

Patient information from BMJ

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Diabetes type 2: what treatments work?

If you have diabetes, closely following your doctor's treatment recommendations can help you live a long and healthy life. Although not everyone with diabetes needs medicine, most people do, and you might need to take several types.

Treatments for diabetes

If you have diabetes you have too much glucose in your blood. Glucose is a kind of sugar that your body uses for energy. Normally, a chemical called insulin helps keep the levels of glucose in your blood steady. Insulin is made in your body.

But if you have type 2 diabetes your body is not making enough insulin, or the insulin your body makes is not working properly. So glucose can build up in your blood and cause problems. Doctors call this hyperglycaemia.

Having type 2 diabetes increases your chances of having two main types of health problem:

- problems with the larger blood vessels, leading to heart attacks and strokes (called macrovascular complications)
- problems with the smaller blood vessels in the eyes, kidneys, and feet (called microvascular complications).

Many people with diabetes need treatment with medicines to prevent these problems. This includes medicines to lower blood sugar, blood pressure, and cholesterol.

As well as taking medications, people with diabetes need to look after themselves in two key ways, to help keep the heart healthy and control blood sugar. These are:

- eating healthily. Your doctor might refer you to a dietitian to help you plan the best way for you to eat
- exercising regularly. Most people with diabetes are overweight and have problems with their blood vessels that can be helped with regular exercise.

For more information, see our leaflet: *Diabetes: what can I do to keep healthy?*

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Medicines to control your blood sugar

There are several types of medicine that can help keep your blood sugar levels under control. Some of them help your body release more insulin. Others help your body use insulin better. Some are tablets and others are injections.

Although doctors set general blood sugar targets for people with diabetes, in practice your treatment, including your blood sugar target, will be tailored to your individual needs.

Not everyone needs the same level of treatment. And different medicines suit some people better than others.

For example, some people take two or three types of tablet, while others might take a combination of tablets and insulin injections. It all depends what is likely to help you the most and to give you the fewest problems with side effects.

Tablets to control blood sugar:

- **Metformin:** this is the first medicine that most people with type 2 diabetes are offered for controlling blood glucose. It can also help reduce your chances of having a heart attack or stroke.

It doesn't make you put on weight, unlike many other diabetes medicines. But it can make you feel sick or get diarrhoea, especially if you take it on an empty stomach.

So your doctor will probably recommend that you build up the dose slowly and take this medicine with food. You might take metformin on its own or with another type of diabetes medicine.

- **DPP-4 inhibitors:** these medicines help reduce the amount of a substance called glucagon in your blood. You might also hear them called gliptins. These drugs are often used together with metformin.
- **Sulfonylureas:** these medicines help your body release more insulin. They are sometimes used as a first diabetes medicine. There are different types of sulfonylurea. You might take a sulfonylurea on its own, or with metformin or injections of medicines called GLP-1 agonists.

But sulfonylureas can sometimes make your blood sugar too low. The medical name for this is hypoglycaemia. Some people get an allergic reaction (usually a skin rash) when they start taking sulfonylureas. You might also gain some weight.

Meglitinide medicines are similar to sulfonylureas and are sometimes used instead. You take them just before you eat. You might take them as well as metformin. They can make your blood sugar too low, although this is less likely than with sulfonylureas. They can cause some weight gain.

- **Alpha glucosidase inhibitors:** these are sometimes used if you can't take another type of diabetes medicine. They slow down the speed at which your body breaks down food to make glucose. But they can cause bloating, wind, and diarrhoea.

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They might also cause a small amount of weight loss in some people. You might take an alpha glucosidase inhibitor on its own or with another type of diabetes medicine.

- Sodium-glucose cotransporter type 2 (SGLT2) inhibitors: these work by helping the kidneys to reduce blood sugar.
- Glitazones: these medicines are not used as often as some other diabetes medicines. And they are only used if you are also taking either metformin or a sulfonylurea.

Your doctor will want to monitor you regularly if you take a glitazone as they can cause serious side effects in some people, including liver damage, heart failure, and an increased chance of fractures.

Injections to control blood sugar

- Insulin: some people with diabetes need to take insulin to keep their blood sugar under control. Insulin can't be taken as a tablet. It's usually taken as an injection. Not everyone with type 2 diabetes needs to take insulin. But if your diabetes medicine is not working to keep your blood sugar under control your doctor may suggest you consider insulin.
- Glucagon-like peptide 1 (GLP-1) agonists: these are medicines given by injection that are sometimes used with diabetes tablets like metformin and sulfonylureas. As well as controlling blood sugar they might also help reduce your chance of having a heart attack or stroke.

They can have some side effects, such as lowering the level of sugar in your blood after you eat, and some people lose a little weight.

Medicines to prevent heart attacks and strokes

Having diabetes increases your chances of having a heart attack, stroke, or circulation problems. So most people with diabetes take medicines to help prevent these problems. These might include medicines to:

- control blood pressure
- control cholesterol
- prevent blood clots.

Medicines to control your blood pressure

Most people with diabetes need to take medicines for their blood pressure. If your doctor recommends blood pressure tablets your blood pressure is probably higher than the usual target range.

These are some of the types you might be prescribed. You might take just one, or a combination of tablets.

- Angiotensin-converting enzyme (ACE) inhibitors: these medicines help stop your blood vessels from narrowing too much and your heart from working too hard.

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ACE inhibitors can have some side effects. The most common one is a dry cough. Some people get low blood pressure (which can make you feel dizzy), kidney problems, or problems with their heart rhythm.

- Angiotensin receptor blockers (ARBs): these drugs work in a similar way to ACE inhibitors. If you can't take an ACE inhibitor your doctor might prescribe an ARB. They seem to work about as well. Most people only get mild side effects from ARBs. The most common side effect is dizziness.
- Diuretics: these help your body get rid of excess salt and water. Your doctor might suggest you take a diuretic as well as other blood pressure drugs. Diuretics can make you feel thirsty and can raise your blood sugar. They also make you urinate more.
- Calcium channel blockers: these medicines keep the blood vessels relaxed and open, making it easier for blood to flow through them. People usually only take them if they are already taking another blood pressure medicine.

Possible side effects include headaches, dizziness, swollen ankles, flushing (going red in the face), an uneven heart beat, and constipation.

Medicines to control your cholesterol

Taking a type of medicine called a statin can help reduce your chance of a heart attack or stroke. If you have diabetes this can help even if your cholesterol level is not high to start with.

Statin are the usual treatment for lowering cholesterol.

If your cholesterol is still high after taking statins, or if you can't take statins, there are other options. But we don't know if they work as well as statins to reduce the chance of a stroke or heart attack.

Medicines to stop your blood from clotting

Aspirin makes your blood less sticky so that it's less likely to form blood clots. This can help prevent a stroke or heart attack in people who are at high risk of these problems. Many people with diabetes take a low daily dose of aspirin.

Side effects

Most medicines can cause some side effects for some people. We don't know as much about the side effects of some of the newer medicines as we do about the ones that have been around for longer.

The leaflet that comes with your medicine lists the possible side effects. But very few are likely to affect you. Tell your doctor or pharmacist if you get any problems. You might be able to try different treatments.

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