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fact sheet

Prostate cancer and the PSA test

Prostate cancer affects one in nine Australian males up to the age of 75 years, and one in five by age 85 years. The risk of death is lower, however: one in 84 men under the age of 75 years and one in 22 by the age of 85 years.

Testing for prostate cancer

Prostate cancer is diagnosed using a range of tests, including the PSA blood test. A normal prostate secretes a protein into the ejaculate called prostate specific antigen (PSA). This protein helps to nourish sperm in the ejaculate and only tiny amounts of PSA leech into the bloodstream. However, cancer cells in the prostate interfere with proper functioning and cause large amounts of PSA to enter the blood.

In around one in three cases, a high PSA level is caused by cancer. Another common cause of elevated PSA is a prostate condition called benign prostatic enlargement. For this reason, the PSA blood test isn't used in isolation when checking for prostate cancer. A digital rectal examination (DRE) is recommended together with a PSA test to detect prostate cancer. If a PSA test or a DRE is abnormal, further investigation such as a tissue biopsy is needed to confirm the diagnosis.

Normal PSA levels

The prostate slowly enlarges with age, so the production of PSA rises accordingly. It is usually recommended that a PSA greater than 4ng/ml (nanograms per millilitre) should be followed up with further tests. Generally, the healthy upper limits of PSA levels in the blood increase with age. One US study suggests the following 95 per cent limits:

- **40–49 years – 2.0ng/ml**
- **50–59 years – 3.0ng/ml**
- **60–69 years – 4.0ng/ml**
- **70–79 years – 5.5ng/ml.**

Other factors that influence PSA levels

The PSA blood test isn't conclusive. It is possible, although rare, to have prostate cancer without elevated PSA levels in the blood. A higher than normal PSA level doesn't automatically indicate prostate cancer either. PSA can be raised by other factors, including:

- Infection of the prostate (prostatitis)
- Benign prostatic enlargement (BPE).

Tests – apart from PSA

Apart from the PSA blood test, other diagnostic tests for prostate cancer include:

- **Rectal examination** (DRE) – the doctor feels for enlargement of the prostate gland or other changes.
- **Biopsy** – small samples of tissue are removed from the prostate and examined.

Further tests

If cancer is diagnosed, the following tests may be used to determine the stage of progression of the cancer:

- **Bone scan** – to check whether or not cancer cells have migrated to the bones.
- **Computed tomography (CT) scan** – a specialised x-ray.
- **Pelvic lymph node dissection** – a nearby lymph node is removed and examined to check whether or not cancer cells have entered the lymphatic system (this is only done during surgery on the prostate).

Early detection and screening

Prostate cancer is typically slow-growing. High PSA levels can occur five to 10 years before the onset of prostate cancer symptoms, and early prostate cancer often has no symptoms. The PSA test can detect cancer at this early stage. At present, however, health authorities do not recommend widespread screening for prostate cancer. This is because we don't yet have reliable evidence that screening reduces death from prostate cancer. However, that evidence may come in the near future with the reporting of large-scale trials of screening currently underway.

Most authorities suggest that a man makes his own choice about whether or not to be 'screened' (tested regularly) for prostate cancer. This should be done in discussion with your doctor, after considering the benefits and uncertainties of testing and your own risk from the disease. In Australia, Medicare covers an annual check, but this may not be necessary for all men who choose to be screened. The frequency with which you should be checked will be influenced by your first test result. The Urological Society of Australia and New Zealand recommends that men aged 50–70 years (or men over 40 years who have a strong family history) should be able to access screening by annual DRE and PSA testing.

Other forms of PSA testing

Researchers are devising ways to make the PSA blood test more accurate in diagnosing prostate cancer. One promising test is the 'free to total' PSA test. In both healthy men and those with prostate cancer, the prostate specific antigen in the bloodstream latches onto protein. In men with benign prostatic enlargement, the prostate specific antigen tends to be free of protein.

The 'free to total' PSA test compares the amount of bound to unbound PSA to see whether the elevated levels are caused by prostate cancer or benign disease. The lower the 'free to total', the higher the probability of prostate cancer. The probability of cancer is higher if the 'free to total' ratio is less than 20–25 per cent.

The rate of change of PSA (PSA velocity) can also be helpful in finding prostate cancer. In men with PSA above 4ng/ml, a velocity of greater than 0.75ng/ml/yr is thought to indicate a higher risk of cancer. This threshold may be lower in men with a PSA below 4ng/ml.

Monitoring cancer

After a diagnosis of cancer, regular PSA blood tests are also used to monitor the cancer activity in a man's body. Generally, prostate cancer prompts higher and higher levels of blood-borne PSA as it grows. Regular blood tests can indicate whether the tumour is shrinking or enlarging, and if the current treatment is working or not.

Where to get help

- Your doctor
- Urologist
- Cancer Council of Victoria, Information and Support Service Tel. 131 120

Things to remember

- A normal prostate secretes small amounts of a protein called prostate specific antigen (PSA) into the ejaculate and blood.
- Prostate cancer usually causes large amounts of PSA to enter the blood.
- The PSA blood test can detect prostate cancer at an early stage, before it causes symptoms and when it can be removed.
- An abnormal PSA test can have a number of non-cancer causes. Other tests are needed to confirm the diagnosis.

This page has been produced in consultation with, and approved by:

Australian Prostate Cancer Collaboration