

GLYCOSYLATED HAEMOGLOBIN (HbA1c)

Glycosylated Haemoglobin (HbA1c) levels are routinely measured in conjunction with fasting glucose and fasting Insulin in monitoring people with diabetes. Haemoglobin A1c (HbA1c) is a glycated form of haemoglobin, the oxygen-carrying pigment that gives blood its red colour, in red blood cells that results from the binding of haemoglobin in red blood cells to glucose in the bloodstream. When haemoglobin is bound to glucose, it remains glycated, also sometimes referred to as glycosylated or glycosylated haemoglobin or glycohaemoglobin.

Why measure HbA1c?

HbA1c reflects average glycaemia over the preceding 6–8 weeks. As red blood cells have an average lifespan of 120 days, HbA1C reflects exposure of red blood cells to glucose over this time period. It is for this reason that HbA1c can reflect impaired glucose tolerance even when fasting plasma glucose levels are normal.

Levels of HbA1c are not influenced by daily fluctuations in the blood glucose concentration but reflect the average glucose levels over the past 3 months. HbA1c is a useful indicator of how well the blood glucose level has been controlled and may be used to monitor the effects of diet, lifestyle and medication therapy on blood glucose in people with diabetes.

The Service Incentive Program for diabetes care recommends is to measure HbA1c every 3-6 months; optimum levels are 3.5 - 5.5%. Levels of HbA1c above 6% in diabetics are associated with an increased risk of developing complications such as eye, kidney and heart disease, nerve damage, and stroke. HbA1c levels above 6% can predict cardiovascular disease and type 2 diabetes in high-risk individuals.

About 90% of haemoglobin is haemoglobin A (the 'A' or adult type) but approximately 8% of haemoglobin A is made up of minor components that are chemically slightly different. These minor components include haemoglobin A1c, A1b, A1a1 and A1a2. Haemoglobin A1c (HbA1c) is a minor component of haemoglobin to which glucose is bound.

SIGNS & SYMPTOMS OF GLUCOSE INTOLERANCE OR DIABETES

Unexplained weakness and fatigue	Excessive thirst and/or hunger
Weight loss	Frequent urination including bedwetting
Blurred vision	Numbness and tingling in the feet or legs
Recurrent infections	Slow wound healing

What do the results mean?

Changes in the level of HbA1c reflect changes in average glycaemia and the effect of hypoglycaemic intervention.

The HbA1c reflects the average glycaemic exposure that changes the risk of microvascular complications (retinopathy, nephropathy and neuropathy) increasing risk by approximately 30% for each 1% increase in the HbA1c level. The relationship between the onset and progression of microvascular complications is curvilinear, flattening as the HbA1c percentage decreases as reported by RACGP. (*Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin—dependent diabetes mellitus. N Engl J Med 1993 329:977–86.*)

Predisposing factors

- Genetics – a strong family history of diabetes is a major risk factor for high levels of insulin resistance
- Too much food - particularly high GI carbohydrates including excessive alcohol consumption
- Lack of regular aerobic and anaerobic exercise
- Stress – high cortisol will oppose effects of insulin
- Nutritional deficiencies – particularly chromium, vanadium, magnesium and copper

HbA1c BLOOD SPOT [Test code: 1411]

- ❖ HbA1C (Glycosylated haemoglobin)

Other blood sugar tests:

- Fasting Glucose
- **Insulin [6008]:** Fasting Insulin
- **HbA1c (blood) [6006]:** HbA1c (glycosylated haemoglobin)
- **Insulin Resistance Index (blood) [1109]:** Fasting glucose, insulin, HOMA-IR score

How to order a test kit:

To order a test kit simply request the test name and/or test code on a NutriPATH request form test code and have the patient phone NutriPATH Customer Service on 1300 688 522.



Phone 1300 688 522 for further details
www.nutripath.com.au