

AUSTRALIAN
Clinicallabs

HbA_{1c} (Diabetes)





How is diabetes diagnosed?

Diabetes is diagnosed either by measurement of either HbA1c or glucose in blood.



How does the HbA1c test work?

The HbA1c test is able to identify diabetes and monitor blood glucose levels in diabetic patients. As glucose circulates in your blood, some of it slowly binds to haemoglobin (the protein that carries oxygen in your red blood cells). This combination is called haemoglobin A1c (HbA1c). The amount of HbA1c formed is directly related to the amount of glucose in your blood.

If diabetes is not well controlled, blood glucose levels are high, causing elevated HbA1c levels. The HbA1c remains in the red cells of the blood until they are removed from the body which takes about 3 months. The amount of HbA1c in your blood reflects the average amount of glucose in your blood during the last few months.

No preparation is required for your HbA1c test and it can be performed at any time of day. Blood is drawn from the arm and HbA1c levels are then analysed. Patients who are diagnosed with diabetes must come back every 3-6 months for further tests to monitor HbA1c levels.



What is diabetes?

Diabetes is a condition in which the level of glucose (sugar) in an individual's blood becomes too high because the body cannot use it properly.

Insulin controls the movement of glucose into most of the body's cells and maintains blood glucose levels within a narrow range. Most tissues in the body rely on glucose for essential energy production.

In diabetes there is disruption between the normal balance of insulin and glucose. Usually after a meal, carbohydrates are broken down into glucose and other simple sugars, stimulating the release of insulin into the bloodstream. If there is insufficient or ineffective insulin, glucose levels remain high and the body's cells 'starve'.

This can cause both short term and long term problems. In the short term it can cause dehydration by upsetting the body's electrolyte balance. If unchecked, this can eventually lead to much more serious issues such as kidney failure. Over time, high glucose levels can damage blood vessels, nerves and organs throughout the body, contributing to other problems such as high blood pressure and heart disease.



Different types of diabetes

There are two main types of diabetes:

Type 1

Type 1 diabetes is present in about 0.5% of the population in Australia, with most cases diagnosed in those under the age of 30. Type 1 diabetics make very little or no insulin with most entirely reliant on insulin injections.

Type 2 diabetes is estimated to be present in over 5% of the population of Australia but unfortunately only about half of those know they have the condition.

Type 2 diabetics do make their own insulin but it is not enough to meet their needs because their body has become resistant to its effects. It generally occurs later in life, in those who are obese, sedentary and over 45 years of age.

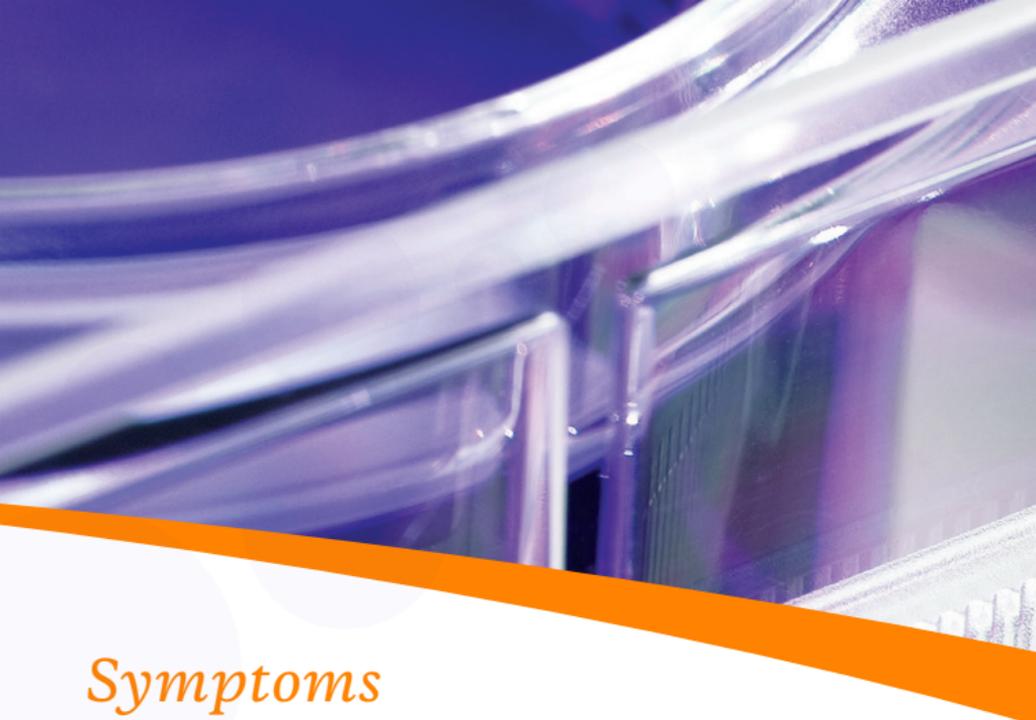
Type 2



How do you get diabetes?

The exact cause of type 1 diabetes is unknown, but a family history of diabetes and viruses that injure the pancreas are thought to play a part. Type 1 diabetics may have more severe medical complications than those with other forms of diabetes, such as serious kidney problems.

Risk factors for type 2 diabetes include carrying excess weight and lack of exercise. The number of Australians, especially younger people, developing type 2 diabetes is rapidly rising. You can greatly decrease your risk of developing type 2 diabetes by losing excess weight, eating a healthy diet and exercising regularly. Other risk factors include high blood pressure or high cholesterol, as well as a family history of diabetes.



Symptoms

Symptoms of type 1 diabetes often develop abruptly and the diagnosis is often made following an emergency admission to hospital. The patient may be seriously ill, even unconscious, with very high glucose levels.

At the time of type 2 diagnosis, the patient may have typical symptoms of diabetes, especially thirst, weight loss or may be passing large amounts of urine, or they may not have any symptoms at all.

Symptoms of type 1 and type 2 diabetes with hyperglycaemia may include any of:

- Increased thirst
- Passing increasing amounts of urine
- Increased appetite (can also be weight loss for type 1)
- Tiredness
- Feeling sick
- Vomiting
- Stomach pain (especially in children)
- Blurred vision
- Slow-healing infections
- Numbness, tingling and pain in the feet
- Erectile dysfunction
- Absence of menstruation
- Rapid breathing (acute)
- Decreased consciousness, coma (acute)

Treatment and retesting

The goals of diabetes treatment are to keep glucose levels close to normal and to treat any progressive vascular disease or organ damage. Diabetic treatment at the time of diagnosis may vary. Type 1 diabetics may be diagnosed following a short term illness and require expert care to get the body back to its normal balance. Type 2 diabetics may occasionally be sick in a similar way to that described for type 1 diabetics. This may occur if they have ignored initial symptoms, neglected their regular treatment, or if they have a serious stress to their system such as a heart attack or infection.

Diabetic patients can monitor their condition by measuring their own blood glucose levels. However, this is recommended only for type 1 diabetes or people with type 2 diabetes who are on insulin injections. Regular home blood measurements are taken, in combination with monitoring tests completed by your doctor. Regular exercise and following a healthy diet is also strongly recommended.

Type 2 diabetics usually monitor their condition through having regular HbA1c tests. Type 2 diabetics range from those who can control their glucose levels with diet and exercise, through to those who require oral medicines or those who need to take daily insulin injections.

Further information

Several laboratory tests may be used to monitor diabetes on a regular basis, by monitoring glucose control, kidney function and lipids. Chat to your GP for further information about these tests.