

Methods Used to Determine Blood Glucose

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Monitoring blood glucose levels is a normal part of life for people with diabetes. With their disease well managed, they can live long, healthy lives. Unmanaged, however, diabetes can lead to a number of serious complications that includes kidney failure, nerve damage, blindness and even loss of limbs. Fortunately, there are a number of highly effective ways to monitor the body's blood glucose levels.

The Importance of Monitoring Blood Glucose

More than 23 million Americans have diabetes, a serious metabolic disease that prevents the body from using glucose. There are two types of diabetes: type 1 and type 2. In type 1 diabetes, the body does not produce enough insulin. Insulin is a hormone created in the pancreas that affects the way cells use glucose. In type 2 diabetes, the body produces enough insulin, but the cells are resistant to the hormone. With both types of diabetes, the body is unable to process glucose in the blood, which ends up starving the cells and producing dangerously high levels of blood glucose.

The good news is that there are a number of effective treatments for diabetes that includes diet, [exercise](#) and prescription medications. How each of these are used to treat diabetes depends on the type of diabetes and the individual's unique situation.

Monitoring Daily Glucose Levels

When someone is suspected of being diabetic or prediabetic, the individual's physician will usually order a [fasting blood test](#) that targets glucose levels. If the test indicates glucose levels that are higher than the normal range of 70 to 130 mg/dl, an oral glucose tolerance test (OGTT) may be ordered.

During an OGTT, the patient will be instructed to drink a highly concentrated glucose beverage. The blood is then drawn at 30- to 60-minute intervals for up to two hours. A physician will determine whether the glucose levels fall within the normal range. A blood glucose level that remains higher than 200 mg/dl during the test indicates diabetes.

Once a diagnosis has been made, patients are instructed to use a home glucose monitor. The monitor allows them to test their blood several times a day without the cost of expensive laboratory tests. Glucose monitors come in hundreds of designs, are easy to use and produce reasonably valid results.

The patient lances a fingertip or other part of the body and places a small drop of blood on a test strip. The test strip is inserted into the monitor and the results are recorded. It's a good idea for patients to calibrate their monitors against the laboratory results and to record these figures in a notebook so that they can share the results with their physicians.

Long-Term Glucose Management

While fasting glucose, oral glucose tolerance tests, and home glucose monitors are good indicators of blood glucose levels on the day that the patient is tested, the results are not necessarily accurate in diagnosing diabetes. Another

test, called a hemoglobin A1c (also called HbA1c or glycosylated hemoglobin) is the best indicator of glucose intolerance over an extended period of time. HbA1c is a measurement of the percentage of hemoglobin in the red blood cells that is bound to glucose for the life span of the red blood cells --- approximately 120 days. Glucose competes with the same hemoglobin that carries oxygen to cells, so a HbA1c test is a good indicator of long-term glucose management and how it is affecting the cells of the body. The normal percentage of HbA1c is less than 7 percent of the total hemoglobin. To measure HbA1c, a small amount of blood is taken from the patient and tested. The test is usually repeated every three to six months to determine how well the patient is managing the disease and whether changes in medication, diet or exercise are warranted.