



# Hyperglycemic emergencies and sick days

---

Hyperglycemic emergencies consist of diabetic ketoacidosis and hyperosmolar hyperglycemic state. These situations require immediate medical attention since they can lead to serious conditions if left untreated.

## Diabetic ketoacidosis

Cells in the human body normally use glucose as their major source of energy. However, when there is not enough insulin, glucose cannot enter the cells and the cells must find another way to produce the energy needed to function. As a result, the body must break down body fat, creating ketones, a potentially harmful substance.

Diabetic ketoacidosis is characterized by the presence of ketones in the blood or urine, most of the time with hyperglycemia, which can be greater than 14 mmol/L. This complication occurs mainly in patients with type 1 diabetes.

Symptoms associated with diabetic ketoacidosis are:

- Extreme thirst
- Frequent need to urinate
- Deep, rapid breathing
- Fruity breath (characteristic odour of ketones)
- Abdominal pain
- Nausea, vomiting
- Weight loss
- Blurred vision
- Rapid pulse
- Headache
- Shortness of breath
- Dizziness
- Confusion or altered mental status
- Fatigue

If you are experiencing any of these symptoms, speak to your healthcare provider immediately.

You can reduce your chances of developing diabetic ketoacidosis by taking your insulin as prescribed, and by checking your blood sugar regularly to make sure that it is right where it should be - not too high and not too low.

## Hyperosmolar hyperglycemic state

Hyperosmolar hyperglycemic state occurs when hyperglycemia is high, often greater than 30 mmol/L, leading to severe dehydration due to the frequency and volume of urination. Dehydration can then lead to a drop in blood pressure, which can alter the individual's state of consciousness. It mainly affects patients with type 2 diabetes. This state is not characterized by an accumulation of ketones because insulin is not totally absent.

Symptoms of hyperglycemia as well as signs of dehydration are present and include:

- Frequent and abundant urination
- Extreme thirst
- Exhaustion
- Dry mouth
- Sunken eyes
- Weight loss
- Dry skin

The elderly are more at risk for this complication as they are less aware of their own thirst. People with kidney disease are also at a greater risk because their kidneys are less efficient at eliminating excess glucose.

## Sick days

On sick days, blood glucose is often higher due to the secretion of stress hormones (e.g., cortisol, adrenaline, glucagon), and the fact that patients exercise less, making insulin less effective. However, eating fewer carbohydrates can also lead to lower blood glucose. As a result, it is important for patients to check their blood glucose more frequently (at least 4 times a day) to make sure that it is neither too high nor too low. When sick, checking it more frequently (e.g., every 2 hours) than you normally do may be appropriate. Furthermore, patients with type 1 diabetes should check for ketones in their blood or urine every 2 to 4 hours when their blood glucose is high.

If you have difficulty drinking and eating, or if you are experiencing vomiting or diarrhea, your medication or insulin may need to be adjusted to prevent kidney damage and to minimize the risk of adverse effects. Using the table below, ask your health professional to indicate the steps to take with some of your medications, if necessary:

Drug class	Medication and guidelines
Sulfonylureas	
ACEI, direct renin inhibitors	
Diuretics	
Metformin	
ARBs	
NSAIDs	
SGLT2 inhibitors	

If you develop diarrhea or vomiting, it is important to avoid dehydration. Store-bought rehydration formulas (e.g., Gastrolyte, Pedialyte) are the best option. Drink a few sips of the solution regularly throughout the day. If the purchase of one of these beverages is not an option, a homemade solution is a great alternative. It is important to follow the recipe as is. Do not substitute any of the ingredients:

Ingredients	Quantity
Boiled water	2 ½ cups (600 mL)
Unsweetened orange juice	1 ½ cup (360 mL)
Table salt	½ tsp (2.5 mL)
Total	4 cups

### When should I see a medical professional?

When you are sick, you should see your doctor as quickly as possible or go to the hospital if any of the following situations apply to you:

- All diabetic patients: Altered mental status, fever with temperature over 38.5 °C for more than 48 hours, inability to eat or drink, signs of dehydration (e.g., dry mouth, sunken eyes, dry skin), persistent diarrhea or vomiting, blood sugar that does not respond to proper corrective measures.
- Type 1 diabetes: Elevated blood glucose (> 14 mmol/L) with ketones in urine or blood or blood glucose > 20 mmol/L with nausea, vomiting or abdominal pain.
- Type 2 diabetes: Elevated blood glucose (> 25 mmol/L) with excessive drowsiness.

### For more information:

Diabetes Québec  
[www.diabete.qc.ca/en](http://www.diabete.qc.ca/en)

Diabetes Canada  
[www.diabetes.ca](http://www.diabetes.ca)