TEST

Tularemia blood test

A tularemia blood test looks for antibodies made in response to Francisella tularensis infection.

WHAT IT MEASURES
Antibodies against the bacteria that cause tularemia

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually under 10 minutes

RESULTS IN
Several days to two weeks, varying by laboratory

USED FOR
Diagnosis

MAIN LIMITATION
Early infection can produce a negative antibody result

Overview

A tularemia blood test usually checks for antibodies against Francisella tularensis , the bacteria that cause tularemia. Antibodies are proteins made by your immune system after it encounters an infection.

This type of blood test is called serology. Laboratories may use methods such as an agglutination test, which looks for antibodies that make bacterial particles clump, or an enzyme immunoassay.

Antibodies take time to develop. A sample collected during the first days of illness may be negative even when tularemia is present. For this reason, testing may involve two blood samples taken weeks apart.

Blood may also be used for culture or molecular testing, but those tests look directly for the bacteria or their genetic material. They are different from the antibody test discussed mainly in this article.

Why the test is ordered

The test can help investigate an illness that could be tularemia. It is interpreted alongside your symptoms, examination, exposure history, and sometimes other laboratory tests.

Tularemia can occur after exposure to infected ticks or biting flies, wild animals such as rabbits and rodents, contaminated water, or airborne material during activities such as landscaping. Laboratory exposure is another possible reason for testing.

Depending on where the infection entered the body, tularemia may cause fever with a skin ulcer, swollen lymph nodes, sore throat, eye inflammation, or pneumonia. These features can also have other causes, so the blood result cannot make the diagnosis by itself.

Who should have the test

Testing is most useful when you have a compatible illness and a possible exposure to F. tularensis . A healthcare professional may also order it when unexplained fever, swollen lymph nodes, a skin ulcer, or pneumonia has not been explained by more common conditions.

Routine screening of people without symptoms or a relevant exposure is generally not useful. Antibodies can remain in the blood after an old infection, so testing without a clear clinical reason may produce a result that is difficult to interpret.

Public health authorities may help arrange testing when tularemia is suspected because some tests are performed only in specialist or reference laboratories.

How to prepare

You do not usually need to fast. You can generally eat, drink water, and take your usual medicines unless you have been given separate instructions for another test collected at the same appointment.

Tell the healthcare professional arranging the test:

Do not stop prescribed medicines before the test unless the person responsible for your care tells you to.

- When your symptoms began
- Whether you have taken antibiotics like amoxicillin or doxycycline for the current illness
- About tick, animal, water, landscaping, or laboratory exposures

- Whether you have previously had tularemia
- About conditions or medicines that weaken your immune system

What happens during the test

A healthcare worker cleans an area of skin, usually inside your elbow, and places a small needle into a vein. Blood is collected into one or more tubes.

You may feel a brief scratch or sting. The needle is then removed, and pressure or a small dressing is applied.

If the first sample was collected early, you may be asked to return for a second sample several weeks later. Comparing the two results can show whether your antibody level has risen.

Understanding your results

Results may be reported as negative, positive, equivocal, or as an antibody titre. A titre describes how much a blood sample can be diluted before antibodies are no longer detected.

A negative result means the laboratory did not detect antibodies above its cutoff. This makes tularemia less likely if the sample was taken late enough, but it does not rule out an infection during the first two to three weeks of illness.

A positive result means antibodies were detected. It can support a recent infection when your illness and exposure history fit, but a single positive result may reflect an older infection or a reaction with antibodies to another bacterium.

An equivocal or borderline result is not clearly positive or negative. Another sample or a different test may be needed.

A change from a negative first sample to a positive later sample strongly supports recent infection. A substantial rise in the antibody titre between paired samples can provide similar evidence.

There is no single universal reference range for all tularemia antibody tests. Cutoffs and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context, although some of these factors affect the clinical interpretation more than the antibody measurement itself.

What affects the results

Timing is the most important influence. Antibodies are often not detectable until two to three weeks after symptoms begin. Testing too early can therefore give a negative result even when infection is present.

Other influences include:

Food, coffee, time of day, and ordinary physical activity are not known to meaningfully change tularemia antibody levels.

- Previous tularemia: Antibodies may remain detectable for years, making an old and current infection harder to separate
- Cross-reactions: Antibodies to other bacteria, particularly Brucella , can sometimes react in a tularemia test
- A weakened immune response: Immune-suppressing conditions or medicines may delay or reduce antibody production
- Antibiotic treatment: Treatment history matters when all results are interpreted, especially if culture or molecular tests were also performed
- Laboratory method: Different methods, bacterial strains used in the assay, and reporting cutoffs may produce different results
- Sample timing: Paired samples are useful only when collected far enough apart to show a meaningful change

Accuracy and limitations

The accuracy of the test changes with the stage of illness and the method used. Because antibodies develop slowly, serology misses many infections when blood is collected early. A later sample is more likely to detect the immune response.

False-positive results can occur. A positive test may represent previous tularemia rather than current illness, and antibodies to another infection can occasionally react with the assay. Confirmation by a reference laboratory or evidence of rising antibodies may reduce this uncertainty.

Serology does not show where the infection is located, how severe it is, or whether the bacteria are still alive. It should not be used alone to decide whether symptoms are caused by tularemia.

When illness is recent, a direct test may be better. Culture or a molecular test may be performed on material from a skin ulcer, lymph node, eye, throat, respiratory tract, or blood. The best specimen depends on the form of illness. Culture can confirm infection, but F.

tularensis can be difficult to grow and presents an exposure risk to laboratory workers, so the laboratory needs advance warning when tularemia is suspected.

Risks and complications

A blood draw may cause brief discomfort, a small bruise, or light-headedness. Serious complications from routine blood collection are uncommon.

What happens next

If the result is negative but the sample was collected early, routine follow-up may include another antibody test several weeks later. A healthcare professional may also arrange culture or molecular testing from the part of the body most likely to contain the bacteria.

A positive result is reviewed with your symptoms, exposure history, previous test results, and any treatment already received. The laboratory or public health service may perform confirmation testing.

Do not wait for a test result if you are becoming more unwell. Seek prompt medical advice for worsening fever, increasing breathlessness, inability to drink enough fluid, spreading skin redness, or eye pain with changes in vision.

Call emergency services for severe trouble breathing, blue or grey lips, new confusion, fainting, or difficulty waking. These symptoms require urgent assessment regardless of the suspected cause.

Common questions

Can I drink coffee before the test?

Yes. Coffee does not affect tularemia antibody testing. If other blood tests are being collected, follow any fasting instructions given for those tests.

Does the time of day matter?

No. Tularemia antibody levels are not known to change enough during the day to affect routine interpretation.

Can I exercise beforehand?

Yes. Ordinary exercise is not known to alter the result. If exercise makes you dehydrated or likely to feel faint during a blood draw, drink water and rest first.

Can antibiotics make the test negative?

Antibody tests may still become positive after antibiotics, but treatment and immune response can affect the overall pattern of results. Tell the person reviewing the test which antibiotic you took and when you started it.

Does a negative result rule out tularemia?

Not if the blood was collected early. Antibodies may not be detectable for two to three weeks after symptoms begin, so a repeat sample or direct test may be needed.

How long can the test stay positive?

Antibodies may remain detectable for years after infection. A positive result does not automatically mean that you currently have active tularemia.

Sources

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