TEST

Total protein

A total protein test measures the combined amount of albumin and globulin proteins in your blood.

WHAT IT MEASURES
Combined albumin and globulin proteins in blood

SAMPLE
Blood from a vein

FASTING NEEDED?
No, unless other ordered tests require it

HOW LONG IT TAKES
Usually less than five minutes

RESULTS IN
Same day to several days; varies by laboratory

USED FOR
Supporting diagnosis and monitoring

MAIN LIMITATION
Hydration and inflammation can change results nonspecifically

Overview

A total protein test measures the combined amount of protein in the liquid part of your blood. It mainly includes two groups of proteins: albumin and globulins.

Albumin helps keep fluid inside blood vessels and carries substances such as hormones and medicines. It is made by the liver. Globulins include antibodies, which help your immune system respond to infection, as well as transport and clotting proteins.

Total protein is often included in a comprehensive metabolic panel, a group of blood tests used to assess general health and organ function. It may also be ordered on its own.

The result shows the overall amount of protein, but it does not show which individual protein caused a change. Some laboratories also report albumin, globulin, or the albumin-to-globulin ratio, often called the A/G ratio.

Why the test is ordered

Your healthcare professional may order total protein to help assess your liver, kidneys, nutrition, or immune system. It can also be used to monitor an existing condition or investigate an unexpected result from another blood test.

The test may be considered when you have concerns such as:

An abnormal total protein result cannot identify the cause by itself. It provides a clue that must be considered with your symptoms, medical history, examination, and other tests.

- Unexplained swelling in your legs or abdomen
- Ongoing tiredness, weakness, or weight loss
- Signs of liver or kidney problems
- Repeated or long-lasting infections
- An unusually high or low albumin result

Who should have the test

There is no need for everyone to have a separate total protein test. It is commonly checked as part of routine blood work or when there is a reason to assess liver, kidney, nutritional, or immune function.

You may also have repeated testing if a previous result was abnormal or if you are being monitored for a condition that can change blood proteins. The timing of repeat testing depends on the reason for the test and whether your other results are stable.

How to prepare

You usually do not need to fast for a total protein test. You may eat and drink normally unless the same blood sample is being used for tests that require fasting, such as certain glucose or lipid tests.

Follow the instructions provided with your appointment. If you were told to fast, ask whether you may drink plain water. Coffee, tea, milk, and sweetened drinks may not be allowed during a fasting period.

Tell the person ordering the test about your medicines and supplements. Do not stop prescribed medicine unless you have been specifically told to do so.

Being normally hydrated can make the result easier to interpret. If you have been given a fluid restriction because of a heart, kidney, or liver condition, continue to follow that advice rather

than drinking extra water for the test.

What happens during the test

A healthcare professional places a small needle into a vein, usually in your arm. Blood is collected into a tube and sent to a laboratory.

The blood draw usually takes less than five minutes, although the full appointment may take longer. Afterward, pressure is applied to the area to reduce bleeding and bruising.

Results may be available the same day or within several days. Timing varies by laboratory and whether other tests were ordered.

Understanding your results

Total protein is usually reported in grams per decilitre or grams per litre. Use the reference range printed with your result rather than comparing it with a range from another laboratory.

Ranges and interpretation vary by laboratory, test method, age, sex, pregnancy status, medicines, and clinical context. A result slightly outside the stated range does not necessarily mean that you have a medical condition.

A high result can occur when there is less water in the blood, such as with dehydration. It can also reflect an increase in antibodies or other globulins caused by inflammation, infection, or certain immune and blood disorders.

A low result may occur when the blood is diluted or when the body makes less protein, loses protein, or does not absorb enough nutrients. Liver conditions, kidney protein loss, digestive problems, and poor nutritional intake are among the possible explanations.

Total protein can be normal even when albumin and globulins are individually abnormal because one may rise while the other falls. Your result may therefore be interpreted alongside albumin, liver tests, kidney function, a blood count, or urine protein testing.

What affects the results

Total protein changes with fluid balance. Dehydration can concentrate the blood and make the result appear high. Large amounts of intravenous fluid can dilute the blood and make it appear low.

Other factors include:

Collection conditions also matter. Keeping a tourniquet tight for too long or repeatedly clenching your fist may concentrate the sample. Standing for a long time before collection can produce a slightly different result from resting.

Visible breakdown of blood cells, very high blood fats, or other sample problems can interfere with some laboratory methods. Laboratories usually identify significant interference and may request another sample.

- Pregnancy: Increased blood volume can lower measured protein concentrations
- Age: Protein patterns can differ between children, adults, and older people
- Kidney function: Protein may be lost in urine when kidney filters are damaged
- Liver function: The liver makes albumin and several globulin proteins
- Inflammation or infection: These can increase certain globulins
- Recent transfusion: Plasma-containing blood products can temporarily affect protein levels
- Intravenous immunoglobulin: This treatment adds concentrated antibodies to the blood
- Medicines: Some medicines affect fluid balance, liver function, or protein production
- Strenuous exercise: Heavy exercise may temporarily shift body fluids or cause dehydration

Accuracy and limitations

Laboratory measurement of total protein is generally reliable when the sample is collected and handled correctly. However, this is a broad test rather than a test for one specific disease.

There is no single rate for how often it misses a condition or gives a misleading positive result. That is because total protein can change for many reasons, and many conditions do not change it at all.

A high or low result can flag a problem when the actual explanation is dehydration, pregnancy, recent intravenous fluids, or another temporary change. Conversely, the result may remain normal when albumin is low but globulins are high.

Total protein can miss an abnormal individual protein. If there is concern about an unusual antibody protein, serum protein electrophoresis separates proteins into groups. Immunofixation or free light-chain testing may provide more detail. Urine protein testing is better for finding protein loss through the kidneys.

Risks and complications

The risks are limited to those of a routine blood draw. You may have brief discomfort, a small bruise, or feel light-headed; serious complications are uncommon.

What happens next

A result within your laboratory's range may need no further action, especially if your other tests are normal.

A mildly abnormal result is often reviewed routinely rather than treated as an emergency. Your healthcare professional may compare it with earlier results, review your fluid intake and medicines, or repeat the test. Additional testing may include albumin, liver and kidney tests, urine protein, or protein electrophoresis.

The total protein number alone does not determine how urgent the situation is. Seek prompt medical help if you develop severe shortness of breath, confusion, fainting, very little urine, or rapidly increasing swelling. Call emergency services for trouble breathing, severe chest pain, or loss of consciousness rather than waiting to discuss a laboratory result.

Common questions

Can I drink coffee before a total protein test?

Total protein alone does not usually require fasting. If other fasting tests are being collected, coffee may not be permitted, even without milk or sugar. Follow the instructions for the full set of tests.

Can I drink water beforehand?

Usually, yes. Normal hydration may help prevent a falsely concentrated result and can make the blood draw easier. Follow any existing medical fluid restriction.

Does the time of day matter?

Time of day usually has little practical effect. Hydration, meals, posture, and recent treatment may matter more. For repeated monitoring, using similar collection conditions can make comparisons easier.

Can I exercise before the test?

Ordinary daily activity is unlikely to cause a meaningful change. Strenuous exercise may alter fluid balance, particularly if it makes you dehydrated. Tell your healthcare professional if you

exercised heavily before the sample.

Do I need to stop my medicines?

Usually not. Some medicines can affect protein levels indirectly, but stopping them without advice may be harmful. Provide an up-to-date list of medicines, supplements, and recent infusions.

Is total protein the same as protein electrophoresis?

No. Total protein measures the combined amount. Protein electrophoresis separates proteins into groups and is used when more detail is needed.

Sources

- MedlinePlus: Total Protein and Albumin/Globulin Ratio , US National Library of Medicine
- Mayo Clinic Laboratories: Total Protein, Serum , test catalogue and interpretation
- Clinical Methods: Serum Albumin and Globulin , US National Center for Biotechnology Information
- American Family Physician: Understanding and Interpreting Serum Protein Electrophoresis , clinical review