TEST

Chromium - blood test

A chromium blood test measures chromium exposure or release from some metal implants.

WHAT IT MEASURES
Chromium in the liquid or cellular parts of blood

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
Usually 5 to 10 minutes

RESULTS IN
Often several days; turnaround differs by laboratory

USED FOR
Investigating exposure and monitoring some metal hip implants

MAIN LIMITATION
Contamination and specimen type can mislead interpretation

Overview

A chromium blood test measures chromium in whole blood, serum, or plasma. These specimen types are not interchangeable, so the type tested matters when interpreting the result.

Chromium occurs in several chemical forms. Chromium-3 is found in foods and some supplements. Chromium-6 is mainly associated with industrial processes and can be harmful. Most routine tests measure total chromium and cannot identify which form is present.

Results must be considered alongside the source and timing of exposure, kidney function, supplements, and whether you have a metal implant. This is not a routine screening test. It is usually requested for a specific exposure concern or follow-up of certain metal-on-metal hip implants.

Why the test is ordered

The test may be ordered to investigate:

For workplace exposure to chromium-6, a correctly timed urine test is often more useful because it can better reflect chromium absorbed during a recent shift or working week.

For a metal hip implant, chromium is only one part of the assessment. Symptoms, examination, implant type, changes over time, and imaging may be more important than a single result.

- Workplace exposure, including chrome plating, welding, pigments, or stainless steel
- Significant exposure to chromium-containing dust, fumes, or liquid
- Chromium release from certain metal-on-metal hip implants
- Chromium from supplements, contaminated products, or intravenous nutrition
- An unexpected result on another trace-element test

Who should have the test

Testing may be offered if you have a credible source of chromium exposure, take part in occupational health monitoring, or need specialist follow-up for a metal-on-metal hip implant. Most people with hip replacements do not need this test because many implants do not have metal-on-metal bearing surfaces.

Testing may also be considered if you receive long-term intravenous nutrition or use chromium-containing supplements and excessive intake is suspected.

Chromium blood testing is generally not useful as a wellness test or to investigate vague symptoms without a clear exposure history.

How to prepare

Fasting is not usually needed. Eat and drink normally unless other tests require fasting.

Tell the healthcare professional about:

Do not stop prescribed medicines or supplements unless instructed.

Occupational testing may need to be performed at a specific time during your shift or working week. Follow the laboratory or occupational health instructions.

The sample must be collected in a tube intended for trace-element testing to reduce contamination.

- Chromium or multivitamin supplements
- Intravenous nutrition

- Your job and possible workplace exposure
- Metal implants, including their type and fitting date
- Kidney disease or dialysis
- Recent blood transfusions
- All prescription and non-prescription medicines

What happens during the test

A healthcare professional cleans your skin, usually inside the elbow, and inserts a small needle into a vein. Blood is collected into a special tube. The blood draw usually takes a few minutes.

The laboratory commonly measures chromium using mass spectrometry, which can detect very small amounts of elements. You may also be asked for a urine sample if recent workplace exposure is being investigated.

Understanding your results

Your report should state whether whole blood, serum, or plasma was tested. Compare the result only with the range or decision level supplied for that specimen type.

There is no single chromium range for every person or reason for testing. Interpretation varies with the laboratory, specimen type, kidney function, exposure history, medicines, and clinical context.

A higher result may reflect exposure, chromium released from an implant, reduced kidney clearance, supplements, intravenous nutrition, or contamination during collection. It does not by itself prove chromium poisoning or implant failure.

A low result is rarely useful alone. Blood chromium is not a reliable general test for chromium deficiency.

For metal implants, trends may be more informative than one measurement. A rising level may lead to repeat testing and further assessment, but implant decisions should not be based only on chromium levels.

What affects the results

Because chromium is measured at very low concentrations, contamination from collection

equipment, an unsuitable tube, skin, or laboratory handling can cause an unexpectedly high result.

Other influences include:

Report all medicines and supplements. Ordinary food, coffee, and recent exercise are unlikely to cause a large immediate change, but chromium-containing supplements can matter.

- Specimen type: Whole blood, serum, and plasma use different comparison ranges
- Timing: Levels may fall after a brief exposure or vary with particular work tasks
- Kidney function: Reduced clearance may increase levels or slow their decline
- Dialysis: Treatment can affect trace-element concentrations
- Supplements and nutrition: Chromium supplements and intravenous nutrition can raise results
- Red blood cell damage: This can affect serum or plasma measurements
- Recent transfusion: Donated blood may complicate whole-blood results
- Pregnancy: Changes in blood volume and kidney function may affect interpretation

Accuracy and limitations

Modern methods can measure very small amounts of chromium accurately, but the result may not answer the clinical question.

Contamination or comparison with the wrong specimen range can cause a false high result. An unexpected result may therefore be repeated using careful trace-element collection.

A falsely reassuring result may occur if exposure was brief, intermittent, or happened long before testing. Blood testing can also miss a local problem around an implant. A normal result does not rule out implant wear, soft-tissue damage, or another cause of pain.

Routine testing usually cannot distinguish chromium-3 from chromium-6. Specialised testing is required and is not widely available. For recent occupational chromium-6 exposure, urine testing may be better. For implant concerns, examination and imaging may provide information that blood chromium cannot.

Risks and complications

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

What happens next

A result within the expected range may need no further action if exposure has ended and you are well. Scheduled workplace or implant monitoring may still continue.

An unexpected or raised result is usually reviewed alongside the specimen type, collection method, exposure history, kidney function, and earlier results. Next steps may include a repeat blood test, timed urine test, workplace exposure review, or implant assessment.

Arrange earlier medical advice if you develop persistent hip pain, swelling, reduced movement, skin irritation after exposure, or ongoing breathing or digestive symptoms following a known exposure.

Seek urgent or emergency help after substantial chromium exposure if you have severe trouble breathing, collapse, a serious chemical burn, repeated vomiting, confusion, or very little urine. Do not wait for a chromium test result before getting emergency care.

Common questions

Can I drink coffee before the test?

Usually, yes. Fasting is not normally required. Follow different instructions if other tests are being collected.

Does the time of day matter?

Usually not for implant monitoring. For workplace exposure, timing within your shift or working week may be important.

Can I exercise beforehand?

Normal activity is unlikely to affect the result. Follow any instructions given for other tests.

Should I stop my chromium supplement?

Do not stop it unless instructed. Report the product, dose, and when you last took it.

Why might I need the test repeated?

Repeating the test can check an unexpected result, reduce concern about contamination, or show whether the level is rising or falling.

Can the result tell whether my hip implant needs replacing?

No. Symptoms, examination, imaging, implant design, and changes in metal levels over time are also considered.

Sources

- Agency for Toxic Substances and Disease Registry: Toxicological Profile for Chromium , US Department of Health and Human Services
- US Food and Drug Administration: Information for Orthopaedic Surgeons about Metal-on-Metal Hip Implants
- Medicines and Healthcare products Regulatory Agency: All Metal-on-Metal Hip Replacements-Updated Advice for Follow-up of Patients , Medical Device Alert MDA/2017/018
- Occupational Safety and Health Administration: Hexavalent Chromium , workplace exposure and medical surveillance information
- Mayo Clinic Laboratories: Chromium, Blood , laboratory test information and specimen guidance