**Glycohemoglobin**
*(Hemoglobin A1c; HbA1c; Glycosylated Hemoglobin; Hemoglobin—Glycosylated; A1C; GHb; Diabetic Control Index)*

Pronounced: glih-ko-HEE-moh-gloh-bin

**What Is Glycohemoglobin?**

Glycohemoglobin is a combination of glucose and the protein hemoglobin A found in red blood cells. Hemoglobin A is a protein that carries oxygen to the red blood cells. Glucose is the simple sugar found in cells. When the glucose in cells binds to the hemoglobin protein in red blood cells, glycohemoglobin is formed.

Glycohemoglobin remains in the red blood cells until the cells die, which takes about 120 days. The more glucose in the blood, the more glycohemoglobin is formed and carried by red blood cells. Therefore, glycohemoglobin is a good indicator of the average blood glucose levels over the previous 1-3 months.

**Reason for the Test**

A glycohemoglobin test, commonly called an A1c test, may be used to screen for and make a diagnosis of diabetes. It is also done regularly on people with suspected or confirmed diabetes to check their overall blood sugar control. While people with diabetes may check their blood glucose levels several times a day, an A1c test will tell a doctor how well the person has been doing over the past 1-3 months. Based on the results, the doctor may change the person's diet, exercise routine, or medications.

For people who are newly diagnosed, an A1c test may be done frequently to monitor the long-term trend of blood glucose levels and to be sure that the prescribed treatments are working effectively. For people who are already receiving treatment for diabetes, an A1c test may be ordered several times a year to monitor how well normal glucose levels are being maintained.

**Type of Sample Taken**

A blood sample will be taken from a vein in the arm or the back of the hand, or a small drop of blood will be taken from a fingerstick.
**Prior to Collecting the Sample**

You do not need to make any special preparations or restrictions in diet or activity unless otherwise requested by your doctor. At times, your doctor may require a fasting A1c test, which would require you to restrict food and drink for a period of time prior to the test.

**During the Sample Collection**

A blood sample is often collected from a vein in the arm. You will be asked to sit. An area inside your elbow will be cleaned with an antiseptic wipe. A large band will be tied around your arm. The needle will then be inserted into a vein. A tube will collect the blood from the needle. The band on your arm will be removed. After all the blood is collected, the needle will be removed. Some gauze will be placed over the site to help stop bleeding. You may also be given a bandage to place over the site. The process takes about 5-10 minutes.

**After Collecting the Sample**

After the blood sample is collected, you may need to stay seated for 10-15 minutes. If you are lightheaded, you may need to stay seated longer. Once you feel better, you can leave.

In some cases, a bit of blood may ooze from the vein beneath the skin and cause a bruise. The risk of bruising can be minimized by placing firm pressure over the puncture site. A bruise will usually resolve in a day or two.

After the sample has been taken, you may have redness, swelling, persistent bleeding, or pain. Call your doctor right away if you have any of these complications.

**Results**

You should have your A1c test results within half an hour.

A normal A1c level is 4%-5.5%. Over 6.5% indicates diabetes. A level between 5.6% and 6.4% may indicate prediabetes. Your doctor may want to confirm a normal A1c test with a fasting glucose test.

Diseases or conditions associated with an **elevated HbA1c**:

- Aspirin and other medications to control high cholesterol
- High bilirubin level
- Increased triglycerides
- Splenectomy
- Iron-deficiency anemia
- Chronic renal failure
- Other conditions

Diseases or conditions associated with a **low HbA1c**:

- Overdose with vitamin C or E
- Pregnancy
- Transfusion
- Blood loss
- Hemolytic anemia
Conditions involving abnormal hemoglobins (hemoglobinopathies) may also affect the results.

Since these above conditions may affect your test results, another type of test will need to be used.

Many factors can affect the reliability of lab tests. A test may suggest an illness that actually does not exist. This called a false positive. A test may also miss an illness that actually does exist. This is called a false negative.

A doctor will consider the results from many tests and your symptoms before making a diagnosis. It is important to discuss these results with your doctor before making any conclusions.

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