

## HBA1C TESTS

### Introduction:

HbA1c, or glycated hemoglobin, develops when the hemoglobin [a protein within red blood cells that carries oxygen throughout the body] joins with glucose in the blood, becoming 'glycated'. When the body processes sugar, or glucose, it naturally attaches to hemoglobin. The amount of glucose that combines with this protein is directly proportional to the total amount of glucose that is in your system. The life of red blood cells in the human body range between 8-12 weeks before renewal. Measuring glycated hemoglobin (or HbA1c) can be used to reflect average blood glucose levels over that period, providing a useful tool for assessing blood glucose control.

### When is it ordered?

HbA1c is routinely checked in people with diabetes as directed by the doctor. HbA1C may also be ordered as part of a health checkup or when someone is suspected of having diabetes.

Signs or symptoms of increased blood glucose levels include:

- Increased thirst and drinking fluids,
- Increased urination.
- Increased appetite.
- Fatigue.
- Blurred vision.
- Slow-healing infections.

## What are the benefits of lowering HbA1c?

Studies have shown that improving HbA1c by 1% (or 11 mmol/mol) for people with type 1 diabetes or type 2 diabetes decreases the risk of microvascular complications by 25%.

Microvascular complications include:

- Retinopathy (Damage to the retina at the back of the eyes).
- Neuropathy (Nerve damage).
- Diabetic nephropathy (kidney disease)

## Specimen/Sample Type:

- Blood.
- Fasting is not required.

## Interpretation of the Test Results:

HbA1c	mmol/mol	%
<b>Normal</b>	Below 42 mmol/mol	Below 6.0%
<b>Prediabetes</b>	42 to 47 mmol/mol	6.0% to 6.4%
<b>Diabetes</b>	48 mmol/mol or over	6.5% or over

## Limitations of HbA1c tests:

The HbA1c test should not be used for:

- Screening for cystic fibrosis-related diabetes.
- Diagnosis of gestational diabetes in pregnant women.
- People who have had recent severe bleeding or blood transfusions.
- People with chronic kidney disease or liver disease.
- People with blood disorders such as iron-deficiency anemia and vitamin B12 deficiency anemia.
- Individuals with some hemoglobin variants (e.g., sickle cell disease or thalassemia).

## References:

- <https://www.diabetes.org/diabetes/treatment-care> American diabetes association.
- <https://www.diabetes.org.uk/professionals/conferences>
- <https://labtestsonline.org/>