



# Patient education: Hemoglobin A1C tests (The Basics)

Written by the doctors and editors at UpToDate

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## What is hemoglobin A1C?

This is a blood test that shows what your average blood sugar level has been for the past 2 to 3 months. Doctors and nurses use this test for 2 reasons:

- To see whether you have diabetes
- To see whether diabetes treatment is working the right way

Other names for hemoglobin A1C are "glycated hemoglobin," "HbA1C," or just "A1C."

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## How does A1C relate to my blood sugar?

The table shows how your A1C numbers relate to your actual blood sugar level ( [table 1](#) ).

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## What should my A1C numbers be?

That depends on why you have the test.

- **When checking for diabetes** – If you had an A1C test to see if you have diabetes, an A1C of 5.6 or less is in the normal range.
  - If your A1C is 6.5 or higher, it probably means that you have diabetes, but you should have the test done again to be sure.
  - If your A1C is between 5.7 and 6.4, doctors call this "prediabetes." It means that you are at higher risk for getting diabetes. Certain lifestyle changes can help prevent diabetes. These can include being more active, making changes to your diet, and losing weight (if needed).
- **When checking how treatment is working** – If you already know that you have diabetes, and you had an A1C test to see how well your blood sugar is managed, your A1C should probably be 7 or less. If you are older than 65 years or have other medical

conditions, your A1C goal might be higher. But check with your doctor for what your level should be. Not everyone with diabetes is the same. Some people need to aim for different A1C levels than others.

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## Can I do this test at home?

It is possible to buy kits to test your A1C at home. But home testing of A1C is not usually necessary.

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## How often should I have an A1C test?

That depends on whether you have diabetes and what your last A1C test showed.

- If you had an A1C test to check for diabetes and your A1C was less than 5.7 (meaning that you do **not** have diabetes or prediabetes), you generally should have A1C tests done every 3 years.
  - If you had an A1C test to check for diabetes and your A1C was between 5.7 and 6.4 (meaning that you have prediabetes), you should have A1C tests about once a year. Your doctor or nurse will tell you how often to be tested.
  - If you do have diabetes and your blood sugar is at goal, you should have A1C tests every 6 months.
  - If you have diabetes and you recently changed treatment plans or your blood sugar is not at goal, you should have A1C tests every 3 months.
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## Why do my A1C numbers matter?

Studies show that keeping A1C numbers at goal helps keep people from getting:

- Diabetic retinopathy, an eye disease that can cause blindness
- Nerve damage caused by diabetes (also called "neuropathy")
- Kidney disease

Keeping your A1C at goal might also help prevent future heart attack or stroke, but this is less certain.

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## Should I still measure my blood sugar at home?

If your doctor wants you to check your blood sugar at home, keep doing so even if you have routine A1C tests. Blood sugar tests tell you what your blood sugar is from moment to moment. That's important information, because it lets you know if your medicines and lifestyle changes are keeping your blood sugar in your goal range.

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## More on this topic

Patient education: The ABCs of diabetes (The Basics)

Patient education: Type 1 diabetes (The Basics)

Patient education: Type 2 diabetes (The Basics)

Patient education: Treatment for type 2 diabetes (The Basics)

Patient education: Using insulin (The Basics)

Patient education: Diabetic retinopathy (The Basics)

Patient education: Nerve damage caused by diabetes (The Basics)

Patient education: Chronic kidney disease (The Basics)

Patient education: Managing blood sugar in children with diabetes (The Basics)

Patient education: Checking your child's blood sugar level (The Basics)

Patient education: Type 1 diabetes: Overview (Beyond the Basics)

Patient education: Type 2 diabetes: Overview (Beyond the Basics)

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## Topic 16106 Version 13.0

## GRAPHICS

### A1C level and average blood sugar

If your A1C level is (percent):	That means your average blood sugar level during the past 2 to 3 months was about:	
	If you live <i>in the US</i> , use these values. Your blood sugar is measured in milligrams/deciliter (mg/dL).	If you live <i>outside the US</i> , use these values. Your blood sugar is measured in millimoles/liter (mmol/L).
5	97	5.4
6	126	7
7	154	8.6
8	183	10.2
9	212	11.8
10	240	13.3
11	269	15
12	298	16.5
13	326	18.1
14	355	19.7

The A1C blood test tells you what your average blood sugar level has been for the past 2 to 3 months. This table lists which A1C levels go with which average blood sugar levels. Blood sugar is measured differently in the US than it is in most other countries. The column in the middle is for people in the US. The column on the right is for people who live outside the US.

A1C: glycated hemoglobin.

Graphic 76310 Version 5.0

