

Screening Brief

Prostate cancer

Incidence and mortality

- ! Second most common cancer among men in economically developed countries (about 3% of deaths from all causes)
- ! The number of deaths doubled from 4200 in 1973 to 8600 in 1993 in England and Wales. Mortality in England and Wales was 200 per 100 000 in 1989¹ in men aged 65-84, and incidence was 320 per 100 000.² Incidence has increased to a greater extent owing to the detection of incidental disease arising from an increased biopsy rate

Screening tests

- ! PSA (prostate specific antigen) in serum. A higher PSA cut off of 12 times the age specific median yielded the following estimates of screening performance (from measurements on stored serum in cohort studies³):

Detection rate	85% Based on clinical cancers that would develop over the subsequent 3 years
False positive rate	0.5%
Odds of being affected given a positive result	1 to 1 Based on prevalence of prostate cancer in men aged 60-74 of 8 per 1000 (derived from OPCS data)

A proposed cut off level of >4ng/ml would yield excessively high false positive rates - about 8.5% at age 60-69 and 26% at age 70 and over.³ Indirect measures of screening performance (combining results from many published studies) with a cut off level of about 10 ng/ml⁴ yielded an estimated detection rate of 49% (from symptomatic men with a histological diagnosis) with a 1% false positive rate (from asymptomatic men)

- ! DRE (digital rectal examination) estimated false positive rates are 5-11%, too high for screening for prostate cancer
- ! TRUS (transrectal ultrasound) A

Diagnostic test

- ! Transrectal needle biopsy of the prostate under ultrasound guidance

Natural history

- ! Variable, ranging from latent or very slow growing (necropsy studies show that around one third of men over the age of 65 have latent prostate cancer) to highly malignant fast growing tumours. Histological grade (Gleason score) is the best predictor of malignancy

Treatments for screen detected disease

- ! 'Watchful waiting' is not a realistic option with screening. Radical prostatectomy, radiotherapy, or hormone treatment, used to treat symptomatic disease, may not be appropriate in a screening programme because they are all associated with significant complications
- ! Local treatment such as inserting radioactive (I^{125}) seeds into the prostate may be an appropriate treatment option, but its effectiveness has not been tested in a randomised trial

Effectiveness of screening

- ! It is not known whether treatment in screen positive men improves prognosis. Randomised controlled trials of screening using several methods (PSA, DRE and TRUS) are underway but will take many years to complete

Overall assessment

- ! Population screening for prostate cancer has not been shown to be worthwhile and may be harmful
- ! Screening activity is only justified as part of a randomised controlled trial to determine its value

1. Office of Population Censuses and Surveys. Mortality Statistics (cause). London: HMSO, 1991. (Series DH2, no 16.)

2. Office of Population Censuses and Surveys. Cancer statistics (registrations). London: HMSO, 1994. (Series MB1, no 22.)

3. Parkes C, Wald NJ, Murphy P, et al. Prospective observational study to assess value of prostate specific antigen as screening test for prostate cancer. *BMJ* 1995;**311**:1340-3.

4. Parkes CA. An epidemiologist's viewpoint on screening. *Cancer surveys* No 23: Preventing prostate cancer: Screening versus chemoprevention. London: Imperial Cancer Research Fund, 1995.