TEST

Vitamin A blood test

A vitamin A blood test measures retinol to help investigate vitamin A deficiency or excess.

WHAT IT MEASURES
Retinol, the main circulating form of vitamin A

SAMPLE
Blood

FASTING NEEDED?
Sometimes; your laboratory may require an overnight fast

HOW LONG IT TAKES
Usually less than 10 minutes

RESULTS IN
Usually several days; timing varies by laboratory

USED FOR
Investigating deficiency or excess and monitoring treatment

MAIN LIMITATION
Blood retinol poorly reflects vitamin A stored in the liver

Overview

A vitamin A blood test usually measures retinol , the main form of vitamin A circulating in your blood. Most vitamin A is stored in the liver, so the amount in your blood does not always show how much your body has stored.

Vitamin A supports vision, immune function, skin, growth, and reproduction. Your body gets it from foods containing vitamin A or carotenoids, which can be converted into vitamin A. Supplements and some medicines can also provide vitamin A or related compounds.

The test can help investigate possible vitamin A deficiency or excess. It is not usually part of a routine health check. A result needs to be interpreted alongside your symptoms, diet, health conditions, medicines, and sometimes other blood tests.

Why the test is ordered

The test may be ordered when there is concern that you have too little or too much vitamin A.

A low level may be investigated if you have problems with absorbing nutrients, an unusually

restricted diet, or symptoms that could be related to deficiency. These symptoms have many possible causes, so the blood test does not diagnose vitamin A deficiency by itself.

Testing may also be considered when excessive intake is possible, particularly from high-dose supplements or medicines related to vitamin A. Food alone rarely causes vitamin A toxicity, although supplements can contain concentrated amounts.

The test can also be used to monitor treatment for a known deficiency or to check levels in people with an ongoing condition that affects absorption.

Who should have the test

A healthcare professional may suggest testing if you have risk factors such as:

The test is not generally useful for screening people who feel well and have no relevant risk factors. Population-based vitamin A cutoffs also should not automatically be used to diagnose an individual.

Tell your healthcare professional if you are pregnant or could be pregnant and take vitamin A supplements. High doses of preformed vitamin A can harm a developing baby, but you should not stop a prescribed medicine without medical advice.

- A condition that reduces fat absorption, such as pancreatic or intestinal disease
- Previous weight-loss surgery affecting nutrient absorption
- Significant liver disease
- Long-term, very limited food intake
- Use of high-dose vitamin A supplements
- Treatment for an established vitamin A deficiency

How to prepare

Follow the instructions from the laboratory arranging your test. Some laboratories require an overnight fast, while others do not. Fasting can be especially important when the test includes retinyl esters, forms of vitamin A that can rise after a meal.

If you are told to fast, have only plain water during the stated period. Avoid coffee, tea, gum, and other drinks unless the laboratory says they are allowed.

Tell the person arranging the test about:

Do not stop prescribed medicines or supplements unless the clinician who manages them tells

you to. A laboratory may ask you to delay a supplement before testing, but instructions differ.

- Vitamin A, fish liver oil, or multivitamin supplements
- Prescription retinoids, such as medicines used for severe acne
- Other medicines that affect fat absorption
- Recent illness, infection, surgery, or hospital treatment
- Pregnancy or breastfeeding

What happens during the test

A healthcare worker takes a small blood sample, usually from a vein inside your elbow or on the back of your hand. An elastic band may be placed around your upper arm, and the skin is cleaned before a needle is inserted.

The blood draw usually takes a few minutes. The sample may be placed in a light-protected container because vitamin A can break down when exposed to light.

You can normally leave immediately and return to your usual activities.

Understanding your results

Results may be reported as retinol in micrograms per decilitre or micromoles per litre. Use the reference range printed on your own laboratory report rather than comparing your result with a range found online.

Ranges and interpretation vary by laboratory, age, sex, pregnancy status, medicines, and clinical context. The testing method may also affect the result.

A low retinol result can support vitamin A deficiency, especially when it matches your history and other findings. However, blood retinol may remain within range until liver stores are substantially reduced. It can therefore miss an early shortage.

Inflammation or infection can temporarily lower blood retinol even when liver stores are adequate. A low result during an illness may need to be repeated after you recover.

A high result may reflect recent intake, supplements, reduced clearance, or excess vitamin A. Blood retinol alone is not a reliable measure of toxicity because the body controls circulating levels. A clinician may consider retinyl esters, liver tests, kidney tests, supplement use, and symptoms when interpreting it.

What affects the results

Several factors can make the number misleading even when the laboratory has measured the sample correctly.

Recent food intake: A meal, particularly one containing fat or vitamin A, can raise circulating retinyl esters. This is why fasting may be requested when excess intake is being investigated.

Supplements and medicines: Vitamin A, fish liver oil, multivitamins, and prescription retinoids can affect the result. Medicines that reduce fat absorption may lower vitamin A over time.

Infection and inflammation: Illness can reduce retinol and retinol-binding protein, the protein that carries vitamin A in blood. This can produce a low result without proving that liver stores are low.

Liver function: The liver stores vitamin A and makes retinol-binding protein. Liver disease can therefore change the result in ways that do not directly reflect intake.

Kidney function: The kidneys help clear retinol-related proteins. Reduced kidney function can raise circulating retinol or retinol-binding protein.

Nutrition and protein status: Severe protein or zinc deficiency can affect the production or movement of retinol-binding protein, altering blood retinol.

Pregnancy and age: Pregnancy changes blood volume and vitamin transport. Levels and appropriate interpretation can also differ with age.

Sample handling: Vitamin A is sensitive to light. Laboratories protect the sample and may reject one that was not stored or transported correctly.

Accuracy and limitations

The test can correctly identify some cases of established deficiency, but it may miss early deficiency because blood retinol is kept stable while liver stores are being used. It can also suggest deficiency when infection or inflammation has temporarily lowered the level.

A raised blood retinol result does not reliably confirm vitamin A toxicity. Some people with excessive stores may have a retinol result that is not clearly high, while a recent meal or supplement can raise certain forms without established toxicity.

There is no single accuracy figure that applies in every setting. Results are affected by the testing method, the cutoff used, current illness, and the reason for testing.

When the result and clinical picture do not match, repeating a fasting test after an illness has resolved may be more useful. Retinol-binding protein, inflammatory markers, retinyl esters, or

specialist tests of liver vitamin A stores may sometimes add information. Direct measurement from liver tissue is invasive and is not used routinely for this purpose.

Risks and complications

The main risks are a small bruise or short-lived soreness where the needle entered. Some people feel faint during or shortly after a blood draw.

What happens next

A result within your laboratory's range may need no further action if you have no ongoing symptoms or risk factors. It does not always rule out early deficiency, particularly if nutrient absorption remains a concern.

A low or high result is usually reviewed with your diet, supplements, medicines, symptoms, and health conditions. Routine follow-up might include repeating the test, checking inflammation or liver and kidney function, or reviewing supplement intake.

Do not start high-dose vitamin A because of a single low result. Too much preformed vitamin A can be harmful, and the correct treatment depends on why the level is low.

Seek urgent medical advice if you develop severe headache with vision changes, repeated vomiting, marked confusion, or unusual drowsiness after taking a large amount of vitamin A. If a large dose was taken accidentally, contact your local poison service or emergency service. An abnormal laboratory result without severe symptoms usually requires routine follow-up rather than emergency care.

Common questions

Can I drink coffee before the test?

If you were asked to fast, have only plain water. Even black coffee may not meet the laboratory's fasting instructions. If fasting was not requested, coffee is unlikely to be the main influence, but follow your laboratory's directions.

Does the time of day matter?

Time of day is usually less important than fasting status, recent supplements, and current illness. Try to follow any stated appointment time, especially for a repeat test.

Can I exercise beforehand?

Normal activity is unlikely to have a major immediate effect on retinol. Avoid unusually strenuous exercise if the laboratory or clinician has given broader fasting or testing instructions.

Should I stop my vitamin supplements first?

Do not stop prescribed treatment on your own. Tell the person arranging the test exactly what you take and when you last took it. The laboratory may ask you to pause a non-prescribed supplement for a set period.

Can this test prove I have vitamin A deficiency?

Not by itself. A low result can support deficiency, but illness can cause a falsely low result, and early deficiency can be missed. Your history and other tests matter.

How soon can I eat afterward?

You can usually eat immediately after the blood draw. If you tend to feel faint, bring a snack for after the sample has been collected.

Sources

- National Institutes of Health Office of Dietary Supplements - Vitamin A and Carotenoids: Fact Sheet for Health Professionals
- World Health Organization - Serum retinol concentrations for determining the prevalence of vitamin A deficiency in populations
- Mayo Clinic Laboratories - Vitamin A, Serum
- ARUP Laboratories Test Directory - Vitamin A (Retinol), Serum or Plasma
- Tanumihardjo SA - Vitamin A: biomarkers of nutrition for development, American Journal of Clinical Nutrition, 2011