IN PEOPLE WITH TYPE 1 DIABETES

DIABETIC KETOACIDOSIS (DKA)

IS DANGEROUS

Once the DKA process begins, things can progress quickly

CONFUSION  COMA  DEATH 

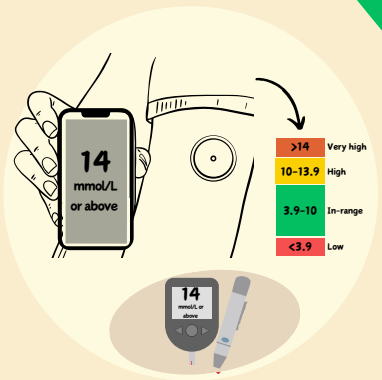
YOU CAN TAKE ACTION TO PREVENT ITS PROGRESSION: MEASURE YOUR KETONES

* Get a prescription for ketone testing supplies, and use if you're . . .

*Refer to reference page for ketones & DKA definition

Feeling sick or unwell

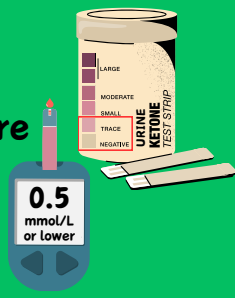
AND



Have very high sugars

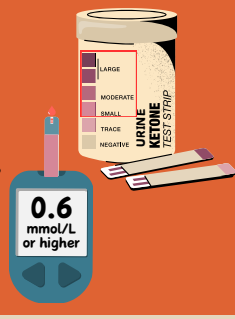
**Refer to reference page for exceptions

Ketones negative or below 0.6? Ketones are not the problem. Recheck in 2h*



*Refer to reference page for next steps

Ketones positive or above 0.6? The process has started. You are in danger.

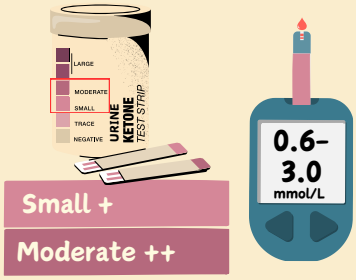


TAKE ACTION

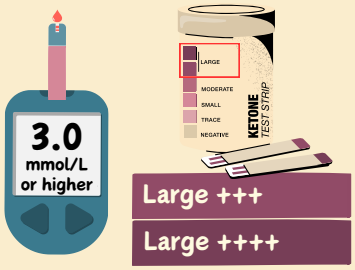
IMMEDIATE ACTION

- Stay hydrated
- Take 1.5X usual correction bolus of fresh rapid insulin by syringe*
- Check ketones every 2 hours; repeat until ketones are below 0.6

*unsure of how to calculate your correction bolus? Go to the reference page!



IF STILL NO IMPROVEMENT



- Feeling worse
- Ketones rising
- Ketones are above 3.0
- If you are not sure what to do...

GO TO THE HOSPITAL

You may not like the hospital, but it can save your life!

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DKA REFERENCE PAGE

What are Ketones?

When your body doesn't have enough insulin, your cells can't use sugar as a source of energy. As a result, your body breaks down fat to create energy instead. Ketones are an acid that your body produces as a byproduct when it breaks down fat.

What is DKA?

DKA, Diabetic Ketoacidosis, is a life threatening condition that occurs when you have too much ketones. In DKA, the excess ketones cause the blood to be more acidic than the body can handle. It usually happens when your sugars are very high.

Symptoms of DKA can be thought of as those that are due to high blood sugars and those that are due to blood acidity.

- Hyperglycemia: excessive thirst, dry mouth, frequent urination, blurry vision
- Acidity: nausea/vomiting, abdominal pain, weakness, confusion, fruity-smelling breath, shortness of breath or chest pain.

What puts you at risk of developing DKA?

Ketones develop when your body doesn't have enough insulin. Sometimes this can happen because of missed doses or failed insulin therapy (pump occlusions, bad insulin). Other times, your insulin requirements might be higher than usual because of a health stressor like infection, surgery, or other significant health events like a heart attack. Rarely, people with T1D might be put on some drugs like SGLTi's off-label. These medications increase your risk of DKA significantly.

Keep ketone strips around:

Keeping unexpired ketone strips on hand is vital so you can check your levels any time you're feeling unwell and have sugars above 14.0 mmol/L. Blood ketone is preferred over urine ketone, but either is a reasonable option.

If you don't have any on hand, speak with your doctor about getting a prescription for ketone strips. Alternatively, you can go to a pharmacy that carries ketone strips and buy them out-of-pocket.

How to calculate a correction bolus when ketones are above 0.6mmol/L:

If you usually estimate how much insulin you'd take to correct your sugar, take that guess and multiply it by 1.5 to calculate your correction for ketones. If you use an insulin pump, you should already have a correction factor, know as an insulin sensitivity factor (ISF); have the pump calculate your correction dose and multiply that by 1.5. Pumps sometimes fail, so make sure to give your dose by injection using fresh insulin. If you're unsure of how to treat a high blood sugar, it's a good idea to get in touch with your diabetes educator or go to the hospital.

DKA averted! Now what?

In the near future, make sure to follow up with your diabetes care team and let them know about this event. Things may be fine, or you may need a higher daily dose of insulin for the future.

**Exceptions to measuring ketones

Although not intended for use in T1D (off-label use), Sodium-Glucose Linked Transporter inhibitors (SGLTi) are associated with risk of "euglycemic DKA". In this situation, DKA can start even with normal blood sugars. If using SGLTi, ketones should be checked if feeling unwell, regardless of blood sugar levels. If ketones are positive, people should **St**op SGLTi, take additional **I**nsulin, ingest **C**arbohydrates and **H**ydrate ('**StICH**' Protocol). Pregnancy and extreme exercise are other conditions associated with euglycemic DKA.

Please Note: This core DKA prevention infographic was co-created between our research team, 33 people living with type 1 diabetes (PLWT1D), 33 healthcare professionals, an implementation scientist and media expert over a series of iterative implementation science steps. Expected to be formally published in 2025, the infographic is currently undergoing an evaluation study.

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