cancer death, however it accurately demonstrates a raised risk of harm. Lots of men see screening positively, however, are not aware of the possible harms. There is a visible need amongst family doctor for conclusive evidence on the equilibrium of testing advantages as well as dangers, any kind of use PSA screening to monitor for prostate cancer needs a thoughtful conversation between patient and doctor regarding the equilibrium in between significant risks and also uncertain advantages.

### Reference:

1. Ferlay J, Shin HR, Bray F, et al (2010). GLOBOCON 2008, Cancer incidence and mortality worldwide: IARC, Cancer Base No. 10. Lyon France: Int Agency Res Cancer
2. Greenlee RT, Hill-Harmon MB, Murray T, Thun M. Cancer statistics, 2001. CA Cancer J Clin. 2001 Jan-Feb; 51(1):15-36.
3. Canadian Cancer Society's Steering Committee on Cancer Statistics. Canadian Cancer Statistics 2011. Toronto, ON: Canadian Cancer Society; 2011.
4. Bunting PS, Goel V, Williams JI, Iscoe NA. Prostate-specific antigen testing in Ontario: reasons for testing patients without diagnosed prostate cancer. CMAJ. 1999 Jan 12; 160(1):70-5.
5. American Cancer Society: Facts & Figures 2015. Atlanta, G A: American Cancer Society, 2015.
6. Stanford JL, Ostrander EA (2001). Familial prostate cancer. Epidemiol Rev, Turner E L, Lane J A, Donovan J L, Davis M J, et al (2011). Association of diabetes mellitus with prostate cancer: nested case- control study (Prostate testing for cancer and treatment study). Int J Cancer, 128, 440-6.
7. Wittemore AS, Kolonel LN, Wu AH, et al (1995). Prostate cancer in relation to diet, physical activity and body size in blacks, whites, and Asians in U.
8. Hosseini M, SeyedAlinaghi S, Mahmoudi M, McFarland W (2010). A case-control study of risk factors for prostate cancer in Iran. Acta Med Iran, 48, 61-6.
9. Huncharek M, Haddock KS, Reid R, Kupelnick B (2010). Smoking as a risk factor for prostate cancer: a meta-analysis of 24 prospective cohort studies. Am J Public Health, 100, 693-701.

10. Hankey BF, Feuer EJ, Clegg LX, Hayes RB, Legler JM, Prorok PC, Ries LA, Merrill RM, Kaplan RS .J Natl Cancer Inst Cancer surveillance series: interpreting trends in prostate cancer--part I: Evidence of the effects of screening in recent prostate cancer incidence, mortality, and survival rates. 1999 Jun 16; 91(12):1017-24.
- 11.Boyle P.Ann Oncol. Prostate specific antigen (PSA) testing as screening for prostate cancer: the current controversy.1998 Dec; 9(12):1263-4.
- 12.Grönberg H .Prostate cancer epidemiology.Lancet. 2003 Mar 8; 361(9360):859-64
13. Thompson IM, Ankerst DP, Chi C, Goodman PJ, Tangen CM, Lucia MS, Feng Z, Parnes HL, Coltman CA Jr .J Natl Cancer Inst. Assessing prostate cancer risk: results from the Prostate Cancer Prevention Trial. 2006 Apr 19; 98(8):529-34.
- 14.Bacon CG, Giovannucci E, Testa M, Kawachi I .The impact of cancer treatment on quality of life outcomes for patients with localized prostate cancer. J Urol. 2001 Nov; 166(5):1804-10.
15. Mettlin C, Jones G, Averette H, Gusberg SB, Murphy GP CA Cancer J Clin. Defining and updating the American Cancer Society guidelines for the cancer-related checkup: prostate and endometrial cancers. 1993 Jan-Feb; 43(1):42-6.
16. von Eschenbach A, Ho R, Murphy GP, Cunningham M, Lins N .CA Cancer J Clin. American Cancer Society guideline for the early detection of prostate cancer: up.1997 Sep-Oct; 47(5):261-4
17. Smith RA, von Eschenbach AC, Wender R, Levin B, Byers T, Rothenberger D, Brooks D, Creasman W, Cohen C, Runowicz C, Saslow D, Cokkinides V, Eyre H, 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. CA Cancer J Clin. 2001 Jan-Feb; 51(1):38-75; quiz 77-80
18. Allard CB, Dason S, Lusic J, Kapoor A. Prostate cancer screening: Attitudes and practices of family physicians in Ontario. Canadian Urological Association Journal. 2012;6(3):188-193. doi:10.5489/cuaj.11290.
- 19.. American Academy of Family Physicians: Prostate Cancer. Available:<http://www.aafp.org/online/en/home/clinical/exam/prostatecancer.html> (Accessed May 2, 2012)
20. U.S. Preventive Services Task Force. Screening for prostate cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2008 Aug 5; 149(3):185-91.
21. Lauren Wallner, PhD, MPH, Stanley Frencher, MD, Jin-Wen Hsu, PhD, Ronald Loo, MD, Joice Huang, PharmD, MBA, Michael Nichol, PhD, and Steven Jacobsen, MD, PhD . Prostate Cancer Screening Trends in a Large, Integrated Health Care System. Perm J. 2012 Summer; 16(3): 4–9.

22. Ross LE, Berkowitz Z, Ekwueme DU

Use of the prostate-specific antigen test among U.S. men: findings from the 2005 National Health Interview Survey. *Cancer Epidemiol Biomarkers Prev.* 2008 Mar; 17(3):636-44.

23. Bill-Axelson A, Holmberg L, Ruutu M, Garmo H, Stark JR, Busch C, Nordling S, Häggman M, Andersson SO, Bratell S, Spångberg A, Palmgren J, Steineck G, Adami HO, Johansson JE, SPCG-4 Investigators. Radical prostatectomy versus watchful waiting in early prostate cancer. *N Engl J Med.* 2011 May 5; 364(18):1708-17.

24. Wilt TJ, Brawer MK, Jones KM, Barry MJ, Aronson WJ, Fox S, Gingrich JR, Wei JT, Gilhooly P, Grob BM, Nsouli I, Iyer P, Cartagena R, Snider G, Roehrborn C, Sharifi R, Blank W, Pandya P, Andriole GL, Culkin D, Wheeler T, Prostate Cancer Intervention versus Observation Trial (PIVOT) Study Group.

Radical prostatectomy versus observation for localized prostate cancer. *N Engl J Med.* 2012 Jul 19; 367(3):203-13.

25. Abdollah F, Sun M, Schmitges J, Tian Z, Jeldres C, Briganti A, Shariat SF, Perrotte P, Montorsi F, Karakiewicz PI

Cancer-specific and other-cause mortality after radical prostatectomy versus observation in patients with prostate cancer: competing-risks analysis of a large North American population-based cohort. *Eur Urol.* 2011 Nov; 60(5):920-30.

26. Albertsen PC, Hanley JA, Penson DF, Barrows G, Fine J

13-year outcomes following treatment for clinically localized prostate cancer in a population based cohort. *J Urol.* 2007 Mar; 177(3):932-6.

27. Dunfield L, Usman A, Fitzpatrick-Lewis D, et al., editors. , editors. Screening for prostate cancer with prostate specific antigen (PSA) and treatment of early-stage or screen-detected prostate cancer: a systematic review of the clinical benefits and harms. Ottawa: Canadian Task Force on Preventive Health Care; 2013.

# IJSER