Prostate cancer and the PSA test

A PSA blood test can be used to help diagnose prostate cancer at an early stage, before it causes symptoms and when it can be removed. The normal prostate gland makes a protein called prostate specific antigen (PSA). This protein helps to nourish sperm 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.

When high levels of PSA are detected in the bloodstream, this may indicate cancer. Other tests are needed to confirm the diagnosis, however, because an abnormal PSA test can have a number of non-cancer causes.

Normal PSA levels
The prostate slowly enlarges with age and the production of PSA will also rise. Generally, the healthy upper limits of PSA levels in the blood increase with age. One study suggests they may be between 2 and 5.6ng/ml (nanograms per millilitre) in men over 40 years. It is usually recommended that a PSA greater than 4ng/ml should be followed up with further tests.

Other factors that influence PSA levels
Prostate cancer is diagnosed using a range of tests, including the PSA blood test. The PSA blood test isn't conclusive. It is possible, although rare, to have prostate cancer without raised PSA levels in the blood. A higher than normal PSA level doesn't automatically indicate prostate cancer either. A high PSA level is due to cancer in around one in three cases.

PSA can be raised by other factors, including:

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

For this reason, the PSA blood test isn't used in isolation when checking for prostate cancer.

Tests – apart from PSA
Other diagnostic tests for prostate cancer include:

- **Digital 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.

If cancer is diagnosed, further tests may be needed to determine the stage of progression of the cancer. These may include a bone scan, a computed tomography (CT) scan or a pelvic lymph node dissection.

Early detection and screening
Prostate cancer is typically slow growing. High PSA levels can occur five to ten years before the onset of prostate cancer symptoms and early prostate cancer often has no symptoms. The PSA test can help to detect cancer at this early stage.

At present, however, health authorities do not recommend widespread 'screening' for prostate cancer. While we have some evidence that regular testing may prevent prostate cancer deaths, there are concerns that many men may be diagnosed and treated unnecessarily as a result of being screened, with a high cost to their health and quality of life.

Discuss testing with your doctor
Most authorities suggest that a man makes his own choice about whether or not to be screened 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.

The Urological Society of Australia and New Zealand has suggested that a single test at the age of 40 years or more may be the best way of assessing a man's risk of prostate cancer over the following 15–20 years. Men with a father or brother who were diagnosed with prostate cancer at an early age are also at higher risk.

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. If a man chooses to be tested for prostate cancer, both a PSA test and DRE are recommended to give the best chance of detecting the cancer.

Other forms of PSA testing
New forms of the PSA blood test make it more accurate in diagnosing prostate cancer. One such 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 raised levels are caused by prostate cancer or benign disease. 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. 13 11 20

Things to remember

- A normal prostate gland 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 result can have a number of non-cancer causes. Other tests are needed to confirm the diagnosis.
- Prostate cancer testing and treatment is less likely to have a benefit in older men, particularly those over the age of 75 years.

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

Australian Prostate Cancer Collaboration