

Hyperglycaemia

The digestive system breaks down carbohydrates into glucose. This simple sugar is then transported to each cell via the bloodstream. The pancreas secretes the hormone insulin, which allows the glucose to move from the blood into the cells. Once inside a cell, the glucose is 'burned' along with oxygen to produce energy.

Generally, blood glucose is very tightly regulated by insulin according to the person's eating habits and activity levels. Hyperglycaemia means too much glucose is circulating in the blood. A measurement of over 11mmol/L is usually considered a diagnosis of hyperglycaemia if the measurement is taken at any time or 7mmol/L if the test is done fasting. Consistently high measurements of blood glucose will mean you have diabetes (diabetes mellitus).

Some of the conditions that can cause diabetes include Cushing's syndrome and liver disease but, in most cases, there is no associated disease and people are said to have either type 1 or type 2 diabetes. Without treatment, diabetes can damage organs, including the kidneys, eyes and nerves. It is also an important risk factor for coronary artery disease and other vascular diseases.

Symptoms of hyperglycaemia

The symptoms of hyperglycaemia (and diabetes) include:

- Excessive thirst
- Frequent urination
- Fatigue
- Unexplained weight loss
- Vision problems, such as blurring
- Increased susceptibility to infections such as thrush.

Different types of diabetes

Diabetes is characterised by the body's inability to use glucose. There are different types of diabetes including:

- **Type 1 diabetes** – due to a lack of insulin
- **Type 2 diabetes** – due to a complex mix of insulin not working properly and insufficient insulin
- **Gestational diabetes** – a form of diabetes that some women develop during their pregnancy. Pregnancy blocks the action of insulin and can bring out a tendency to diabetes. Mothers with gestational diabetes are at increased risk of developing diabetes in subsequent pregnancies and in later life.

Causes of hyperglycaemia

There are some conditions and medications that can cause hyperglycaemia (and diabetes). These include:

- **Cushing's syndrome** – a collection of hormonal disorders characterised by high levels of the steroid hormones that act like cortisol, which is normally produced by the adrenal gland. Causes include tumours of the pituitary and adrenal glands, certain tumours in other areas of the body, and steroid drug therapy for inflammatory disorders

- **Pancreatitis** – the pancreas makes the hormone insulin. Pancreatitis is inflammation of the pancreas, which can be either acute or chronic. Alcoholics are one group at risk of developing pancreatitis. Other causes of diabetes with chronic pancreatitis include the inherited conditions cystic fibrosis and haemochromatosis
- **Acromegaly** – excess growth hormone secretion
- **Certain medications** – including some diuretics (drugs that remove water from the body) and steroids
- **Liver disease** – such as cirrhosis of the liver.

Diagnosis and monitoring of hyperglycaemia

Blood glucose levels can be tested and monitored in a variety of ways including:

- **Random blood glucose test** – a blood test that checks the blood glucose level, regardless of when the person last ate
- **Fasting blood glucose test** – the person fasts (has nothing to eat or drink beforehand) so that a 'baseline' blood glucose level can be established by blood test. This is the most common way a diagnosis of diabetes is made
- **Oral glucose tolerance test** – the person drinks a special preparation that contains glucose. A blood test is taken two hours later to check the blood glucose level
- **Glycosylated haemoglobin test** – this test is a guide to the average level of blood glucose over the previous three months. The glycosylated haemoglobin test is typically used as a way to monitor the treatment of a person with diagnosed diabetes
- **Home blood glucose monitoring test** – a person with diagnosed diabetes can test their blood glucose at home with a special kit. A drop of blood is placed on a strip of paper, which is then fed into a blood glucometer.

Treatment for hyperglycaemia

Treatment varies depending on what form of diabetes is diagnosed. For example, type 2 diabetes can often be managed with diet alone, or tablets may be prescribed. Type 1 diabetes requires regular insulin injections. Gestational diabetes usually resolves soon after childbirth when the pregnancy hormones are no longer present in the mother's body.

Hypoglycaemia means low blood glucose levels

An abnormally low glucose level in the blood is called hypoglycaemia. Some of the conditions that can cause hypoglycaemia include:

- **Taking insulin and oral hypoglycaemic medication** – usually for diabetes. Hypoglycaemia is a common result of treatment for diabetes, especially when the diabetes is well controlled. Occasionally, oral hypoglycaemic tablets are prescribed or given by mistake to people who do not have diabetes – this causes hypoglycaemia
- **Insulinoma** – a tumour of the pancreas that triggers the overproduction of insulin
- **Liver failure** – loss of the liver's capacity to produce glucose can cause hypoglycaemia.

Where to get help

- Your doctor
- Juvenile Diabetes Research Foundation Australia Tel. (03) 9696 3866
- Diabetes Australia Victoria Tel. 13 RISK (13 7475)
- Baker IDI Heart and Diabetes Institute Tel. (03) 8532 1111

Things to remember

- Hyperglycaemia means too much glucose is circulating in the blood and, when it is persistently high, it means the person has diabetes.
- Most people with hyperglycaemia have type 1 or type 2 diabetes. Occasionally, it is 'secondary' to another illness.
- Treatment is usually diet and oral hypoglycaemic tablets in type 2 diabetes, although eventually some people require insulin. In type 1 diabetes, insulin is always required.

This page has been produced in consultation with, and approved by:

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