



# Type 2 Diabetes and A1c

## What is diabetes?

Diabetes is a disease caused by too little of the hormone insulin or poor use of the body's insulin. Insulin helps your body use and store glucose (sugar) that comes from food. If insulin levels are low or not working well, glucose builds up in your blood. This causes diabetes and can lead to many problems.

In type 1 diabetes, the body cannot make insulin. In type 2 diabetes, the body does not make enough insulin or use the insulin well enough to keep the body working well. Most people with diabetes have type 2 diabetes. Many don't know they have it.

Type 2 diabetes is usually associated with obesity.

## Complications of type 2 diabetes

People with diabetes are at risk for having serious problems (complications). If your blood sugar level stays too high for too long, complications begin and include:

- Blindness
- Kidney disease and failure
- Nerve damage and loss of toes/fingers/legs
- Heart attack and stroke

Many people can control their disease with diet, exercise, and drugs, if needed. Several types of diabetes medications help to improve blood glucose levels for people with type 2 diabetes. Some people with type 2 diabetes may have to take insulin shots so they get enough insulin. You will need to have your blood tested to learn how well you are controlling your disease. The test used to measure your control over time is the hemoglobin A1c test (A1c).

## What is the difference between measuring blood glucose and A1c?

Testing for blood glucose daily tells the level of glucose in your blood at that moment. These levels change all day depending on what and when you eat, whether or not you exercise, and which drugs that you may be taking. A1c, however, tells information on your glucose control over the past 8–12 weeks.

## How often should my A1c level be measured?

A1c is measured by a simple blood test performed in a laboratory. The American Diabetes Association recommends that you have your A1c measured four times a year. You can

have the test less often if you are controlling your diabetes without drugs.

## Keep your A1c as low as you can

People with diabetes should keep their A1c result at 7% (about 170 mg/dL or less). An average blood glucose for a person *without* diabetes is 4–6% (about 65–135 mg/dL).

## What should you do with this information?

The Hormone Foundation recommends that you talk with your doctor if you think you have diabetes. Share your medical and family history, so you can get the best treatment plan for you. The Hormone Foundation also recommends eating well, losing weight if needed, exercising, drinking less alcohol and not smoking.

## Resources

Find-an-Endocrinologist:  
[www.hormone.org](http://www.hormone.org) or call  
1-800-HORMONE (1-800-467-6663)

American Association of Diabetes  
Educators: [www.diabetesnet.com](http://www.diabetesnet.com)

American Diabetes Association:  
[www.diabetes.org](http://www.diabetes.org)

Diabetes Action Research and Education  
Foundation: [www.diabetesaction.org](http://www.diabetesaction.org)

Joslin Diabetes Center: [www.joslin.org](http://www.joslin.org)

National Diabetes Information  
Clearinghouse (NIDDK/NIH):  
Phone: 1-800-860-8747;  
Web: [www.niddk.nih.gov/health/diabetes/ndic.htm](http://www.niddk.nih.gov/health/diabetes/ndic.htm)

<i>If your A1c result is:</i>	<i>Then your daily average blood glucose is around: (in mg/dL)</i>
12.0% . . . . .	345
11.0% . . . . .	310
10.0% . . . . .	275
9.0% . . . . .	240
8.0% . . . . .	205

## Target area for people with diabetes

7.0% . . . . .	170
6.0% . . . . .	135
5.0% . . . . .	100
4.0% . . . . .	65

Source: Adapted from "About Diabetes" (<http://diabetes.about.com/library/blforms/blA1ccalc.htm>), which was adapted from *Diabetes Care* 25:275–278, 2002.

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