

Type 1 Diabetes and SGLT2 Inhibitors

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Children with Diabetes*

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Managing type 1 diabetes and keeping blood sugars within target ranges is complex and challenging. Since 2005, there have been six new medication classes brought to the market in the United States for treating diabetes.¹ While many were aimed to help the rising number of people with type 2 diabetes, two classes of medications have been shown to help people with type 1 diabetes as well.

The two classes of medications are GLP-1 agonists and SGLT2 inhibitors. Good thing those names make it easy to understand, right? We'll break down the meaning of SGLT2 inhibitors in this article, and [here you can find more information on GLP-1 agonists](https://childrenwithdiabetes.com/blood-sugar-management-t1d/medications-beyond-insulin) (https://childrenwithdiabetes.com/blood-sugar-management-t1d/medications-beyond-insulin) for people with t1d. GLP-1 agonists are injectable medications, and SGLT2 inhibitors are oral (pills), which is another huge bonus!

Sodium-glucose cotransporter 2 (SGLT2) inhibitors are a class of medications that increases the secretion of glucose by the kidneys through the urine.² Since you are passing more glucose through your urine, it does not stay in the blood stream and lowers blood glucose levels. These medications have also been shown to lower blood pressure and body weight, proving to be protective for both the kidneys and the heart.

Benefits	Risks	Mitigation for Risks
Protective for cardiovascular health	Ketosis or Diabetic Ketoacidosis (DKA)	<ol style="list-style-type: none">1. Monitoring of ketone levels, even when blood sugars are within range2. Eating sufficient carbohydrates to avoid starvation ketones3. Ensuring all insulin doses are taken for basal and bolus needs4. If vomiting or unable to eat and drink normally, skip dose of SGLT inhibitor5. Ensure adequate hydration
Protective for kidney health	Urinary Tract Infections	<ol style="list-style-type: none">1. Practice clean urinary tract health2. Get evaluated as soon as symptoms start3. Ensure adequate hydration
Lowers blood glucose levels and promotes weight loss	Hypoglycemia	<ol style="list-style-type: none">1. Lower insulin doses as needed, consider lowering insulin doses when starting medication2. Treat low blood sugars as needed3. Consider continuous glucose monitoring

There are some cautions when taking this type of medication, and an extra precaution for people with type 1 diabetes. First, since the drug causes you to excrete more glucose in your urine, it increases the risk of getting urinary tract infections and yeast infections. This risk is higher in women with diabetes, who already have an increased risk for both.³ Second, the SGLT2 inhibitors cause a risk for euglycemic diabetic ketoacidosis (DKA), meaning you can be in DKA but have blood sugars in the normal range.⁴

Since this is a known risk, it is recommended to check blood ketone levels more frequently and with [any signs or symptoms of ketosis](#) (<https://childrenwithdiabetes.com/t1-basics/what-is-diabetic-ketoacidosis-dka>). In June of 2019, [an article was published in Diabetes Care](#) (<https://diabetesjournals.org/care/article/42/6/1147/36001/International-Consensus-on-Risk-Management-of>) with an international consensus on managing the risks of DKA for people with type 1 diabetes taking SGLT Inhibitors.⁵ The consensus statement recommends avoiding SGLT Inhibitors if someone is on a low-carb diet, missing insulin doses often, or possibly going to become pregnant. They do note that if someone is interested in taking the medication and can make the appropriate changes to reduce their risk of ketones, they could then try the medication with caution and ketone monitoring.

Despite these possible side effects, the benefits of these medications outweigh the risks for many people with diabetes. Researchers in Japan noted that there were many studies proving SGLT2 inhibitors worked well for people with type 1 diabetes, but no one had discussed how to make insulin adjustments that are needed with the addition of the drug.² They designed a pilot study in which half of the participants would not lower their basal insulin and the other half would reduce basal insulin by 10%, which is still underway.

In the article about optimizing benefits with SGLT2's for t1d, the authors suggest reducing insulin, but not more than 20%, to avoid adding to the risk of DKA. They recommend that the person with diabetes and their healthcare team review CGM data or frequent bg monitoring data to determine which insulin should be reduced, basal or bolus. The authors also discuss how many people with t1d are overweight and over-insulinized and that SGLT2s could be a helpful addition to peoples' regimens to reduce weight and insulin doses.

Everything has risks and benefits, and it's important to discuss these with your health care team to see if adding a new medication is right for you.

References:

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2. [Multicenter, Open-Label, 2-Arm, Pilot Trial for Safe Reduction of Basal Insulin Dose Combined with SGLT2 Inhibitor in Type 1 Diabetes Mellitus: Study Protocol for a RISING-STAR Trial](https://pubmed.ncbi.nlm.nih.gov/34602832/) (<https://pubmed.ncbi.nlm.nih.gov/34602832/>)
3. CDC's Diabetes and Women
4. [Optimising the Benefits of SGLT2 Inhibitors for Type 1 Diabetes](https://www.cdc.gov/diabetes/library/features/diabetes-and-women.html) (<https://www.cdc.gov/diabetes/library/features/diabetes-and-women.html>)
5. [International Consensus on Risk Management of Diabetic Ketoacidosis in Patients With Type 1 Diabetes Treated With Sodium–Glucose Cotransporter \(SGLT\) Inhibitors](https://diabetesjournals.org/care/article/42/6/1147/36001/International-Consensus-on-Risk-Management-of) (<https://diabetesjournals.org/care/article/42/6/1147/36001/International-Consensus-on-Risk-Management-of>)

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