TEST

BUN - blood test

A BUN blood test measures nitrogen from urea to help assess kidney function and hydration.

WHAT IT MEASURES
Nitrogen in blood from the waste product urea

SAMPLE
Blood from a vein

FASTING NEEDED?
No, unless combined tests require fasting

HOW LONG IT TAKES
Usually under five minutes

RESULTS IN
Often same day; turnaround varies by laboratory

USED FOR
Checking kidney function, hydration, illness, or treatment

MAIN LIMITATION
Hydration and protein breakdown can change BUN without kidney disease

Overview

A blood urea nitrogen test, shortened to BUN , measures nitrogen in your blood that comes from urea.

Urea is a waste product made when your body breaks down protein. Your liver produces it, and your kidneys filter most of it into urine.

BUN is often included in a basic or comprehensive metabolic panel alongside tests such as creatinine, glucose, and electrolytes. It can provide clues about kidney function and hydration, but it cannot diagnose a kidney condition by itself. Many factors outside the kidneys can change the result.

Why the test is ordered

A BUN test may be ordered to assess how well your kidneys clear waste, evaluate dehydration, or monitor an illness that can affect kidney function.

Common reasons include:

BUN is usually interpreted with creatinine . Creatinine is used to calculate estimated glomerular filtration rate, or eGFR , which is generally more useful for assessing kidney filtration.

A urine albumin test may also be needed to detect protein leaking into urine, sometimes before blood waste levels become abnormal.

- Routine metabolic blood testing
- Symptoms related to kidney or fluid problems
- Diabetes, high blood pressure, heart disease, or another kidney risk factor
- Monitoring kidney disease or medicines that can affect the kidneys
- Checking your condition before surgery or certain treatments
- Evaluating persistent vomiting, diarrhoea, bleeding, or serious illness

Who should have the test

You may have a BUN test as part of routine blood work or to investigate a specific concern. It is not a stand-alone screening test that everyone needs on a fixed schedule.

Testing may be particularly relevant if you have diabetes, high blood pressure, heart failure, reduced kidney function, or an acute illness involving fluid loss. It may also be used when treatment requires kidney monitoring.

Children and pregnant people may have BUN measured when clinically appropriate. Results must be interpreted using suitable laboratory ranges and individual circumstances.

How to prepare

BUN alone does not usually require fasting. Eat and drink normally unless you receive different instructions.

If BUN is part of a panel that includes fasting glucose or cholesterol tests, you may need to avoid food for a set period. Follow the instructions for the complete group of tests.

Drink your usual amount of water unless you have been told to restrict fluids. Drinking much more or less than normal can make the result less representative.

Tell the person ordering the test about prescription medicines, over-the-counter products, and supplements. Do not stop a medicine unless the prescriber tells you to.

When possible, avoid an unusually large high-protein meal or strenuous exercise immediately before testing because both can temporarily affect BUN.

What happens during the test

A healthcare worker places a band around your upper arm, cleans the skin, and inserts a small needle into a vein, usually inside your elbow or on the back of your hand.

Blood is collected into a tube. You may feel a brief scratch or sting. The needle is removed, and pressure or a dressing is applied.

Collection usually takes less than five minutes. You can normally resume your usual activities immediately.

Understanding your results

Your report may show BUN in milligrams per decilitre (mg/dL). Some laboratories report urea in millimoles per litre (mmol/L). These measurements are related but not numerically interchangeable.

Use the reference interval on your report. Ranges vary by laboratory, age, sex, pregnancy status, medicines, and clinical circumstances.

A high BUN can occur when the kidneys are not clearing urea normally. Other causes include dehydration, reduced blood flow to the kidneys, digestive tract bleeding, high protein intake, or increased protein breakdown during illness.

A low BUN may occur with low protein intake, pregnancy, excess body water, or reduced urea production by the liver. A low result alone is often less useful than the overall pattern.

BUN is usually considered alongside creatinine, eGFR, electrolytes, urine tests, symptoms, and previous results. A trend may be more informative than one measurement.

Clinicians sometimes calculate a BUN-to-creatinine ratio. It may suggest dehydration, digestive tract bleeding, or another cause, but it does not confirm a diagnosis.

What affects the results

BUN is influenced by how much urea your body makes and how much water is in your bloodstream.

Important influences include:

Tell your healthcare professional if you were acutely unwell, lost fluid, exercised heavily, changed your diet, or received intravenous fluids before the test.

- Dehydration: Vomiting, diarrhoea, fever, sweating, or limited fluid intake can raise BUN
- Extra fluid: Large amounts of fluid, including intravenous fluids, can lower it
- Protein intake: A high-protein meal may raise BUN; a low-protein diet may lower it
- Digestive tract bleeding: Digested blood may raise BUN
- Protein breakdown: Serious infection, burns, trauma, or strenuous exercise may increase urea production
- Kidney blood flow: Heart failure, severe dehydration, or low blood pressure can raise BUN without permanent kidney damage
- Pregnancy and age: Changes in blood volume, filtration, diet, and kidney function can affect results
- Medicines: Diuretics like furosemide or hydrochlorothiazide , corticosteroids like prednisone or hydrocortisone , some antibiotics like amoxicillin or doxycycline , and medicines affecting kidney function may alter BUN

Accuracy and limitations

Laboratories can measure BUN accurately from a properly collected sample. The main limitation is interpretation.

A high BUN does not prove kidney damage. Dehydration, a high-protein diet, digestive tract bleeding, and increased protein breakdown can raise it when kidney filtration is not the main problem.

BUN can also miss kidney disease. It may remain within range during early kidney damage, particularly when hydration or protein intake lowers urea concentration. A normal result therefore does not rule out kidney disease.

Creatinine-based eGFR is generally better for estimating filtration. Urine albumin testing can detect certain types of kidney damage. In some people, a cystatin C blood test provides additional information when creatinine-based estimates are less reliable.

Results should be interpreted with other blood and urine tests, current health, and previous measurements.

Risks and complications

A blood draw may cause a small bruise, brief soreness, or light-headedness. These effects are usually minor and settle without treatment.

What happens next

If your result is within your laboratory's range and other tests are reassuring, no action beyond routine follow-up may be needed.

An unexpected result may be repeated, especially if dehydration, illness, exercise, or diet could have affected it. Additional testing may include creatinine and eGFR, electrolytes, a urine albumin test, or other tests chosen for your situation.

A mildly abnormal BUN is not usually an emergency by itself. Arrange routine follow-up to discuss it with your healthcare professional.

Seek prompt medical care if an abnormal result occurs with very little urine, persistent vomiting, worsening swelling, marked weakness, or new confusion. Call emergency services for severe breathing difficulty, inability to wake, collapse, or other immediately life-threatening symptoms.

Common questions

Can I drink coffee before a BUN test?

Usually, if BUN is the only test. Coffee can affect hydration and may not be allowed if another test requires fasting. Water is safest when you have fasting instructions.

Do I need to fast?

Not for BUN alone. You may need to fast when it is collected with glucose, cholesterol, or another test with specific preparation requirements.

Does the time of day matter?

BUN does not usually require collection at a particular time. Hydration, meals, illness, and medicines generally matter more.

Can I exercise beforehand?

Ordinary activity is unlikely to cause a major change. Prolonged or strenuous exercise may raise BUN through fluid loss and protein breakdown, so avoid an unusually hard workout when practical.

Does a high BUN mean kidney failure?

No. Possible causes include dehydration and digestive tract bleeding. Kidney function is assessed using the full pattern of blood and urine results.

Can drinking water lower my BUN?

Correcting dehydration may lower a raised BUN. However, excessive water just before testing can dilute the result and may be unsafe if you have been told to limit fluids.

Sources

- MedlinePlus Medical Test: BUN - Blood Urea Nitrogen , U.S. National Library of Medicine
- National Institute of Diabetes and Digestive and Kidney Diseases: Your Kidney Test Results , National Institutes of Health
- National Kidney Foundation: Estimated Glomerular Filtration Rate , National Kidney Foundation
- KDIGO 2024 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease , Kidney Disease: Improving Global Outcomes
- Merck Manual Professional Edition: Evaluation of the Patient With Renal Issues , Merck & Co.