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Medical Encyclopedia: Insulin test

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Definition

An insulin test is a blood test that measures the amount of insulin, a hormone that regulates blood sugar.

How the test is performed

Blood is drawn from a vein on the inside of the elbow or the back of the hand. The puncture site is cleaned with antiseptic, and an elastic band is placed around the upper arm to apply pressure and restrict blood flow through the vein. This causes veins below the band to fill with blood.

A needle is inserted into the vein, and the blood is collected in an air-tight vial or a syringe. After the blood is drawn, the band is removed to restore circulation. Then, the needle is removed, and the puncture site is covered to stop any bleeding.

For an infant or young child:

The area is cleansed with antiseptic and punctured with a sharp needle or a lancet. The blood may be collected in a pipette (small glass tube), on a slide, onto a test strip, or into a small container. Cotton or a bandage may be applied to the puncture site if there is any continued bleeding.

How to prepare for the test

The preparation depends on the reason for testing your insulin levels. Ask your health care provider if you should fast prior to the test. The health care provider may advise you to withhold medications that can interfere with the test, including injected insulin and/or oral antidiabetic medications.

For infants and children:

The preparation you can provide for this test depends on your child's age and experience. For specific information regarding how you can prepare your child, see the following topics:

- Infant test or procedure preparation (birth to 1 year)
- Toddler test or procedure preparation (1 to 3 years)
- Preschooler test or procedure preparation (3 to 6 years)
- Schoolage test or procedure preparation (6 to 12 years)
- Adolescent test or procedure preparation (12 to 18 years)

How the test will feel

When the needle is inserted to draw blood, some people feel moderate pain, while others feel only a prick or stinging sensation. Afterward, there may be some throbbing.

Why the test is performed

Insulin is a hormone released from the beta cells of the pancreas. Insulin's most important function is to facilitate glucose (blood sugar) uptake by a variety of tissues, especially adipose (fat) and skeletal muscle. Insulin also stimulates the synthesis and storage of triglycerides and proteins. Insulin is the most important regulator of blood glucose. High blood glucose (such as exists shortly after a meal) stimulates the release of insulin, whereas low blood glucose levels inhibit insulin release.

The most important reason for measuring the blood insulin level is the diagnosis or evaluation of hypoglycemia (low blood sugar).

Also, insulin levels measured while fasting can give information about the body's sensitivity to insulin. High insulin, even with normal blood sugar, may indicate that the pancreas is working harder-than-normal to get the blood-sugar level down. This situation is usually caused by the body being resistant to insulin's effect -- a condition called "insulin resistance syndrome" or "metabolic syndrome." It is a very common feature of obesity and of hormonal problems such as polycystic ovary syndrome.

The insulin test may also be combined with other tests, such as glucose, proinsulin, anti-insulin antibodies, and insulin c-peptide for the work-up of hypoglycemia.

Normal Values

5-20 mcU/mL while fasting; normal ranges may differ by the laboratory of the health care provider.

Note: mcU/mL = micro unit per milliliter

What abnormal results mean

Greater-than-normal levels may indicate:

- Insulinoma
- Type 2 diabetes mellitus
- Obesity
- Injection of an excessive amount of insulin
- Sulfonylurea-induced hypoglycemia

Lower-than-normal levels may indicate:

- Diabetes, type 1 or 2

What the risks are

The risks associated with having blood drawn are:

- Bleeding
- Fainting or feeling lightheaded
- Hematoma (blood accumulating under the skin)
- Infection (a slight risk any time the skin is broken)
- Multiple punctures to locate veins

Special considerations

Obesity decreases the sensitivity of various tissues to insulin, which normally results in the pancreas overcompensating and making excess insulin.

Veins and arteries vary in size from one patient to another and from one side of the body to the other. Obtaining a blood sample from some people may be more difficult than from others.

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