

Diabetes: additional treatments to improve control

This short decision aid is to help you decide what additional medications you may consider if you have type 2 diabetes that is not well controlled.

This document is a summary of the online patient decision aid which has much more information to help you. You can access it online at :<http://sdm.rightcare.nhs.uk/pda/diabetes-additional-treatments-to-improve-control/>

The main options for additional medications to improve control in type 2 diabetes are:

- Insulin injections. There are different types of insulin, some short-acting and some that work over longer periods.
- GLP-1 analogues. These include exenatide and liraglutide, both given by injection under the skin. They help people's bodies make more insulin and less glucose. They also slow the rate at which sugar from food gets into the bloodstream. These drugs are mainly for people who are very overweight. They come in different forms, some short-acting and some that work over longer periods.
- Pioglitazone. This is a tablet treatment. It makes the cells of people's bodies more sensitive to insulin so they can remove glucose from the blood more easily.
- DDP-4 inhibitors. These tablets, also called 'gliptins', help people's bodies make more insulin and less glucose. They include sitagliptin and vildagliptin.

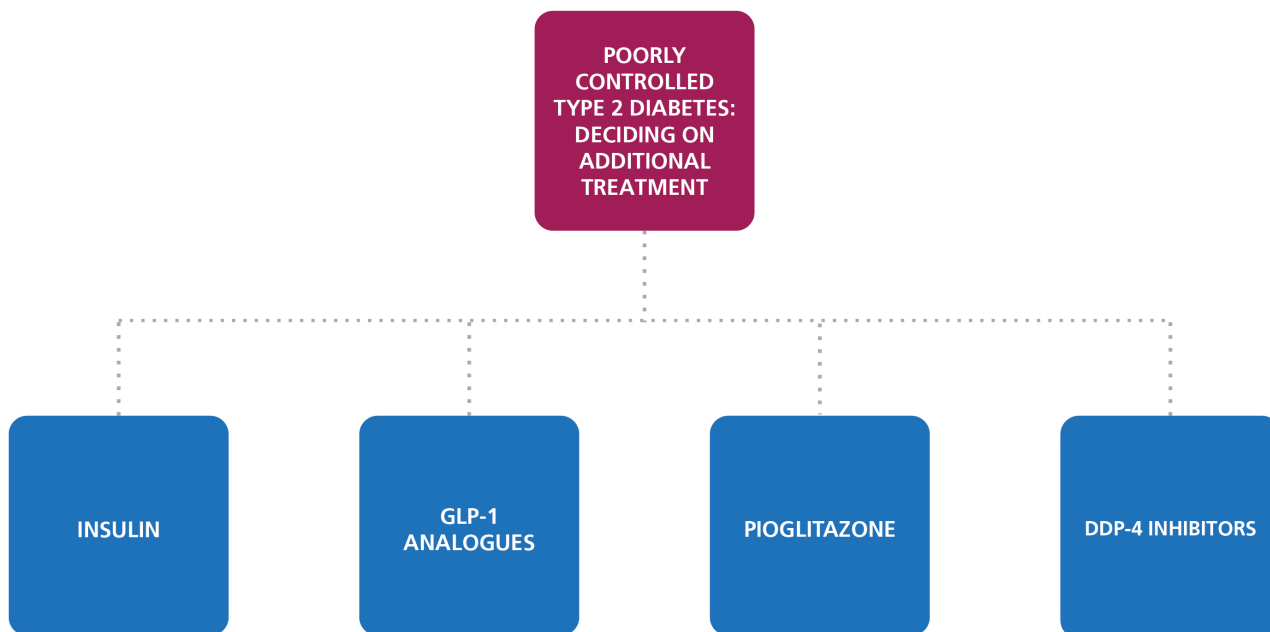
These are some of the most common treatments used but there are others, which people can discuss with their diabetes team.

People's choice of treatment may depend on many things, including their current treatments and medical problems, as well as their lifestyle, their weight, their occupation and how they feel about injections.

The types of decisions people with poorly-controlled diabetes are making include:

- My diabetes control is getting worse. What is the best extra treatment for improving it?
- I don't like the thought of injections. Are they as bad as I think they might be? Are tablets just as good?
- I'm worried about side effects. What's the best option for avoiding them?
- I have heart disease in my family. What's the best treatment for preventing it?

The right choice for people with Type 2 diabetes may change over time. This decision aid aims to help them make the right choice for them now, but they may wish to change their mind as their diabetes or their life changes.



What are my options?

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What is the treatment?	Insulin injections replace the insulin made naturally in the body to control blood glucose levels. There are different types of insulin, some short-acting and some that work over longer periods.	These include exenatide and liraglutide, both given by injection under the skin. They help people's bodies make more insulin and less glucose. They also slow the rate at which sugar from food gets into the bloodstream.	This is a tablet treatment. It makes the cells of people's bodies more sensitive to insulin so they can remove glucose from the blood more easily.	These tablets, also called 'gliptins', help people's bodies make more insulin and less glucose. They include sitagliptin and vildagliptin.

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What is the effect on diabetes control?	When people with Type 2 diabetes have insulin injections as a third treatment, as well as two glucose-lowering tablets, their blood glucose levels should go down. [1]	When people with Type 2 diabetes take GLP-1 analogues as a third treatment, as well as metformin and sulfonylurea tablets, their blood glucose levels should go down. [2] [3]	When people with Type 2 diabetes take pioglitazone tablets as well as metformin and sulfonylurea tablets, their blood glucose levels should go down. [4]	When people with Type 2 diabetes take DDP-4 inhibitors as a third treatment, as well as metformin and sulfonylurea tables, their blood glucose levels should go down. [5]

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the effects on symptoms?	People with symptoms of high blood sugars, such as feeling thirsty or tired or needing to urinate often, may feel better if they improve their diabetes control. Insulin can improve diabetes control. People having insulin as a third treatment say they have fewer symptoms of high blood sugars. [6]	People with symptoms of high blood sugars, such as feeling thirsty or tired or needing to urinate often, may feel better if they improve their diabetes control. GLP-1 analogues can improve diabetes control. People taking them as well as glucose-lowering tablets say they have fewer problems with diabetes symptoms. [7]	People with symptoms of high blood sugars, such as feeling thirsty or tired or needing to urinate often, may feel better if they improve their diabetes control. Pioglitazone can improve diabetes control.	People with symptoms of high blood sugars, such as feeling thirsty or tired or needing to urinate often, may feel better if they improve their diabetes control. DDP-4 inhibitors can improve diabetes control.

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the effects on complications?	Keeping blood glucose down to safe levels may reduce people's chances of getting complications like damage to the eyes, kidneys or nerves, as well as heart disease and stroke. People with Type 2 diabetes treated with insulin can reduce their chance of getting heart disease, kidney, eye and nerve damage. [8] [9] [10]	Keeping blood glucose down to safe levels may reduce people's chances of getting complications like damage to the eyes, kidneys or nerves, as well as heart disease and stroke. When people with Type 2 diabetes take GLP-1 analogues as a third treatment, their blood glucose levels should go down. [11] We can't say this will definitely prevent complications.	Keeping blood glucose down to safe levels may reduce people's chances of getting complications like damage to the eyes, kidneys or nerves, as well as heart disease and stroke. When people with Type 2 diabetes take Pioglitazone as a third treatment, their blood glucose levels should go down. [12] We can't say this will definitely prevent complications.	Keeping blood glucose down to safe levels may reduce people's chances of getting complications like damage to the eyes, kidneys or nerves, as well as heart disease and stroke. When people with Type 2 diabetes take DDP-4 inhibitors as a third treatment, their blood glucose levels should go down. [13] We can't say this will definitely prevent complications.

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the effects on length of life?	People with Type 2 diabetes may live longer if treatment with insulin keeps HbA1c levels down to around 58mmol/mol, or 7.5%. Blood glucose levels that are lower or higher than this may reduce life expectancy. [14] Over a 10-year period, people on insulin are 10% less likely to die of diabetic complications than people treated with diet alone. [15]	People with Type 2 diabetes may live longer if treatment with GLP-1 analogues keeps their HbA1c levels down to around 58mmol/mol, or 7.5%. Blood glucose levels that are lower or higher than this may reduce life expectancy. [16] We can't say that GLP-1 analogues will definitely increase life expectancy.	People with Type 2 diabetes may live longer if treatment with pioglitazone keeps HbA1c levels down to around 58mmol/mol, or 7.5%. Blood glucose levels that are lower or higher than this may reduce life expectancy. [17] We can't say that pioglitazone will definitely increase life expectancy.	People with Type 2 diabetes may live longer if treatment with DDP-4 inhibitors keeps their HbA1c levels down to around 58mmol/mol, or 7.5%. Blood glucose levels that are lower or higher than this may reduce life expectancy. [18] We can't say that DDP-4 inhibitors will definitely increase life expectancy.

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the effects on weight?	People taking insulin may gain weight, usually between two and four kilograms (4.5 - 9lbs). [19] People are less likely to gain weight if they make careful food choices and have an active lifestyle.	GLP-analogues can lead to weight loss if supported by careful food choices and an active lifestyle. People taking them have lost between 1.4kg (3lbs) and 2.3kg (5lbs) over 24 weeks' treatment. [20] People taking them for two years have lost 7.8kg (17lb). [21]	People taking pioglitazone may gain weight. People taking it for 20 weeks gained an average of 2.7kg (6lb). [22] People are less likely to gain weight if they make careful food choices and have an active lifestyle.	People taking DDP-4 inhibitors may gain very small amounts of weight - less than half a kg after 24 weeks treatment - or none at all. [23] [24]

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the potential side effects?	People having insulin injections may get more episodes of hypoglycaemia, when the blood glucose drops too low. [25]	People taking GLP-1 analogues sometimes get nausea, vomiting or headaches. They may also get itching or soreness around the injection site. Some people get more episodes of hypoglycaemia, when the blood glucose drops too low. [26] [27]	People taking pioglitazone may get swollen feet and ankles (peripheral oedema).	People taking DDP-4 inhibitors as a third treatment may get more episodes of hypoglycaemia, when blood glucose drops too low.

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the potential health problems?	Treatment with insulin may increase people's chance of getting severe episodes of hypoglycaemia, called hypos. When this happens they become drowsy and confused and may lose consciousness if they don't take sugary foods straight away. [28]	Treatment with GLP-1 analogues may increase people's chance of getting a severe inflammation of the pancreas or serious kidney problems. People who already have poor kidney function (eGFR less than 30) are not advised to have them. [29]	Treatment with pioglitazone may increase people's chance of getting bladder cancer or heart failure. It should not be used by people who have had heart failure in the past. [30] Pioglitazone may also increase the chance of bone fractures, particularly in women. [31]	Treatment with DDP-4 inhibitors may increase people's chance of getting an inflammation of the pancreas (acute pancreatitis). [32] It may also increase the chance of getting a nose, throat or urine infection. [33]

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the effects on quality of life?	We can't say for sure how insulin treatment affects people's quality of life. Some people find no change in quality of life when they take insulin as a third treatment. [34] Others say they have more pain and a lower quality of life than those who just take tablets. [35]	People who take GLP-1 analogues as well as glucose-lowering tablets say they are more satisfied with their treatment and have more energy. This may be because the treatment can help them lose weight. [36]	We can't say for sure how treatment with pioglitazone affects people's quality of life. Better controlled patients on three different tablets say they have the same quality of life as poorly controlled patients on two different tablets. [37]	We can't say for sure how treatment with DDP-4 inhibitors affects people's quality of life. Better controlled patients on three different tablets say they have the same quality of life as poorly controlled patients on two different tablets. [38]

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What monitoring is needed?	People taking insulin need to check their own blood glucose levels regularly, using a blood glucose meter or blood monitoring strips. Their diabetes care team can help them decide how often they need to do this and what to do if their levels are too high or too low. [39]	People taking GLP-1 analogues may need to have their diabetes control (HbA1c) and their weight checked more often to see if the treatment is working. They usually have to stop treatment if it hasn't reduced weight and blood glucose levels after six months. [40] [41]	People taking pioglitazone may need to see their diabetes team more often because of the risks of bladder cancer and heart failure. They need to report any blood in their urine or other bladder problems immediately to their doctors. If HbA1c levels haven't come down by at least 0.5% in six months they usually have to stop the treatment. [42]	People taking DDP-4 inhibitors may need to have their diabetes control (HbA1c) checked more often to see if the treatment is working. If HbA1c levels haven't come down by at least 0.5% in six months they usually have to stop the treatment.

	Insulin	GLP-1 analogues	Pioglitazone	DDP-4 inhibitors
What are the effects on your life?	People using insulin need to learn how insulin works, how to inject themselves, how to avoid hypoglycaemia and what to do if it happens. [43] Drivers of all types of vehicles need to inform the DVLA and need to monitor their diabetes regularly. [44] People with group 2 licences will need to stop driving for at least 3 months and need yearly medical assessments. People can get further details about these restrictions from their diabetes teams or the DVLA website.	People taking GLP-1 analogues have to learn how to inject themselves under the skin (subcutaneously). People also taking sulfonylureas and who hold Group 2 licences to drive large vans, lorries or buses, will need to monitor their blood sugars regularly.	Apart from watching out for bladder problems and needing extra checks, this treatment shouldn't affect people's lives.	Taking DDP-4 inhibitors should not have any effect on people's lives.

What are the pros and cons of each option?

People with type 2 diabetes have different experiences about the health problem and views on treatment. Choosing the treatment option that is best for the patient means considering how the consequences of each treatment option will affect their life.

Here are some questions people may want to consider about additional treatments for improving control in type 2 diabetes:

- How important is it to me to avoid the complications of diabetes?
- How much of an impact do I want the treatment to have on my life?
- Is it important to me to avoid hypoglycaemic episodes?
- How important is it to me to avoid potential side effects?
- Would I consider a treatment that could potentially lead to weight gain?
- Would I be happy to take injections?