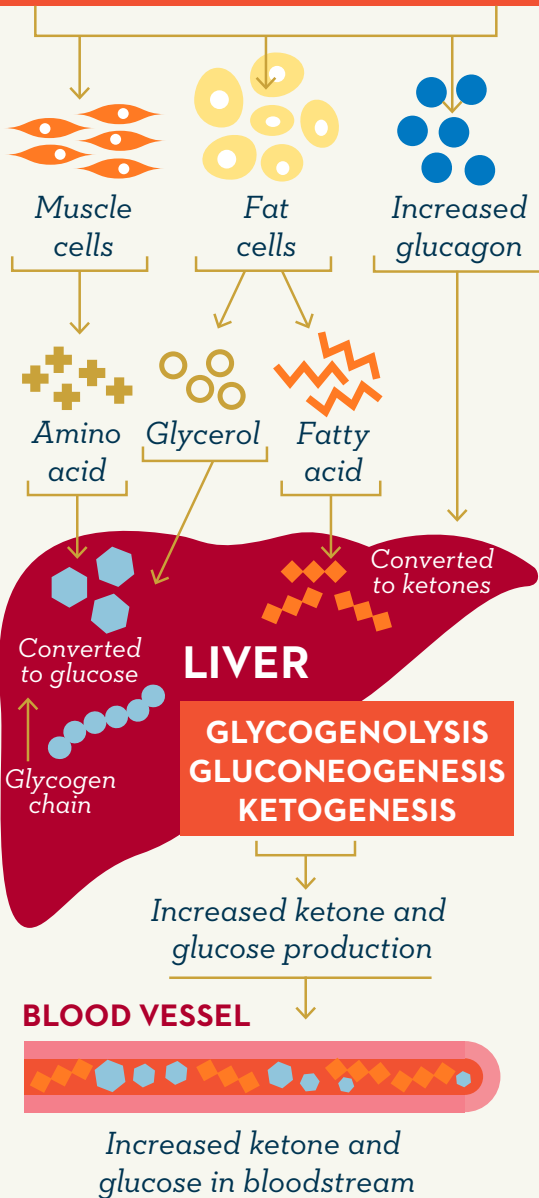


Diabetes-related Ketoacidosis

INSUFFICIENT OR ABSENT INSULIN



(Diabetes-related Ketoacidosis)
A deadly but avoidable complication of type 1 diabetes and occasionally type 2 diabetes

WHAT IS DKA?

DKA is a series of events that starts with not having enough insulin for the present condition and leads to a serious imbalance in the blood. When there is not enough insulin, many cells of the body are starved for glucose (also called blood sugar) and the body tries to make energy from other products. This changes your blood to be more acidic. When that happens, your breathing can become labored, you can become severely dehydrated and some people can go into a coma.

HOW IS DKA DIAGNOSED?

DKA is diagnosed when your blood tests as more acidic than normal and ketones are present. Other changes that occur in your body are changes in the level of sodium and potassium. Generally, blood glucose levels are high with DKA, but not always, especially if you are dehydrated or sick.

CAUSES OF DKA CAN INCLUDE:

- Infection or severe illness, which stresses the body and leads to the need for more insulin to correct high glucose levels.
- Forgetting or intentionally not taking insulin to cover carbohydrates at mealtime.
- Interruption of insulin delivery when on an insulin pump.
- When a cannula (the little plastic tube connecting you to your insulin pump) gets either dislodged or kinked. When this happens, there is limited or no insulin getting into your body. The result is that DKA can happen very quickly - in hours rather than days. If your glucose values do not come down after you give a correctional bolus, give a shot via pen or syringe for the correction and replace the insertion set or pod. Remember, just because



you just replaced it, does NOT mean it is working! Recheck your glucose in two hours after changing your set. Note: Some people prefer a stainless-steel infusion set because it does not kink.

- When your insulin goes bad because it became too hot or too cold. This can happen when, for example, your insulin is left in a hot car or on a sunny windowsill or freezes due to being exposed to cold weather or your refrigerator temperature being too low.
- Delayed diagnosis of diabetes – due the difficulty in determine the cause of the symptoms of type 1 diabetes – for example weight loss, thirst and frequent urination are frequent signs and symptoms of the flu or urinary tract infection.

SYMPTOMS OF DKA:

- *Very thirsty*
- *Frequent urination*
- *Nausea and vomiting*
- *Drowsy*
- *Deep breathing*
- *Fruity smell to the breath*
- *Stomach pain*
- *Coma if not treated*

PREVENTION OF DKA:

■ ALWAYS TAKE YOUR INSULIN!

- If you are not eating, you do not need to take it for food, but you need the background dose, whether basal rate through the pump or long-acting insulin given via shot. If you are eating foods that contain carbohydrates, you will need to cover the carbohydrates with insulin.
- Check your blood glucose frequently, at a minimum before every meal and prior to bed or use a continuous glucose monitor (CGM) so you can recognize when glucose levels are too high for longer periods of time (4 hours or longer).
- Always have either urine keto sticks or a blood ketone monitor with your medical supplies.
- If you cannot get your blood glucose levels to come down below 240 mg/dl, make sure to check for ketones. If they are

moderate or large, contact your diabetes team. If they are trace or small, give correctional insulin every 2-3 hours and drink lots of fluid.

- If you vomit or feel nauseated, call your diabetes care team. Sometimes people go to the hospital thinking they have the flu but have been without adequate insulin for some time and are in DKA. Or sometimes the flu can lead to DKA, due to stress and dehydration. Getting your flu shot each year will help you stay healthy and possibly avoid DKA.
- If you are on a SGLT2 oral medication to help manage your glucose levels, you can have DKA even if your glucose levels are within the normal range. Therefore, it is especially important for you to test for ketones if you are feeling ill. Additionally, avoid taking your SGLT2 medication if you are dehydrated, planning on an endurance event (for example a marathon), are on a severe carbohydrate restriction or are ill. It raises your risk of DKA.
- If you are on an insulin pump and it is not working correctly, have a written back-up plan for multiple daily injections available. As an example, you may need long acting insulin plus short acting insulin or correctional insulin every 3 hours until you receive a new insulin pump. This should be written out with someone on your diabetes team BEFORE you are sick.



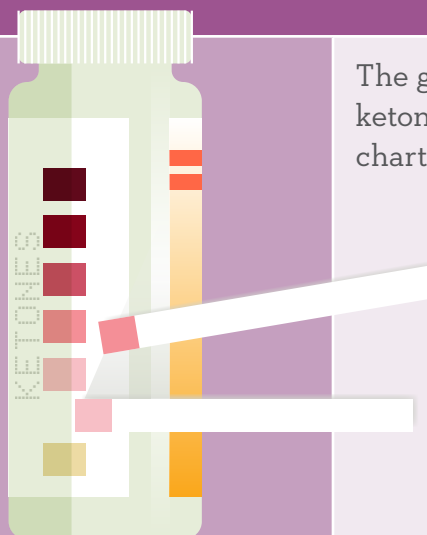
IF YOU ARE IN DOUBT - CALL YOUR DIABETES TEAM! IF YOU IGNORE IT, DKA CAN BE DEADLY.

WHEN SHOULD YOU CHECK FOR KETONES?

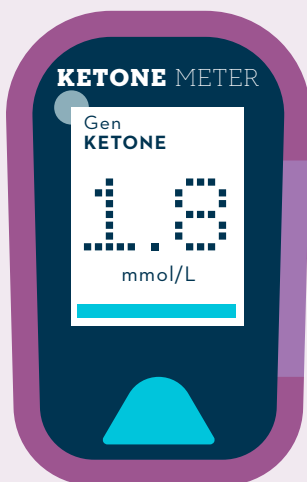
- If you are not pregnant and have type 1 diabetes, you should test for ketones whenever your glucose is over 300 mg/dl for several hours, especially when you are sick.
- If you are pregnant and have type 1 diabetes, you should test for ketones whenever your glucose is over 200 mg/dl. If you are on an insulin pump, you should check for ketones whenever your glucose is over 300 mg/dl without a known reason, or if your blood sugar does not come down within two hours of giving a corrective insulin dose.

KETONES

Ketones are chemicals made in your liver. You make them when you don't have enough insulin in your body to turn glucose (sugar) into energy. Because your body needs energy from a chemical like glucose, your body makes a "look alike" from fats. These ketones can make you very sick.



The goal is to have trace or no ketones with urine ketone chart



The goal if you are using a blood ketone meter is less than 0.6 mmol/L for blood ketones