

pre-diabetes

Nearly one in four adults over the age of 25 years has either diabetes or a condition known as pre-diabetes (impaired glucose metabolism). There are two conditions that fit into this category – Impaired Fasting Glucose (IFG) and Impaired Glucose Tolerance (IGT).

There is still a lot more to be learned about pre-diabetes. Without treatment, not everyone with Impaired Fasting Glucose will progress to Impaired Glucose Tolerance or type 2 diabetes. Likewise, not everyone with Impaired Glucose Tolerance will progress to type 2 diabetes.

This information sheet explains the differences, how they are treated and how they can be avoided in the first place.

The condition	The cause
IMPAIRED FASTING GLUCOSE	
Impaired Fasting Glucose is a pre-diabetes condition in which blood glucose levels are higher than normal but not high enough to be diagnosed as type 2 diabetes.	Impaired Fasting Glucose occurs when too much glucose is released into the bloodstream from the liver overnight. The liver is mainly responsible for keeping a proper supply of glucose in the blood and to the body when we have not eaten for several hours (after food has been absorbed). In IFG the liver does not respond normally to insulin and this is called 'hepatic insulin resistance' ('hepatic' means 'liver').
IMPAIRED GLUCOSE TOLERANCE	
Impaired Glucose Tolerance is also a condition in which blood glucose levels are higher than normal but still not high enough to be diagnosed as type 2 diabetes.	The risk factors for developing Impaired Glucose Tolerance are similar (and probably identical) to those for developing type 2 diabetes. People with pre-diabetes are more likely to get type 2 diabetes and are at risk of heart disease. However, with treatment, these risks can be reduced and even prevented.

Pre-diabetes (Impaired Fasting Glucose or Impaired Glucose Tolerance) is a condition in which blood glucose levels are higher than normal but not high enough to be diagnosed as type 2 diabetes.



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So what is the difference?

IMPAIRED FASTING GLUCOSE	IMPAIRED GLUCOSE TOLERANCE
Diagnosed when the fasting* blood glucose level is higher than the normal or non-diabetic range, but does not rise abnormally after having a sweet glucose drink. (OGTT – see below)	Diagnosed when the blood glucose level at 2 hours during an OGTT (see below) is abnormal but not high enough to diagnose diabetes.

How do you know you have one of these conditions?

Any glucose test, fasting or not, that shows higher than normal blood glucose levels, needs to be checked further. The doctor may therefore order an Oral Glucose Tolerance Test (OGTT) to find out more about the patient's glucose metabolism.

The results of this laboratory test show four possible diagnoses:

1. Normal glucose levels
2. Impaired Fasting Glucose
3. Impaired Glucose Tolerance
4. Type 2 diabetes

How it is tested	How it is diagnosed
IMPAIRED FASTING GLUCOSE	
<p>An Oral Glucose Tolerance Test (OGTT) is done at the pathologists. This involves:</p> <ul style="list-style-type: none"> • Taking adequate carbohydrates (150g) for 3 days prior to the test. • After not eating for 8 hours, a blood sample is taken from a vein, usually in the arm. • You are then given a sweet drink that contains 75g of glucose. • Blood glucose is checked, again by taking blood from the arm, 2 hours after having the glucose drink. 	<p>Impaired Fasting Glucose is diagnosed when results of the Oral Glucose Tolerance Test are as follows:</p> <p>Fasting blood glucose level is 6.1 mmol/L or more but less than 7mmol/L.</p> <p>AND</p> <p>Blood glucose level 2 hours after having the glucose drink is less than 7.8mmol/L.</p>

* 'Fasting' means having nothing to eat for 8 hours before the test.

How it is tested	How it is diagnosed
IMPAIRED GLUCOSE TOLERANCE	
<p>As with Impaired Fasting Glucose, an Oral Glucose Tolerance Test is done and involves the same steps:</p> <ul style="list-style-type: none"> • A diet high in starchy food for 3 days prior to the test is usually advised. • After not eating for 8 hours, a blood sample is taken from a vein, usually in the arm. • You are then given a sweet drink that has a lot of glucose in it. • Blood glucose is checked, again by taking blood from the arm, at 1 hour and again at 2 hours after having the glucose drink. 	<p>Impaired Glucose Tolerance is diagnosed when the results of the Oral Glucose Tolerance Test are as follows:</p> <p>Blood glucose level 2 hours after having the glucose drink is more than 7.8mmol/L but less than 11mmol/L.</p>

What is the treatment?

If pre-diabetes is detected during investigation for diabetes, the treatment involves the same lifestyle changes that are recommended for people diagnosed with diabetes. For most, this will include regular physical activity, healthy eating and if necessary, losing weight (see page 4).

Who is most likely to get pre-diabetes?

Risk factors for pre-diabetes are similar to those for diabetes which are:

- Being overweight – especially those who have excess weight around the waistline (ie: more than 94cm for men and more than 80cm for women).
- Being physically inactive.
- Having high triglycerides and low HDL-C (good cholesterol) and/or high total cholesterol.
- Having high blood pressure.
- Having a family history of type 2 diabetes and/or heart disease.

Other people at risk include:

- Women with Polycystic Ovarian Syndrome*.
- Women who have had diabetes in pregnancy (gestational diabetes) or given birth to a big baby (more than 4.5kgs).
- Those from Aboriginal and Torres Strait Islander background.
- Those from certain ethnic backgrounds such as the Pacific Islands, Asia and the Indian sub-continent.

Can type 2 diabetes be avoided?

Evidence shows that people with pre-diabetes are at high risk of progressing to type 2 diabetes. They can delay and reduce the risk of its development by adopting the lifestyle changes previously outlined under 'What is the treatment?'

Being overweight or having excess weight around the waistline increases the risk of progressing to type 2 diabetes. Losing even as little as 5–10% of your body weight and keeping it off, can help reduce the risk.

* For more information refer to the *Polycystic Ovarian Syndrome and Diabetes* information sheet.

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Lifestyle changes to lose weight and avoid type 2 diabetes

Healthy eating: A healthy eating plan for losing weight and reducing the risk of type 2 diabetes should include a reduction in total energy (kilojoule) intake as well as a reduction in total fat intake. This relates particularly to saturated fat from foods such as butter, full fat dairy products, fatty meats, takeaway foods and processed foods like biscuits, cakes and pastries. Include in your eating plan a wide range of high fibre, low GI carbohydrate foods such as wholegrain breads and cereals, legumes and fruit. Refer to the *Glycemic Index* information sheet to read more about GI.

For more detailed information and to work out a meal plan that's right for you, see a dietitian.

Regular physical activity: Regular physical activity helps your body to use insulin better. It also helps you to feel fit and healthy, so be creative in finding as many ways as you can to be active. Aim to do at least 30 minutes of 'moderate intensity' physical activity (such as brisk walking or swimming) on most, if not all, days of the week OR three 20-minute sessions of 'vigorous intensity' exercise per week (such as jogging, aerobics class, strenuous gardening).

Try to include some resistance training twice a week to improve the way your muscles work, such as body weight exercises or lifting weights such as cans of food.

Starting a regular activity program – and sticking to it – can often be made a lot easier by joining up with a group or motivated friend to encourage you to keep going.

Before starting any new type of physical activity, talk to your doctor to be sure it's okay for you and your health.

To find a local dietitian and for more information contact:

- Your State or Territory Diabetes Organisation on 1300 136 588
- The Dietitians Association of Australia on 1800 812 942 or www.daa.asn.au

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NT	www.healthylivingnt.org.au	QLD	www.diabetesqld.org.au
SA	www.diabetessa.com.au	TAS	www.diabetestas.com.au
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