

# Total and Free Insulin (Blood)



## Does this test have other names?

Serum insulin level

## What is this test?

This blood test measures two types of insulin in your body: total and free.

Insulin is found in your body in many forms. Bound insulin is attached to other proteins. This often happens in people with diabetes who are treated with insulin. Free insulin is not attached to other proteins. Total insulin measures both free and bound insulin.

The hormone insulin plays a key role in keeping your blood sugar at the right level. Too little insulin leads to a certain type of diabetes. High levels of insulin can harm your health by leading to low blood sugar (hypoglycemia).

## Why do I need this test?

You may need this test if you have symptoms of low blood sugar. These symptoms often include:

- Anxiety
- Trembling
- Sweating
- Confusion
- Nausea
- Irritability
- Weakness
- Irregular heartbeat

Hypoglycemia can be caused by:

- Insulin used as a medicine to control diabetes. People with type 1 diabetes are at greater risk for having a serious episode of hypoglycemia. It also can happen in people with type 2 diabetes, but that is much less common.
- Insulinomas. These are rare tumors in the pancreas that produce insulin. They are often not cancer (benign).
- Other types of tumors elsewhere in the body that produce a substance called insulin-like growth factor 2 (IGF-2), which may affect your insulin levels.

## What other tests might I have along with this test?

You may need other blood tests, including those that measure:

- Blood sugar (glucose)

- Proinsulin
- C-peptide
- Cortisol
- Plasma beta-hydroxybutyrate (BHOB)

You may also need a urine test to look at levels of sulfonylurea, a medicine used to treat diabetes.

## What do my test results mean?

Test results may vary depending on your age, gender, health history, and other things. Your test results may be different depending on the lab used. They may not mean you have a problem. Ask your healthcare provider what your test results mean for you.

Results are given in microunits per milliliter (mcU/mL). A normal measurement of free insulin is less than 17 mcU/mL. You may have a false-low result if you have a health problem that's damaging red blood cells.

If your levels are higher, it may mean you have been using too much insulin in medicine form. It may also mean that you have an insulinoma that's making extra insulin.

Your results may be higher or lower if your immune system makes antibodies against insulin.

## How is this test done?

The test is done with a blood sample. A needle is used to draw blood from a vein in your arm or hand.

## Does this test pose any risks?

Having a blood test with a needle carries some risks. These include bleeding, infection, bruising, and feeling lightheaded. When the needle pricks your arm or hand, you may feel a slight sting or pain. Afterward, the site may be sore.

## What might affect my test results?

Taking insulin as a medicine will affect your results.

## How do I get ready for this test?

You may be told to not eat or drink anything but water (called fasting) for a period of time before the test. Tell your healthcare provider if you are taking any medicines that affect your blood sugar, including insulin. Be sure your provider knows about all medicines, herbs, vitamins, and supplements you are taking. This includes medicines that don't need a prescription and any illegal drugs you may use. Also tell your healthcare provider the last time you had something to eat.

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