TEST

Prostate-specific antigen (PSA) blood test

A PSA blood test measures a prostate protein that can help assess or monitor prostate conditions.

WHAT IT MEASURES
Prostate-specific antigen, a protein made mainly by prostate cells

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
A few days; timing differs by laboratory

USED FOR
Screening, investigating symptoms, and monitoring prostate conditions

MAIN LIMITATION
Benign prostate changes can raise PSA, while cancer may not

Overview

A prostate-specific antigen, or PSA, test measures the amount of PSA in your blood. PSA is a protein made mainly by cells in the prostate, a gland below the bladder that helps produce semen.

A raised PSA level does not mean that you have prostate cancer. Common non-cancerous causes include an enlarged prostate, inflammation, a urinary infection, ejaculation, and recent procedures involving the prostate or bladder.

Prostate cancer can also raise PSA. However, some prostate cancers produce little PSA, so a lower result cannot completely rule cancer out.

The test may be offered because of symptoms, as part of an informed discussion about prostate cancer screening, or to monitor a known prostate condition. It is one piece of information rather than a diagnosis by itself.

Why the test is ordered

A PSA test may help investigate symptoms that could come from the prostate. These can include difficulty starting urination, a weak urine flow, needing to urinate more often, or feeling that the bladder has not emptied.

These symptoms are often caused by benign prostate enlargement rather than cancer. A clinician may consider your symptoms, examination findings, urine tests, medical history, and PSA result together.

The test can also be used:

After prostate cancer treatment, the meaning of PSA depends on the treatment. For example, PSA is expected to become very low after the entire prostate has been removed, while some PSA may remain after radiotherapy because prostate tissue is still present.

- To support an informed decision about prostate cancer screening
- To monitor a previously raised PSA
- Alongside other tests when prostate cancer is suspected
- To monitor prostate cancer that is being observed rather than treated immediately
- After treatment, to look for changes that may need further assessment

Who should have the test

There is no single screening plan that is right for everyone. Whether to have a PSA test when you have no symptoms is a personal decision made after discussing possible benefits and harms.

Factors that may affect the discussion include your age, general health, preferences, family history, Black ancestry, and inherited gene changes associated with prostate cancer. Screening may be less helpful if other serious health conditions are more likely to limit life expectancy.

You may be offered the test if you have urinary symptoms, an abnormal prostate examination, or findings on another test. It is also commonly used if you have already been diagnosed with prostate cancer.

People who were born with a prostate generally keep it unless it is surgically removed. This includes many transgender women and non-binary people. Gender-affirming hormones may lower PSA, so results need interpretation in that context.

How to prepare

You usually do not need to fast. You can normally eat and drink before the test unless you are having other blood tests that require fasting.

Follow the instructions from the service arranging your test. Many services advise avoiding ejaculation and vigorous exercise, particularly cycling, for about 48 hours beforehand because these may temporarily raise PSA.

Tell the clinician arranging the test about:

Do not stop a prescribed medicine just to prepare for the test. The person interpreting the result needs to know what you take.

A PSA test may be postponed after a urinary infection or a procedure involving the prostate. The appropriate waiting time depends on what happened and your clinical situation.

- Urinary infection symptoms or recent prostatitis
- Recent catheter use, cystoscopy, prostate biopsy, or prostate surgery
- Medicines for an enlarged prostate or hair loss
- Testosterone or other hormone treatment
- Previous prostate cancer treatment

What happens during the test

A healthcare professional places a band around your upper arm and cleans the skin. A small needle is inserted into a vein, usually inside your elbow, and a tube of blood is collected.

The blood draw usually takes only a few minutes. You can generally return to normal activities straight away.

The sample is sent to a laboratory to measure total PSA. In some situations, the laboratory may also measure free PSA, which is PSA circulating without being attached to other blood proteins.

Understanding your results

PSA is usually reported in nanograms per millilitre, written as ng/mL. A higher value means more PSA was detected, but it does not identify the cause.

There is no PSA level that reliably separates cancer from non-cancerous conditions. Cancer

may be found at a relatively low PSA, while a much higher result can come from benign prostate enlargement or inflammation.

Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context. Pregnancy is not usually relevant to routine PSA testing, but anatomy and hormone treatment can affect whether PSA testing and standard comparisons are appropriate.

Interpretation may consider:

A repeat result can be useful when PSA is unexpectedly raised. Additional measurements, such as the proportion of free PSA or PSA density, may sometimes help. PSA density compares the result with prostate size, usually measured by imaging.

- Your current PSA and previous results
- How quickly the result has changed
- Your age and prostate size
- Symptoms and examination findings
- Medicines and recent infections or procedures
- Whether you have had prostate cancer treatment

What affects the results

Several things can change PSA without a laboratory error.

Benign prostate enlargement commonly raises PSA because a larger prostate contains more PSA-producing tissue. Prostatitis, meaning inflammation of the prostate, and urinary infections can also cause a temporary increase.

Ejaculation and vigorous exercise, particularly activities that put pressure on the prostate such as cycling, may raise PSA for a short time. The size and importance of this change differ between people.

A prostate examination usually has little effect, but a biopsy, catheter, cystoscopy, urinary retention, or other recent procedure may produce a more noticeable increase.

Finasteride and dutasteride, used for prostate enlargement or hair loss, can lower PSA substantially. Hormone treatments that reduce testosterone can also lower it. Testosterone treatment may change PSA and needs to be considered when comparing results.

Age and prostate size affect the expected level. Obesity may sometimes make PSA appear lower because the protein is diluted in a larger blood volume.

Kidney function has little effect on total PSA in most people, although severe kidney impairment can affect some free-PSA measurements. A recent blood transfusion is not generally considered an important influence on PSA.

Accuracy and limitations

PSA testing can find a warning sign before prostate cancer causes symptoms, but it is not accurate enough to diagnose or exclude cancer on its own.

The test can say that further investigation may be needed when no cancer is present. This is called a false-positive result. It can lead to repeat blood tests, imaging, worry, and sometimes a biopsy.

It can also give a reassuring result when cancer is present. This is called a false-negative result. Some prostate cancers release little PSA, and there is no cutoff that detects every cancer.

Screening can identify cancers that would never have caused illness during a person's lifetime. This is called overdiagnosis. Treatment of such cancers can cause harm without providing a clear benefit.

If further assessment is needed, an MRI scan is often better for showing suspicious areas in the prostate. A biopsy, in which small tissue samples are examined under a microscope, is the test that can confirm whether prostate cancer is present.

Risks and complications

The PSA test itself has the usual minor risks of a blood draw. You may have brief pain, a small bruise, or feel faint.

Most effects settle quickly. The more important potential harms come from decisions based on the result, including unnecessary investigations or detection of a cancer that would never have caused problems.

What happens next

A result that fits your age, history, and previous measurements may need only routine follow-up. If the result is unexpectedly raised, it may be repeated after avoiding temporary influences or allowing an infection to settle.

Further assessment may include a urine test, prostate examination, MRI scan, specialist

review, or biopsy. A referral does not mean that cancer has been diagnosed.

Contact a healthcare service promptly if you have fever or chills with painful or difficult urination, as this can suggest an infection needing timely treatment. Being unable to urinate, especially with increasing lower abdominal pain, requires urgent assessment.

The PSA number alone is not usually an emergency. Its importance comes from the pattern over time and the rest of your clinical information.

Common questions

Can I drink coffee before a PSA test?

Yes. PSA testing does not normally require fasting, so coffee is usually allowed. Check your instructions if other blood tests are being collected at the same appointment.

Does the time of day matter?

PSA is not usually scheduled for a particular time of day. Having repeat tests under similar conditions can make comparisons easier.

Can I exercise beforehand?

Light activity is unlikely to matter. Many testing services recommend avoiding vigorous exercise and cycling for about 48 hours because they may temporarily raise PSA.

Can I have sex before the test?

Ejaculation may briefly increase PSA. You may be advised to avoid ejaculation for about 48 hours before the blood draw.

What if I have a urine infection?

Tell the service arranging the test. Infection can raise PSA, so testing is often delayed until the infection has been treated and enough time has passed for the prostate to settle.

Does a high PSA mean I need a biopsy?

Not necessarily. The result may first be repeated, and an MRI or other assessment may help decide whether a biopsy is appropriate.

Sources

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- American Urological Association and Society of Urologic Oncology. Early Detection of Prostate Cancer Guideline, 2023
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