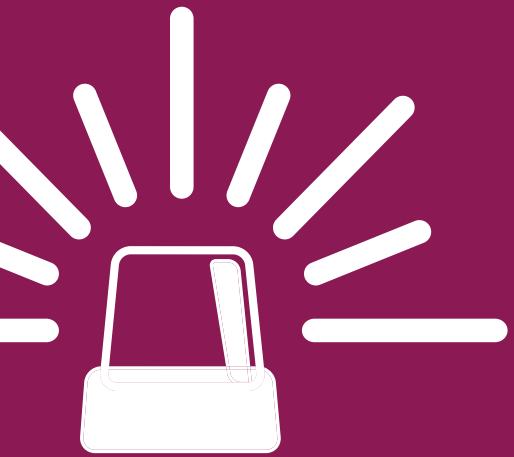
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KETOACIDOSIS

a diabetic emergency





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Dear readers,

There are two situations for people with diabetes which must be avoided at all costs: severe hypoglycaemia and an acute blood sugar imbalance, which could lead to ketoacidosis. Whilst hypoglycaemia can usually be resolved quickly by the patient, the treatment of ketoacidosis requires a more intensive effort in order to stabilise blood sugar levels.

The treatment of ketoacidosis requires a thorough understanding of diabetes and a knowledge of the necessary information. This brochure is designed to supplement your education and ensure your safety during treatment.

On the following pages, you can find the most important information on this topic, as well as tips and advice about how best to avoid this situation or treat it in emergencies.

Warmest regards,

Your MED TRUST team

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How does ketoacidosis occur and what makes it so dangerous?

Ketoacidosis is always due to an acute lack of insulin. A patient with type 1 diabetes who is completely dependent on insulin injections to regulate their carbohydrate metabolism, will react to a sudden lack of insulin within a few hours with a massive increase in blood sugar levels. This occurs as only insulin can transport the available sugar to the cells in order to generate energy.

In order to have enough energy available, the body instigates an emergency process. Fat is then metabolised in order to produce the required energy. This produces fatty acids, whereby ketones accumulate in the liver. This ketone overflow causes our blood to become over-acidic. This can result in a lethal process, whereby the blood's PH level is changed. This value is normal within a very narrow limit (7.35-7.45). Even the smallest deviations from this interrupt normal organ functions, hence the danger of such a metabolic imbalance.

The complete lack of insulin, which leads to this situation, must be treated following a specific plan. Without the knowledge required for treatment, diabetic ketoacidosis will inevitably result in a trip to a hospital emergency room.

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- LARGE NUMBERS
- MEALTIME MARKERS
- SIMPLE USE

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Who is particularly at risk of developing ketoacidosis?

A diabetic ketoacidosis is often a distinctive marker of type 1 diabetes. Many patients remember their symptoms during this phase. But even for existing type 1 diabetes, there is an increased risk of ketoacidosis if acute, and particularly feverish illnesses and infections occur, as these require a drastic increase in insulin for their duration. Severe and acute metabolic situations are very rare in patients with type 2 diabetes, as they still have their own insulin reserves.

How can you spot ketoacidosis?

The first sign is always a very high increase in blood sugar levels. If there isn't an immediate reduction in blood sugar levels, the following symptoms are typical for developing ketoacidosis.

- tiredness, fatigue or drowsiness
- very frequent urination
- stomach pains, dizziness to the point of vomiting
- the smell of acetone in the air (like nail polish remover or rotten apples)
- breathing difficulties

These indicate that quick treatment and, where possible, help is needed. Measuring the blood ketone levels makes it easier for you to accurately determine the metabolic situation and monitor the course of treatment.

Options for self control:

Determining the blood ketones:

For several years now, patients have been provided with blood sugar measurement devices, which can also measure blood ketones. A faster (8 seconds), more accurate and less obtrusive alternative to previous urine-ketone measurements. The start of a ketoacidosis is visible in the blood 1-2 hours before it appears in the urine. This offers you a crucial window of treatment.

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GALILEO





- NO CODING
- EXTRA FUNCTION: KETONE MEASUREMENT
- ILLUMINATED TEST STRIP PORT

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Treatment

INITIAL SITUATION:

There is a blood sugar level of above 250 mg/dL or 13.9 mmol/L and/or typical symptoms are present (intense thirst, weakness, dizziness, stomach pains...)

Measure ketones in the blood

Blood ketones of 0.6 to 1.5 mmol/L

- Inform your diabetes team.
- Inject yourself with fast-acting insulin using a **single** correctional factor or **10%** of your daily insulin dose.

Blood ketones over 1.5 mmol/L

- Seek medical advice and help
- Inject yourself with fast-acting insulin using a **double** correctional factor or **20%** of your daily insulin dose.

Drink approximately 1 litre of water per hour and measure your blood sugars and blood ketones again after 2 hours.

Blood sugar still above 250 mg/dL or 13.9 mmol/L

Blood ketones of 0.6 to 1.5 mmol/L

- Inject yourself with fast-acting insulin using a **single** correctional factor or **10%** of your daily insulin dose.

Blood ketones over 1.5 mmol/L

- Inject yourself with fast-acting insulin using a **double** correctional factor or **20%** of your daily insulin dose.

Drink approximately 1 litre of water per hour and after 2 hours, measure your blood sugar and blood ketones again.

Blood sugar still above 250 mg/dL or 13.9 mmol/L

Blood ketones of 0.6 to 1.5 mmol/L

- Inject yourself with fast-acting insulin using a **half** correctional factor or **5%** of your daily insulin dose.

Blood ketones over 1.5 mmol/L

- Inject yourself with fast-acting insulin using a **single** correctional factor or **10%** of your daily insulin dose.

Blood sugar below 250 mg/dL or 13.9 mmol/L and blood ketones below 1.5 mmol/L

FINAL SITUATION:

Do not inject yourself with any more insulin. Eat 20 g of carbohydrates (e.g. banana) in order to avoid hypoglycaemia. Continue to drink plenty of water and after 2 hours, re-measure your blood sugar and blood ketone levels.

Source: Diabetes Forum, Extra 2016

Investigate the cause in order to prevent future ketoacidosis!

Even when taking great care, ketoacidosis will likely occur at least once in a diabetic's life. The most important thing is to act correctly at the right time, recognise the cause and act to ensure that the same severe metabolic imbalances do not occur again in the future. Patients who deliberately or inadvertently stop taking insulin risk lacking the appropriate supply of insulin, which may lead to massive hyperglycaema within just a few hours. Patients wearing insulin pumps should exercise particular caution in this regard. A basic insulin supply must always be ensured, which means that replacement materials and replacement insulin must always be on hand. Even during bodily activity or a carbohydrate-free meal, the body needs a certain amount of insulin to maintain a normal metabolism. Making the right decisions can only be done if the patient is properly educated in a structured manner and, where needed, retraining should be carried out.

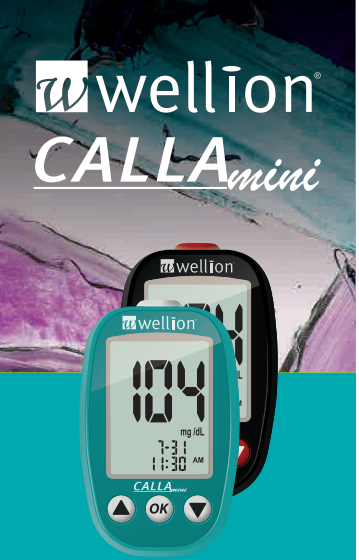
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LUNA trio



GLU, CHOL & UA

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- EXTRA FUNCTION: CHOLESTEROL MEASUREMENT

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NO CODE

- NO CODING
- SMALL AND HANDY
- LARGE NUMBERS

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Final remarks:

In general, every patient will know how to deal with hypoglycaemia but only a few check their blood ketones for a potential ketoacidosis if there is an unexplained blood sugar level of 250mg/dl (13.9 mmol/l). Please remember to replace expired ketone test strips in good time!

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GALILEO GLU/KET

GLU + KET

Wellion GALILEO

2 levels for me - glucose + ketone



NO CODE

- **NO CODING**
- **EXTRA FUNCTION: KETONE MEASUREMENT**
- **ILLUMINATED TEST STRIP PORT**

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NOTES

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