Patient information factsheet

# Diabetic ketoacidosis (DKA) in adults

**You have been given this factsheet to help you understand diabetic ketoacidosis (DKA). Please keep it in a safe place in case you need to refer to it in the future. It's a good idea to show this factsheet to your family or carers so that they're also aware of the warning signs and symptoms of DKA.**

To understand DKA, it helps to first have an understanding of blood glucose and insulin, and how they relate to diabetes.

## Glucose and insulin – how do they work?

- **Glucose** (sugar) is a source of energy that the body obtains from food.
- **Insulin** is a hormone (chemical messenger) made by the pancreas. It's vital for life and acts as a 'key', allowing glucose from the food you eat to enter your body's cells, so the body can use it as fuel, or store it until needed. It's not only important at mealtimes though; insulin also prevents your liver from releasing excessive glucose into the blood throughout the day, ensuring that blood glucose levels do not climb too high.

## How does this relate to type 1 diabetes?

- Type 1 diabetes occurs when the body is unable to make insulin. Without insulin, blood glucose levels are not well-controlled and can become very high, making you unwell.
- People with type 1 diabetes must administer insulin via an injection or personal insulin pump to control their glucose levels. Your diabetes team or GP will be able to explain type 1 diabetes and your insulin treatment to you in more detail, and answer any questions you have.

## What is diabetic ketoacidosis (DKA)?

DKA is a potentially life-threatening condition which can affect people who have diabetes. It is caused by a lack of insulin in the body. Without insulin, the body is unable to use glucose in the blood for fuel and starts to break down fat instead. This results in the production of toxic acids called ketones.

DKA is a medical emergency and requires urgent treatment in hospital with insulin and fluids through an intravenous (IV) drip.

## Common triggers for the fall in insulin levels leading to DKA

- **Illness or infection**: any illness (diarrhoea, vomiting or a chest infection, for example) can place 'stress' on the body, causing the production of stress hormones which cause blood glucose levels to rise (known as hyperglycaemia). If you have type 1 diabetes, your body can't respond to the increased blood glucose levels associated with illness by producing more insulin.
- **A missed dose of insulin treatment**: blood glucose levels can also rise if a dose of insulin is missed or not given correctly.
- **A problem with your device**: for example your insulin pen or pump isn't working properly.

## What are the signs of high blood glucose levels?

- excessive thirst (needing to drink lots)
- urinating more than usual
- nausea/vomiting (feeling or being sick)
- excessive tiredness

## What are the signs of DKA?

If you have some or all of the symptoms above, as well as abdominal pain and rapid breathing, you are likely to be at risk of developing DKA imminently.

## What should I do if i have signs of high blood glucose or DKA?

**If you have any of the symptoms above (or feel at all unwell) you should:**

- Test your blood glucose levels frequently, every two to four hours. If blood glucose levels read as above 11mmol/L, test for the presence of urine or blood ketones, using either urine ketone sticks or a blood ketone meter.
- If your urine dipstick shows +2 ketones, you are at risk of DKA developing. You should contact your healthcare professional for advice.
- If you are using a blood ketone meter, see the table below for advice on what to do.

| <0.6 mmol/L<br>Normal | 0.6 to 1.5 mmol/L<br>At risk of DKA | 1.5 - 3mmol/L<br>High risk of DKA | Above 3mmol/L<br>Very high risk of DKA |
|---|---|---|---|
| Your readings are in the normal range. Your risk of DKA is low. | Can indicate the development of a problem that may require medical assistance. Keep well hydrated and check your glucose levels frequently. | Contact your healthcare professional for advice. | You are likely to require urgent hospital treatment. Seek urgent medical advice immediately. |

- **Do not stop taking your insulin under any circumstances**: doses may need to be increased if you are ill. Your GP, practice nurse or diabetes team can advise you about this if you're unsure.
- If you're unable to eat full meals, ensure you eat snacks or drink fluids containing glucose, along with plenty of water or sugar-free fluids (four to six pints per day).
- If you feel unwell or are concerned, you should inform a family member, carer or close friend. It's a good idea to make sure they are aware of the warning signs of DKA, just in case.
- **If you are unwell, vomiting and your ketone levels are not responding to the measures above, or you have signs of DKA, seek urgent medical help quickly.**

## How can the chance of developing DKA be reduced?

- **Never stop taking your insulin under any circumstances**.
- Be confident in adjusting insulin doses during illness. Again, your GP, practice nurse or diabetes team will be able to advise you on this. Always seek advice quickly if you are unsure.
- Ensure insulin is stored correctly to stop it getting damaged and make sure insulin pens, needles and personal infusion pumps are working properly.
- Make sure you have a personal supply of ketone testing equipment (available from your GP or diabetes team).
- Always keep well hydrated. Water is best, try to avoid too many caffeinated drinks such as tea, coffee and fizzy drinks.

- If you feel unwell or have symptoms of high blood glucose, check your glucose and ketone levels straight away. Seek medical advice quickly if you're feeling unwell and are at all concerned about your blood glucose or ketone levels.
- Ensure you keep up to date with your personal diabetes education as much as possible. Your GP or diabetes team will be able to help you with this.
- It's very important to follow the instructions you have been given to care for and maintain your devices to keep them working effectively and safely. If you use a pump, remember to change your tubing/cannula every two to three days or as advised by your diabetes team.

## If you are admitted to hospital for any reason

- Tell the healthcare professionals looking after you that you have type 1 diabetes.
- If it's confirmed that you have DKA and you usually self-administer long-acting insulin, it's vital that this is continued, even if you go onto an intravenous (IV) insulin drip.
- Remember that you can request a review by the diabetes team while you're in hospital.

## Discharge checklist following a DKA-related admission to hospital

**If you have a DKA-related admission to hospital, a member of the diabetes team will complete this checklist with you, before you go home.**

- Functioning, up to date blood glucose meter: Yes/No
- Sick day rules leaflet provided: Yes/No
- Home blood or urine ketone testing equipment: Yes/No

Advice on insulin dose adjustment or change to insulin regimen, and notes from diabetes team:

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Referral for education:

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Signed: ..... Date: .....

Adult diabetes team

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## Useful links

**www.nhs.uk/Conditions/Diabetes-type1/Pages/Treatment.aspx**
**www.nhs.uk/Conditions/diabetic-ketoacidosis/Pages/Introduction.aspx**
**www.nhs.uk/conditions/Hyperglycaemia/Pages/Introduction.aspx**
**www.diabetes.org.uk**

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For help preparing for your visit, arranging an interpreter or accessing the hospital, please visit **www.uhs.nhs.uk/additionalsupport**



Version 3. Reviewed September 2023. Due for review September 2026. 1292