

Empagliflozin and Canagliflozin

Empagliflozin (Jardiance) and Canagliflozin (Invokana) are medicines that belong to the 'SGLT-2 inhibitor' class of medications. They are used to lower blood sugar in people with Type 2 Diabetes. You may be prescribed an SGLT-2 inhibitor on its own or in combination with other diabetes medicines.

What do SGLT-2 inhibitors do?

SGLT-2 inhibitors increase the amount of sugar passed in your urine. This lowers the amount of sugar in your blood. The sugar passed in your urine contains lots of calories and so SGLT-2 inhibitors can help some people lose weight.

SGLT-2 inhibitors lower the risk of heart disease and help people with heart failure. Therefore they may be particularly beneficial if you already have these conditions or are at high risk of developing them in the future. Canagliflozin has also been shown to protect kidney function in people with diabetes kidney disease.

How are SGLT-2 inhibitors given?

SGLT-2 inhibitors are given in tablet form and can be taken at any time of the day, usually accompanied by a glass of water. It is important to take them at the same time each day. They can be taken on an empty stomach.

What are the risks of taking SGLT-2 inhibitors?

SGLT-2 inhibitors are usually very well tolerated. Most people do not get any side effects at all. However, like all medications, SGLT-2 inhibitors can cause side effects in some people and, very rarely, these can be serious. A full list of side effects is provided in the 'patient leaflet', which is included in all tablet packages.

Low blood glucose: SGLT-2 inhibitors are designed to lower your blood sugar and if taken along with certain other tablets this can increase your risk of a very low blood sugar (a 'hypo' or 'hypoglycaemia'). Symptoms include feeling very sweaty, shaky or a rapid heart beat. Your doctor or nurse will advise you if you are taking any medications that might increase your risk of a 'hypo' and will advise you how to alter your medication if this is a problem. 'Hypos' are usually easily treated with a snack containing sugar.

Urine and genital infection: Germs (bacteria and yeasts) like to grow in body fluids with a high sugar content. Because SGLT-2 inhibitors increase the amount of sugar in your urine, they increase the chance of urine infection and/or genital (vaginal or penile) thrush infection (sometimes known as Candida). These infections have been reported in 4-8% of people taking SGLT-2 inhibitors and they usually respond well to treatment.

The risk of infection is greatest in the time period just after you start a SGLT-2 inhibitor. Risk can be reduced by drinking plenty of non-sugary fluids and by maintaining good genital hygiene. Women should avoid vaginal douches and feminine hygiene products (as these can kill 'healthy' bacteria). Men should retract the foreskin when washing and dry gently with a towel before replacing. Conventional soaps, shower gels and bubble baths should be avoided. These products can dry the genital skin and cause cracks into which germs can get access. It is preferable to wash with soap substitutes. Your pharmacist can advise on suitable products and your doctor/nurse can also give you a more detailed leaflet on genital washing.

Severe urine infection is rare, but you should see your doctor or nurse if you have any signs of infection, such as burning pain or discomfort when passing urine or obvious blood in the urine. If you have itchy, cracked and/or painful skin in the genital area or a discharge from the penis or vagina, then you may have developed genital 'thrush' infection. You should apply an antifungal cream, as advised by your pharmacist, to the affected area (women may also benefit from an anti-fungal pessary). If your symptoms do not improve after 1 week, or worsen, you should consult your doctor or nurse.

There have been reports linking a serious genital infection called 'Fournier's Gangrene' to

SGLT-2 inhibitors. The risk is extremely low and is thought to be around 1 in 100,000. Affected individuals usually have other severe medical conditions. 'Fournier's Gangrene' usually starts with an area of redness or a sore in the genital/groin area that spreads quickly. People also usually feel very unwell. You must report any such symptoms urgently to your doctor or nurse.

Circulation to fingers and toes: People with diabetes are at increased risk of getting sores or ulcers on the feet and legs. SGLT-2 inhibitors can reduce the circulation to the fingers and toes and so increase the chance of a sore or ulcer developing. It can also make the fingers and toes feel colder. This can in theory increase the risk of amputation and so you should speak to your doctor or nurse if you develop a new sore or ulcer or feel that the circulation to your fingers and toes is less good.

'Sick day guidance': You should stop taking your SGLT-2 inhibitor if you become unwell, especially if you have vomiting and/or diarrhoea or are not eating and drinking. You should also stop your SGLT-2 inhibitor if you think you have COVID-19 infection. You can start taking your SGLT-2 inhibitor again once you are back to normal health. You should inform your doctor or nurse at the earliest opportunity that you have stopped your medicine.

SGLT-2 inhibitors can raise the blood levels of chemicals called ketones. Very rarely, this can lead to a condition called 'diabetic ketoacidosis'. Contact your doctor or nurse straightaway if you notice a sweet smell on your breath, sweat or urine, or if you have symptoms such as: feeling sick, tummy pains, losing weight quickly, feeling very thirsty, breathing unusually quickly, confusion, tiredness or sleepiness.

When should SGLT-2 inhibitors be avoided?

People who have recurrent urine or genital infections should not take an SGLT-2 inhibitor. Women who are pregnant, planning pregnancy or breast feeding should not take an SGLT-2 inhibitor.

Getting the most from your SGLT-2 inhibitor

Continue to take your SGLT-2 inhibitor regularly unless your doctor tells you otherwise. It is important that you keep your regular clinic appointments. If you have been advised by your doctor or nurse about changes to your diet, stopping smoking or taking regular exercise, it is important that you follow this advice. It is important to take care of the skin on your lower limbs and genital area and to report any sores or signs of infection to your doctor or nurse.



**Edinburgh Centre for
Endocrinology and Diabetes**

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