

Information for patients, relatives and carers regarding sodium glucose co-transporter-2 inhibitors (SGLT-2i's) or 'gliflozins'

This information is available in Welsh, other languages, large print and other formats upon request.

What are SGLT-2 inhibitors and who benefits from using them?

You are being treated with one of the SGLT-2 inhibitor medicines, sometimes known as "gliflozins" or "flozins". These include, canagliflozin (Invokana[®]), dapagliflozin (Forxiga[®]), empagliflozin (Jardiance[®]) and ertugliflozin (Steglatro[®]). These medicines were initially developed to treat people with diabetes as they lower blood glucose (sugar) by increasing the amount of glucose in the urine. Reductions in weight and blood pressure can also occur. They have been found to have additional benefits that include protecting the kidneys and heart; slowing the decline in kidney function, reducing the risk of heart failure and in some circumstances reduces the risk of heart attacks. These kidney and heart benefits apply to all individuals, not just those with diabetes.

Side effects of SGLT2i's

Common:

- **Dehydration** – Dehydration is when your body does not have as much water as it needs. These medicines increase the amount of urine that you pass so may cause dehydration. To prevent dehydration, drink fluids when you feel any dehydration symptoms (thirst, dry mouth, dry skin, reduced urination) and you should drink enough during the day so your urine is a pale clear colour (unless otherwise instructed by your doctor/ nurse/ pharmacist). It is also important to drink when there is a higher risk of dehydrating, for example, if you are vomiting, sweating or you have diarrhoea (see overleaf for sick day rules).
- **Fungal genital infections (*and less commonly urine infections*)** – As these medicines increase the glucose in your urine, there is an increased risk of certain infections, such as thrush (redness and soreness) around the vagina/ penis. However, this is easily treated (usually with a cream) and a pharmacist or your GP can give you advice if irritation or itching occurs in these areas. Washing your genital area with water, using non-perfumed soap and avoiding wearing tight underwear will reduce the risk of infection. If you get recurrent thrush or urine infections that are causing you problems, please see your GP or specialist team.
- **Hypoglycaemia (low blood glucose)** – Mild hypoglycaemia is possible but rare and usually only occurs if SGLT-2i's are used in people with diabetes in combination with sulfonylurea tablets or insulin. If you have diabetes and are taking a sulfonylurea e.g. gliclazide/ glimepiride/ glipizide or insulin your doctor/ nurse/ pharmacist may therefore adjust the doses of these when you are starting therapy with a SGLT-2i. However if you are on insulin never stop taking it altogether.

Uncommon side effects that are expected to be extremely rare in people without diabetes

There are a series of side effects which may almost exclusively affect people with diabetes. These are uncommon or extremely rare, and are highly unlikely to affect people without diabetes:

- **Increase of acid in the blood** – SGLT-2i's may cause certain acids (ketones) to build up in the blood. This is called **ketoacidosis**. Ketoacidosis presents with nausea and vomiting, abdominal

pain, rapid breathing, and dehydration e.g. dizziness and thirst. Sufferers' breath smells like pear-drops/nail varnish remover. Ketoacidosis requires urgent medical assessment. If you believe you are developing symptoms of ketoacidosis then please seek urgent medical assessment reporting your concern and the medication you are taking. Blood ketones will need to be checked.

This is an event that occurs rarely in people without diabetes. This can happen rarely in diabetes even when your blood glucose is normal. When it happens in a patient with diabetes it is called **diabetic ketoacidosis (DKA)**.

The risk of ketoacidosis is increased if you do not eat for long periods, become dehydrated, drink excessive alcohol or are severely unwell. Please seek medical advice before starting any new diet particularly very low carbohydrate diets (also called ketogenic diets) as these can increase the ketones in the blood.

• **Foot disease leading to toe or other amputation** – if you have been told you have an “at risk foot” because of poor blood supply and are receiving treatment or investigations for this, you should clarify with your doctor/ nurse/ pharmacist if you should start or remain on an SGLT-2i.

Exceedingly rare:

• **“Fournier’s gangrene”** – this is an exceedingly rare infection in the groin area requiring urgent medical attention. The main symptom is severe pain and soreness on the genitals or space between the genitals and anus. Other symptoms are redness and swelling in that area and fever or malaise. If this develops, stop your SGLT-2i and seek clinical advice urgently (and explain that you are taking a SGLT-2i).

When to stop taking SGLT2 inhibitors if you become unwell

It is best practice to follow good sick day guidance as explained below with these medications. You should also not take your SGLT-2i if you are fasting (e.g. before an elective surgical operation or for a procedure).

Sick day rules

If you are unwell (vomiting, diarrhoea, fever, sweats and shivers or infection), and unable to eat and drink as you normally do, you should temporarily miss out the medicines listed below. If you are unsure or have any questions, please seek medical advice from your GP/ pharmacist/ NHS 111. Try to avoid dehydration by drinking plenty of fluids.

- Heart or blood pressure medication, or medication for CKD ending in –sartan or -pril– e.g. ramipril, lisinopril, losartan
- Sacubitril/ Valsartan (Entresto) used for heart failure
- Diuretics - (water tablets) e.g. furosemide, bumetanide, spironolactone
- your SGLT-2i/“gliflozin” – i.e. canagliflozin, dapagliflozin, empagliflozin or ertugliflozin
- Metformin (used for diabetes)
- NSAIDs- non- steroidal anti- inflammatory drugs (painkillers) e.g. ibuprofen, diclofenac

If you have diabetes, and usually check your blood glucose levels, you must increase the number of times you check them whilst unwell. If they run too high or low, please seek medical advice.

Restart your medicines as soon as you are well and eating normally. Please seek medical advice if you continue to feel unwell after 48 hours.

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