TEST

# Basic metabolic panel

A basic metabolic panel is a blood test that checks blood sugar, electrolytes, calcium, and kidney function.

**WHAT IT MEASURES**
Eight chemicals reflecting blood sugar, electrolytes, calcium, and kidney function

**SAMPLE**
Blood

**FASTING NEEDED?**
Sometimes, when paired with fasting glucose or other tests

**HOW LONG IT TAKES**
Usually less than five minutes

**RESULTS IN**
Same day to several days, varying by laboratory

**USED FOR**
Screening, diagnosis support, and monitoring

**MAIN LIMITATION**
Hydration, medicines, and sample handling can distort individual results

## Overview

A basic metabolic panel, or BMP, is a group of blood tests that provides a snapshot of blood sugar, fluid balance, kidney function, and important minerals.

It usually measures eight substances:

Some laboratories calculate an estimated glomerular filtration rate, or eGFR , from creatinine and information such as age and sex. It is not directly measured by the BMP.

A comprehensive metabolic panel, or CMP, includes the BMP tests plus proteins, liver enzymes, and bilirubin.

- Glucose: the main sugar used by cells for energy
- Calcium: needed for bones, nerves, muscles, and the heart
- Sodium: helps control fluid balance and nerve function
- Potassium: supports muscles, including the heart

- Chloride: helps balance fluids and acids
- Carbon dioxide: mainly bicarbonate, which reflects acid-base balance
- Blood urea nitrogen, or BUN: a waste product affected by kidney function and protein breakdown
- Creatinine: a waste product used to assess kidney filtration

## Why the test is ordered

A BMP may be included in a routine health check or used to investigate symptoms such as unusual thirst, frequent urination, muscle weakness, vomiting, confusion, swelling, or changes in urine output. Because these symptoms have many causes, a BMP cannot diagnose the cause by itself.

It is also used to monitor:

- Kidney function
- Diabetes or high blood sugar
- Fluid loss from vomiting, diarrhea, or poor intake
- Electrolyte changes
- Medicines that affect the kidneys or electrolytes
- Recovery from illness, surgery, or a hospital stay

## Who should have the test

A BMP may be useful when your symptoms, health history, or medicines could affect blood sugar, fluid balance, or kidney function. Examples include diabetes, high blood pressure, heart failure, and kidney disease.

It may also be ordered before surgery or when starting or adjusting medicines such as diuretics or drugs that affect potassium or kidney function.

Not everyone needs regular testing. Timing depends on the reason for the test, your health, medicines, and previous results.

## How to prepare

You usually do not need to fast for a BMP alone. Fasting may be required if the blood draw also includes fasting glucose, cholesterol, or another fasting test.

Follow the instructions on your laboratory request. If fasting is required, check how long to avoid food and whether plain water is allowed. Water is usually acceptable and may make the blood draw easier, but follow your specific directions.

Do not stop prescription medicines or supplements unless the clinician who ordered the test tells you to. Provide an up-to-date list of everything you take.

Tell staff if you have an intravenous, or IV, line. Blood drawn near an infusion may be diluted or contaminated by IV fluid.

## What happens during the test

A healthcare worker cleans the skin, usually inside your elbow, and inserts a small needle into a vein. Blood is collected into one or more tubes.

You may feel a brief sting or pressure. The blood draw commonly takes under five minutes. A dressing is applied afterward, and gentle pressure can help reduce bruising.

## Understanding your results

Your report lists each measurement with the laboratory's reference range. This range reflects results commonly found in a comparison group; it is not a strict boundary between healthy and unhealthy.

Interpretation varies with the laboratory, age, sex, pregnancy, medicines, and clinical context. A mildly high or low result does not always indicate a medical problem.

Results are considered together. For example, BUN and creatinine may be reviewed alongside hydration, urine findings, previous kidney results, and eGFR. Sodium, chloride, and carbon dioxide help describe fluid and acid-base balance.

Glucose must be interpreted according to whether and when you ate and whether you were acutely unwell. A non-fasting glucose result is not equivalent to fasting glucose or HbA1c, which reflects longer-term blood sugar.

Total calcium is affected by blood proteins, especially albumin. If the result does not fit the clinical picture, albumin-adjusted or ionized calcium may be more useful. Changes from your previous results can also matter, even when values remain within range.

## What affects the results

Results may be influenced by:

Collection problems also matter. Fist clenching, a tourniquet left on too long, or damaged blood cells can falsely raise potassium. Delayed processing may alter glucose or carbon dioxide. An unexpected result is often repeated using a fresh sample.

- Hydration: dehydration may raise BUN, creatinine, and sometimes sodium
- Food and drink: meals can raise glucose, while protein may affect BUN
- Exercise: strenuous activity can alter creatinine, potassium, glucose, and acid-base measurements
- Medicines and supplements: diuretics like furosemide or hydrochlorothiazide , steroids like prednisone or hydrocortisone , blood pressure medicines, anti-inflammatory medicines, creatine, potassium, and calcium products may affect results
- Pregnancy, age, and muscle mass: these can change creatinine and its interpretation
- Acute illness or stress: infection, pain, surgery, and emergencies can raise glucose
- Transfusions or IV fluids: these can temporarily change several measurements

## Accuracy and limitations

BMP measurements are generally reliable when the sample is collected and processed correctly. Temporary factors such as dehydration, exercise, meals, or sample damage can still produce abnormal results.

A BMP is only a snapshot. Normal results do not rule out every kidney, hormonal, or metabolic condition, and an abnormal value often cannot identify its cause.

Further testing may include HbA1c for longer-term blood sugar, urine albumin for kidney damage, ionized calcium, or blood gas testing for urgent acid-base concerns. Creatinine and eGFR are also affected by muscle mass, diet, and some medicines; cystatin C may sometimes provide additional information.

## Risks and complications

A blood draw may cause brief discomfort, bruising, light bleeding, or faintness. Serious complications are uncommon.

Tell the person drawing your blood if you have fainted during blood tests before or take medicine that affects bleeding.

## What happens next

If the results are suitable for the reason testing was ordered, no action may be needed beyond routine follow-up. Mild or unexpected changes may be compared with earlier results or repeated.

Follow-up can include another BMP, a urine test, medication review, or more specific blood tests. Do not change your fluids, diet, supplements, or medicines solely because one result is outside the reference range.

A healthcare service may contact you promptly if a result requires same-day assessment. Seek urgent medical advice for persistent vomiting, very little urine, severe weakness, or worsening confusion.

Call emergency services for a seizure, loss of consciousness, severe breathing difficulty, or sudden severe confusion. Do not wait for an online explanation if you have these symptoms.

## Common questions

Can I drink coffee before a basic metabolic panel?

If fasting is required, coffee may not be allowed, even without milk or sugar. Plain water is usually safest. Follow your testing instructions.

Does the time of day matter?

A BMP can usually be collected at any time. Timing may matter when paired with fasting tests, used to monitor medicines, or compared with earlier samples.

Can I exercise beforehand?

Light activity is unlikely to cause a major change. Strenuous exercise can temporarily affect potassium, creatinine, glucose, and carbon dioxide, so avoid it before planned routine testing when possible.

Can I take my medicines before the test?

Usually, yes. Do not skip medicines without specific instructions. Tell the laboratory what medicines and supplements you take.

Is a BMP the same as a CMP?

No. A CMP includes all BMP measurements plus proteins, liver enzymes, and bilirubin.

Why would my BMP need to be repeated?

Repeating the test may confirm an unexpected result, show whether a change was temporary, or replace a sample affected by collection or handling. It does not necessarily mean a serious problem is suspected.

## Sources

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