TEST

Coombs test

A Coombs test checks for antibodies that may target red blood cells.

WHAT IT MEASURES
Antibodies attached to red cells or circulating in plasma

SAMPLE
Blood

FASTING NEEDED?
No

HOW LONG IT TAKES
About 5 to 10 minutes

RESULTS IN
Same day to several days, depending on laboratory

USED FOR
Diagnosing hemolysis and screening pregnancy or transfusion blood

MAIN LIMITATION
Positive results do not prove red-cell destruction

Overview

A Coombs test looks for antibodies that react with red blood cells. If antibodies attach to these cells, they may be removed from the bloodstream earlier than usual. This is called immune hemolysis .

The preferred medical name is an antiglobulin test . There are two main forms:

These tests answer different questions. A positive result does not by itself prove that red blood cells are being destroyed or identify the cause.

- The direct antiglobulin test (DAT) checks whether antibodies or immune proteins called complement are already attached to your red blood cells.
- The indirect antiglobulin test (IAT) checks plasma for antibodies that could attach to red blood cells. It is commonly used during pregnancy and before transfusion.

Why the test is ordered

A direct Coombs test may be ordered when symptoms or other results suggest that red blood cells are breaking down too quickly. Possible causes include autoimmune hemolytic anemia, a transfusion reaction, certain medicine-related reactions, or blood group incompatibility affecting a newborn.

It is usually interpreted with a complete blood count and tests such as bilirubin, lactate dehydrogenase, haptoglobin, reticulocyte count, and a blood smear.

An indirect Coombs test may be used to:

During pregnancy, some maternal antibodies can cross the placenta and affect the baby's red blood cells. The importance depends on the antibody and the wider pregnancy assessment.

- Screen for red-cell antibodies during pregnancy
- Check compatibility before a transfusion
- Identify an unexpected antibody
- Help select suitable donated blood

Who should have the test

You may have a direct test if symptoms or blood results suggest hemolysis, or if a transfusion reaction is being investigated. A newborn may be tested because of jaundice, anemia, or a known blood group difference between parent and baby.

An indirect test is commonly included in prenatal and pre-transfusion testing. It may be repeated to monitor a previously identified antibody.

The test is used to answer a specific clinical question and is not generally a stand-alone health screening test.

How to prepare

You do not need to fast. You can usually eat, drink water, and have coffee as normal.

Tell the healthcare professional about previous transfusions, pregnancies, known red-cell antibodies, medicines, and recent immune treatments. These details can affect interpretation. Do not stop a prescribed medicine unless the clinician who prescribed it tells you to.

Exercise and time of day do not usually affect the result.

What happens during the test

A healthcare professional cleans the skin and takes a small blood sample, usually from a vein in your arm. The blood draw normally takes a few minutes.

For a direct test, the laboratory washes your red blood cells and adds antiglobulin reagent. Clumping indicates that antibodies or complement are attached to the cells.

For an indirect test, the laboratory mixes your plasma with selected red blood cells. A positive screen may require further testing to identify the antibody and find compatible donor blood.

Careful identity checks are essential before transfusion. You may be asked to confirm your full name and date of birth more than once.

Understanding your results

Results are usually reported as positive or negative. Some laboratories also report reaction strength and whether IgG antibodies, complement, or both were detected.

A positive direct test means immune proteins were found on your red blood cells. It does not prove that the cells are being destroyed. Other blood tests and your clinical condition determine whether hemolysis is occurring.

A negative direct test means the standard method did not detect enough antibody or complement. Immune hemolysis becomes less likely but is not completely excluded.

A positive indirect test means your plasma contains an antibody that can react with certain red blood cells. The laboratory usually identifies it. This helps staff choose compatible blood or plan pregnancy follow-up.

A negative indirect test means no clinically important red-cell antibody was detected by that method at that time.

There is no universal numerical reference range. Interpretation varies with the laboratory method, pregnancy status, medicines, transfusion history, and clinical context.

What affects the results

A recent transfusion may complicate testing because the sample can contain both your red cells and donor cells. Transfusion can also trigger a new antibody that was absent previously.

Pregnancy may lead to antibodies after exposure to fetal red-cell proteins. Anti-D immunoglobulin, used to prevent RhD sensitization, can cause a temporary positive antibody screen because it contains passive anti-D antibodies.

Some medicines, including certain cephalosporin antibiotics, piperacillin, and methyldopa, can cause antibodies to attach to red cells. Intravenous immunoglobulin and some antibody-based treatments may also interfere with testing or cause positive reactions. Do not stop treatment without medical advice.

Autoimmune or inflammatory conditions can produce a positive direct test without active red-cell destruction. Delays, temperature changes, or poor sample quality may also affect testing, so the laboratory may request a fresh sample.

Food, coffee, routine exercise, and time of day have little meaningful effect.

Accuracy and limitations

There is no single accuracy percentage because performance depends on the method, antibody type, and reason for testing.

A direct test can be positive without active hemolysis, including after transfusion or with certain medicines, immune treatments, or illnesses. It can also miss immune hemolysis if only small amounts of antibody are present, antibodies detach during processing, or uncommon antibody types are involved. If suspicion remains high, a specialist laboratory may use enhanced testing or flow cytometry.

An indirect test detects only antibodies that react under the laboratory conditions used. Newly forming antibodies may be too weak to detect, and older antibodies can fade below detectable levels. Previous antibody records therefore remain important even if a later screen is negative.

The test cannot show how quickly red cells are being destroyed. Blood counts and hemolysis markers are needed for that.

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

A negative result may need no further action if other findings are reassuring. If anemia or suspected hemolysis remains unexplained, further tests or specialist assessment may still be needed.

After a positive direct test, follow-up focuses on whether hemolysis is occurring and its possible cause. This may include reviewing medicines, recent transfusions, symptoms, and other laboratory results.

After a positive pregnancy antibody screen, the laboratory identifies the antibody. Routine or specialist follow-up depends on the antibody and its level or strength.

Before transfusion, a positive antibody screen may mean compatible blood takes longer to prepare. This reflects careful matching and does not mean a reaction is occurring.

If you develop fever, chills, back or chest pain, breathing difficulty, faintness, or dark urine during a transfusion, tell staff immediately. After leaving a medical facility, severe breathing difficulty, chest pain, or fainting requires emergency help. Fever, chills, jaundice, or dark urine after a recent transfusion needs urgent medical advice.

Common questions

Can I drink coffee before a Coombs test?

Yes. Fasting is not required unless you have separate instructions for other tests being collected.

Does the time of day matter?

No. The sample can usually be collected whenever the clinic or laboratory is open.

Can I exercise beforehand?

Routine exercise does not meaningfully affect the test, unless another planned test or your health condition requires different preparation.

How long will I wait for the result?

Routine screens may be reported the same day. Antibody identification, complex compatibility testing, or specialist laboratory work can take several days.

Does a positive result mean I have anemia?

No. A positive direct test shows immune proteins on red cells, not whether you have anemia or active red-cell destruction.

Can the result change over time?

Yes. Antibodies may appear after pregnancy or transfusion and later become too weak to detect. Medicines and immune treatments can also cause temporary changes.

Sources

- MedlinePlus Medical Test: Coombs Test , US National Library of Medicine
- Canadian Blood Services: Pre-transfusion testing , Clinical Guide to Transfusion
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- Parker V, Tormey CA. The Direct Antiglobulin Test: Indications, Interpretation, and Pitfalls , Archives of Pathology & Laboratory Medicine , 2017
- Zantek ND, Koepsell SA, Tharp DR, Cohn CS. The direct antiglobulin test: a critical step in the evaluation of hemolysis , American Journal of Hematology , 2012