

# Diabetes testing

## Why get tested?

To monitor your diabetes and to help your health care provider make treatment decisions

## When to get tested?

- When first diagnosed with diabetes and then two to four times per year
- At least two times a year in patients who are meeting treatment goals (and who have stable glycemic control)
- Four times per year in patients whose therapy has changed or who are not meeting glycemic goals
- When someone is first diagnosed with diabetes the A1C may be ordered more often while control is being achieved

## What kind of sample is needed?

- A blood sample is drawn from a vein in the arm or from a fingertip.
- You do not have to fast for this test.

An A1C test is also known as:

- A1C
- Hemoglobin A1c
- HbA1c
- Glycohemoglobin
- Glycated hemoglobin
- Glycosylated hemoglobin

## A guide to help you reach your A1C goals:

| A1C% | eAG<br>(Estimated Average Glucose*)<br>mg/dl | **ADA Goal   | ***AACE Goal    | Normal blood glucose levels |
|------|--|--------------|-----------------|-----------------------------|
| 15.0 | 384  |              |                 |                             |
| 14.0 | 355  |              |                 |                             |
| 13.0 | 326  |              |                 |                             |
| 12.0 | 298  |              |                 |                             |
| 11.0 | 269  |              |                 |                             |
| 10.0 | 240  |              |                 |                             |
| 9.0  | 212  |              |                 |                             |
| 8.0  | 183  |              |                 |                             |
| 7.0  | 154  | ADA Goal <7% |                 |                             |
| 6.5  | 140  |              | AACE Goal <6.5% |                             |
| 6.0  | 126  |              |                 |                             |
| 5.7  | 117  |              |                 |                             |
| <5.7 | <117   |              |                 | Normal <5.7%                |

\* The relationship between A1C and eAG is described by the formula  $28.7 \times A1C - 46.7 = eAG$ .

\*\* ADA is the American Diabetes Association

\*\*\* AACE is the American Academy of Clinical Endocrinology (doctors who specialize in diabetes, thyroid problems, etc.)

## What is being tested?

The A1C test evaluates the average amount of glucose (sugar) in the blood over the last two to four months. It does this by measuring the concentration of glycosylated hemoglobin. As glucose circulates in the blood, some of it spontaneously binds to hemoglobin A (the primary form of hemoglobin in adults). Hemoglobin is a red protein that carries oxygen in the red blood cells (RBCs). Once the glucose is bound to the hemoglobin A, it remains there for the life of the red blood cell (about 120 days). The more glucose that is in the blood, the more that binds to hemoglobin A. This combination of glucose and hemoglobin A is called A1C (or hemoglobin A1C or glycohemoglobin). A1C levels do not change quickly but will shift as older RBCs die and younger ones take their place.

## How is it used?

The A1C test is used to monitor the overall glucose (sugar) control of diabetes over time. It gives a picture of the average amount of glucose in the blood over the last few months. It can help you and your doctor know if the measures you are taking to control your diabetes are successful or need to be adjusted. The goal is to help you keep your blood glucose levels as close to normal as possible. Keeping blood glucose levels as normal as possible helps to minimize the complications caused by chronically elevated glucose levels, such as progressive damage to body organs like the cardiovascular system, nerves, kidneys, and eyes. However, there are also concerns that with age, certain medications and/or additional health problems, blood sugars that go too low can cause other problems like falls. It's a real balancing act and the same A1C goal will not work for everyone; partner with your doctor to determine your individual goal.



## Is there anything else I should know?

- Remember, the estimated Average Glucose (eAG) is just that – estimated. The exact value reported on your laboratory report may not coincide exactly with the formula on the front.
- The A1C test will not reflect temporary, acute blood glucose increases or decreases.
- If you have an abnormal type of hemoglobin, such as sickle cell hemoglobin, you may have a decreased amount of hemoglobin A. This will affect the amount of glucose that can bind to your hemoglobin and may limit the usefulness of the A1C test in monitoring your diabetes.

## What causes false readings?

False A1C results may also occur in people with other problems that affect their blood or hemoglobin. For example, a falsely low A1C result can occur in people with:

- anemia
- heavy bleeding
- very low iron, for example, those with iron deficiency anemia

Other causes of false A1C results include:

- kidney failure
- liver disease

If you are a MESSA member and would like more information on managing diabetes or would like a copy of our diabetes education handbook, *A Handbook for Partnering with Your Physician*, call 800.336.0022 and select prompt 3.