

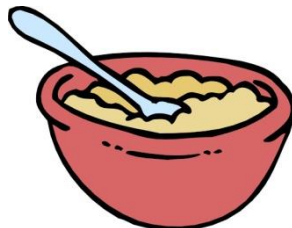
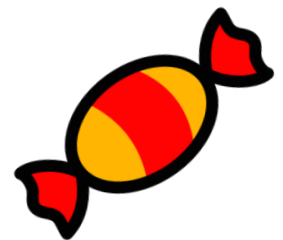


What is pre-diabetes?

Pre-diabetes is when your glucose levels are higher than normal but not high enough to be diagnosed as diabetes. This happens because the insulin that is produced to control blood sugar does not work as effectively as it should, resulting in the glucose building up in the blood stream. If this continues, it can damage blood vessels and increase the likelihood of stroke, heart attack and other health problems.

What is glucose?

Glucose is a source of energy provided to cells. Our brain runs almost solely on glucose as energy. Glucose is created from carbohydrates, including starchy and sugary foods. When we eat carbohydrates, our digestive system breaks it down into glucose. Glucose then enters the blood stream and is transported around the body and into cells to be used as energy.

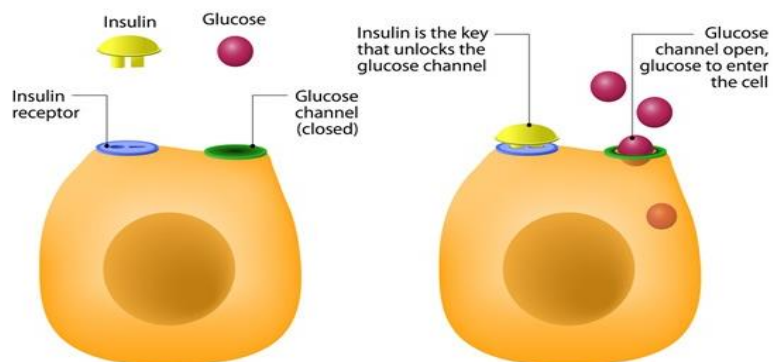


What is insulin?

Insulin is a hormone produced in the pancreas which regulates blood sugar levels. After we eat food, our body converts carbohydrate into glucose. Glucose travels via the blood stream into our cells to be used as energy. However, our cells are 'locked' and need to be unlocked before the glucose can enter it. Insulin is the key which unlocks the cell by binding with its insulin receptor. This then opens the channel into the cell where the glucose can enter and be used as energy.

When our body detects that glucose levels are raising in our blood, the pancreas will release insulin into the bloodstream, allowing glucose to enter the cell which in turn, reduces blood sugar levels. This helps to keep our blood sugar levels in a healthy range. Insulin also indicates to the liver to store some glucose (as glycogen) for a later time when blood sugar levels may drop and the body needs some more energy.

HOW DOES INSULIN WORK?





What causes pre-diabetes?

Pre-diabetes happens when the cells do not respond properly to the insulin (the key does not unlock the cell). This is also known as **insulin resistance**, as the cell is resistant to insulin.

Because the glucose cannot enter the cell, it stays in the bloodstream and begins to increase blood sugar levels. The body will try to cope with this by creating more insulin. This means that people with pre-diabetes often have higher insulin levels than those without pre-diabetes. If insulin resistance continues, blood sugar levels can raise to pre-diabetic levels and later into type 2 diabetic levels.

What is the difference between pre-diabetes and type 2 diabetes?

As the pancreas is producing more insulin, it can tire out over time as it is overworking. Eventually the pancreas can wear out and become damaged, leading to low production of insulin which results in blood glucose rising to diabetic levels.

Our cells can also become even more resistant to the effects of insulin, meaning that the glucose cannot be used as energy and instead, stays in the blood stream.

This can damage our artery walls and effect things such as our circulation, our eye health, foot health, kidney health and other areas of our health.

Pre-diabetes guide



Waterside PCN

Below is a table of the different blood tests used and what normal, pre-diabetes and type 2 diabetes readings are.

Blood test	Normal range	Pre-diabetes	Type 2 diabetes
Random	Below 11.1 mmol/l	N/A	11.1 mmol/l or more
Fasting	Below 5.5 mmol/l	5.5 to 6.9 mmol/l	7.0 mmol/l or more
2 hour post-prandial	Below 7.8 mmol/l	7.8 to 11.0 mmol/l	11.1 mmol/l or more
HBA1C (average over 3 months)	Below 42 mmol/mol	42-47 mmol/mol	48 mmol/mol or more

What are the risk factors for type 2 diabetes?

Age (over 40)

Ethnicity (African, Caribbean and South Asian)

Sedentary lifestyle (physically inactive)

Having a high-carbohydrate diet

Family history of type 2 diabetes

Gestational diabetes

Polycystic Ovarian Syndrome (PCOS)

High blood pressure

Low mood/depression

Some medications such as steroids

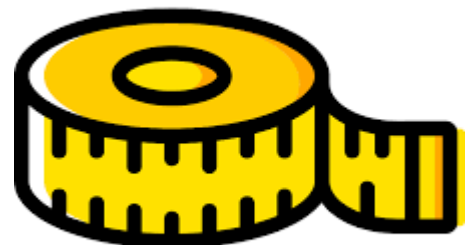
Pre-diabetes guide



Waterside PCN

The positive about pre-diabetes is that steps can be taken to prevent it from developing into type 2 diabetes by addressing the risk factors that you **can** change.

Weight management: Getting our weight to a healthy range can help reduce our risk of type 2 diabetes. This can be achieved by moving more and eating well. We can monitor our body composition by weighing ourselves and also taking waist measurements. To measure your waist, find the middle point between the top of your hip and the bottom rib and measure around. This can sometimes be where the belly-button is for some people.



Pre-diabetes guide



Waterside PCN

Physical activity: Doing at least **30 minutes of moderate physical activity 5 days a week** can help with weight management, blood glucose control, cardiovascular health and more.

At a moderate level of intensity, you may feel warm and that you are breathing heavier and faster. You may find it more difficult to speak however; you should be able to talk with a few breaths in between.

You can break the 30 minutes into 10 or 15 minute blocks and can include things such as gardening and cleaning as well as traditional ways of exercising, as long as it is at a moderate intensity. It is also beneficial to move more by reducing the amount of time spent sat down. Getting up in between TV advert breaks, standing instead of sitting and moving more can help contribute to better health.



Pre-diabetes guide



Waterside PCN

Mental health: Often when we are feeling low or stressed, we use food, alcohol and cigarettes as a way to relax. We may also not exercise as much. However, this can have a spiralling effect on our physical health which in turn, can worsen our mental health.



Try out different methods to relax such as writing in a journal, using relaxation apps (e.g. Insight Timer), and doing physical activity. Speaking to friends and family about how you are feeling can help you feel supported and get through tough times. If you are feeling low for longer periods of time, speak with your GP.



Medications can help stabilise and enhance mood, and can be further improved when used in combination with physical activity and relaxation techniques.



Pre-diabetes guide



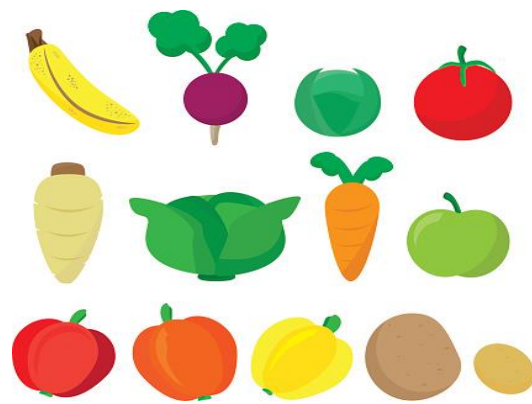
Waterside PCN

Diet: The modern Western diet consists of high-carbohydrate and high-processed foods which if eaten in excess, can increase weight, blood glucose, blood pressure and cholesterol. Carbohydrates consist of sugar, starch and fibre. Sugar and starch are converted into glucose however fibre cannot.

Although carbohydrates are essential for us to live and provide us with quick forms of energy (glucose), a diet high in carbohydrates can contribute to high glucose levels. Opting for lower sugar or starchy foods can help reduce total carbohydrate intake and swapping to wholegrain foods and high fibre foods can aid in keeping glucose levels steady, as well as keeping you full and promoting good bowel health.

The reference intake (see food label guide) for carbohydrates for the average adult is 260g per day however; this will differ person to person depending on their body composition, activity levels and health.

Although fruit contains many nutrients and naturally occurring sugars, this will still raise blood sugar levels, so portion control may help (see portion size guide). Make sure to eat the whole fruit rather than fruit juice/smoothies so you get the benefit of the fibre too.





Diabetes UK recommends to:

- Choose drinks without added sugar like unsweetened tea and coffee and avoiding energy or fizzy drinks.
- Reduce processed meats and cut the fat off where possible such as on bacon, beef, lamb, sausages and ham. You can get sources of protein from lean protein such as turkey and chicken, fish, eggs, nuts and pulses.
- Have more alcohol free days and swap to non-alcoholic drinks where possible.
- Swap to unsweetened yoghurt such as Greek or natural.
- Opt for healthier snacks like unsweetened yoghurt, unsalted nuts and seeds, fruits and vegetables.
- Eat plenty of vegetables, regardless of whether it is frozen or fresh.
- Include healthier sources of fats in your diet by eating nuts, seeds, oily fish, avocados and olive oil.
- Reduce salt intake by sticking to 1 teaspoon a day. Opt for cooking with herbs and spices instead of salt and keep an eye out on the salt content in pre packed foods (see food label guide).



What is glycaemic index (GI)?

GI is a system used to rate foods, indicating how quick they raise blood glucose levels. The index runs from 0-100 with pure glucose at a GI of 100 being the reference point. The higher the GI, the quicker it spikes blood glucose. A GI of below 55 is classed as low. Food does not have to be high in sugar to have a high GI and the cooking process and ripeness of the food can alter its GI.

Low GI foods raise blood sugar levels at a slower rate which can be beneficial for those with type 2 diabetes and pre-diabetes however; having a low GI doesn't necessarily mean the food is healthier. For example, watermelon has a higher GI than chocolate cake as the cake has more fat which slows down glucose absorption. Also it is important to consider not solely the GI of a food, but how much carbohydrate you are consuming.

Here are some examples of food and their GI:

White bread – ~75

Porridge - ~55

Raw apple - ~36

Watermelon – ~76

Boiled potatoes - ~78

Mashed potatoes - ~87

Chickpeas - ~28

Honey - ~61

IMPORTANT

If you have any concerns about your blood sugar levels or are planning on making changes to your lifestyle, please speak to a health professional first.