TEST

Joint fluid culture

A joint fluid culture checks fluid from a joint for infection-causing microorganisms

WHAT IT MEASURES
Growth of infection-causing microorganisms in joint fluid

SAMPLE
Joint fluid removed with a needle

FASTING NEEDED?
No, unless sedation or another procedure requires it

HOW LONG IT TAKES
About 10 to 30 minutes

RESULTS IN
Usually 2 to 5 days; longer for some organisms and laboratories

USED FOR
Diagnosis of joint infection

MAIN LIMITATION
Antibiotics before sampling can cause a false-negative result

Overview

A joint fluid culture checks for microorganisms, usually bacteria, in the fluid inside a joint. It may also look for fungi or other unusual organisms when there is a specific reason to suspect them.

Joint fluid is also called synovial fluid. It lubricates joints such as the knee, hip, shoulder, elbow, wrist, and ankle.

The sample is collected through a procedure called joint aspiration, or arthrocentesis. A clinician passes a needle into the joint and removes some fluid. The laboratory places the fluid in conditions that allow microorganisms to grow.

A culture is commonly ordered when a joint infection, called septic arthritis, is possible. Because untreated joint infections can damage the joint, assessment is usually prompt. However, an abnormal-looking joint can have many other causes, including gout, injury, or inflammatory arthritis.

Why the test is ordered

A joint fluid culture may be ordered if a joint becomes painful, swollen, warm, stiff, or difficult to move. Fever or feeling unwell may increase concern about infection, but joint infections do not always cause fever.

The test may also be used when:

Other tests are usually performed on the same fluid. These may include a white blood cell count, a crystal examination for gout or calcium pyrophosphate crystals, and a Gram stain, which is a quick microscopic check for bacteria.

- A joint replacement becomes painful, swollen, or loose
- Symptoms begin after joint surgery, an injection, or an injury
- Infection has spread through the bloodstream
- Joint inflammation has no clear explanation
- Treatment for a known joint infection is not working as expected

Who should have the test

Joint fluid culture is not a routine screening test. It is mainly used when your symptoms, examination, medical history, or imaging suggest that infection needs to be ruled in or out.

Testing may be especially important if you have an artificial joint, a weakened immune system, recent joint surgery, or an infection elsewhere in your body. These factors do not mean that you have a joint infection, but they can affect how urgently it is investigated.

Not every painful joint needs aspiration. Imaging or blood tests may be considered first, particularly if there is little fluid to remove or another cause is more likely.

How to prepare

Fasting is not usually needed for a joint aspiration under local anaesthetic. If sedation or another procedure is planned at the same time, you may receive separate instructions about food and drink.

Tell the healthcare team about:

Do not stop prescribed antibiotics or blood-thinning medicines on your own. When it is safe to do so, clinicians generally try to collect the fluid before antibiotics like amoxicillin or doxycycline are started because antibiotics can reduce the chance of growing the organism.

Wear clothing that allows easy access to the affected joint. No special change to exercise,

coffee, or water intake is usually required.

- Antibiotics or antifungal medicines you are taking or recently finished
- Blood-thinning medicines or a bleeding disorder
- Allergies to local anaesthetics, antiseptics, or dressings
- A joint replacement, recent surgery, or recent joint injection
- Previous infections and recent laboratory results

What happens during the test

You will usually sit or lie in a position that keeps the joint still. The skin is cleaned with an antiseptic. A local anaesthetic may be injected to numb the area.

A needle is then guided into the joint. Ultrasound may be used, especially for deeper joints such as the hip or when the fluid is difficult to locate. Fluid is drawn into a syringe and placed in sterile containers. Some samples are also added to blood culture bottles to help microorganisms grow.

You may feel pressure or brief discomfort. Removing fluid can sometimes reduce tightness caused by a large joint swelling.

The laboratory may examine the fluid immediately and then incubate the culture. Early information may be available before the final culture is complete. Some bacteria, fungi, or other organisms need longer incubation.

Understanding your results

A positive culture means that a microorganism grew from the sample. The report usually names it and may include antibiotic susceptibility results. These show which antibiotics are more or less likely to work in the laboratory.

A positive result does not always prove that the joint is infected. Organisms that normally live on the skin can enter the sample during collection. The type of organism, amount of growth, symptoms, fluid cell count, blood tests, and whether the same organism appears in multiple samples all help determine whether the result represents infection or contamination.

A negative culture means that no microorganism grew under the laboratory conditions used. It lowers the likelihood of infection but does not completely rule it out. Prior antibiotics, a small sample, low numbers of organisms, or bacteria that are difficult to grow can lead to a negative

result despite infection.

There is no single culture result or joint fluid cell count that can be interpreted correctly for everyone. Laboratory methods and interpretation vary with the laboratory, age, sex, pregnancy status, medicines, type of joint, presence of an artificial joint, and overall clinical context.

What affects the results

The most important influence is antimicrobial treatment. Antibiotics or antifungal medicines taken before aspiration can stop or slow growth in the laboratory without having fully cleared an infection.

Results can also be affected by:

The laboratory needs to know if tuberculosis, fungal infection, or another unusual infection is being considered because these may require different containers, tests, or longer incubation.

Food, coffee, exercise, time of day, kidney function, pregnancy, and a recent blood transfusion do not usually change whether organisms grow from joint fluid. Medicines that act against microorganisms are the main medication-related concern.

- Too little fluid being collected
- Delayed transport or storage at the wrong temperature
- Use of containers unsuitable for the suspected organism
- Skin microorganisms entering the sample during collection
- Organisms that grow slowly or need special culture conditions
- A recent joint washout, which can reduce the number of organisms present

Accuracy and limitations

Joint fluid culture is the main test for identifying the organism causing many joint infections, but it does not find every infection. The chance of detection differs according to the organism, sample volume, collection method, previous antibiotics, and whether the joint is natural or artificial. For that reason, one universal accuracy percentage would be misleading.

The test can be wrong in two main ways. It can miss a real infection when no organism grows, or it can suggest infection when a contaminating skin organism grows.

A Gram stain can provide faster information, but it misses more infections than culture. A white blood cell count and crystal examination help identify inflammation or gout, but neither

can reliably exclude infection. Crystals and infection can occur together.

Blood cultures may find an organism when infection has spread through the blood. For suspected gonococcal arthritis, urine or genital molecular tests may be more useful than joint culture. Suspected infection around a joint replacement may require several tissue samples, prolonged incubation, or specialist molecular testing.

Risks and complications

Joint aspiration commonly causes brief pain, mild bleeding, or a bruise. Some people feel faint during needle procedures.

More significant bleeding, infection introduced by the needle, or injury to nearby structures is uncommon. Bleeding risk may be higher with certain blood-thinning medicines or bleeding disorders, which is why the healthcare team needs an up-to-date medication history.

What happens next

Preliminary findings may guide treatment before the final culture is ready. If infection is strongly suspected, treatment may start after fluid and blood samples have been collected rather than waiting for final results.

A positive culture may lead to targeted antibiotic or antifungal treatment. Drainage, repeated aspiration, or surgery may also be considered, particularly for an artificial joint or a large infected joint.

A negative result may be reviewed alongside your symptoms, examination, blood tests, imaging, and other joint fluid findings. If concern remains, clinicians may repeat sampling or request specialist tests.

Contact your healthcare service promptly if swelling, redness, pain, or fever worsens after the procedure. Seek urgent same-day assessment for a new hot, swollen joint, especially with fever or difficulty bearing weight. Call emergency services if you become severely unwell, confused, faint, or have trouble breathing.

Routine follow-up is appropriate when symptoms are stable and you are waiting for a planned review of the final culture.

Common questions

Can I drink coffee before a joint fluid culture?

Usually, yes. Joint aspiration normally does not require fasting. Follow different instructions if you are having sedation or another procedure at the same appointment.

Does the time of day matter?

No. Joint fluid can usually be collected at any time. When infection is suspected, obtaining the sample promptly matters more than the time of day.

Can I exercise beforehand?

Light activity does not usually affect the culture. If the joint is painful or swollen, avoid activity that makes symptoms worse.

Should I stop antibiotics before the test?

Do not stop them without medical advice. Antibiotics can reduce culture growth, but interrupting treatment may be unsafe. Tell the healthcare team exactly what you have taken and when.

Is joint aspiration painful?

You may feel a sting from the local anaesthetic and pressure as the needle enters the joint. Discomfort is usually brief, although a sore spot can remain afterward.

Why is my result taking longer than expected?

Some organisms grow slowly or require special laboratory conditions. Final timing also varies by laboratory and by the type of culture requested.

Sources

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