

How to Manage Your Diabetes during Illness for People Using Insulin (DKA)

As you have diabetes you need to take extra care when you become unwell. This means that you will need to take higher doses of insulin than usual even if you are not eating, it is a serious mistake to cut the dose or not take any insulin at all.

Reducing your insulin dose or stopping it altogether even if you are not eating can lead to serious problems and might cause a condition called **Diabetic Ketoacidosis (DKA – Type 1 diabetes)**, or **Hyper osmolar nonketotic - HHS formally known as HONK – Type 2 diabetes**) both of which can be fatal.

- What are ketones?
- What is DKA
- When are you at risk?
- Recognise the signs
- Test frequently
- Ketone test results
- React
- How to adjust your insulin
- Know when to seek help

NEVER STOP TAKING YOUR INSULIN

- Blood sugars can rise even if you do not eat.
- You will need more insulin if your blood sugar goes higher than 10 or if you have ketones in your urine or blood (see below for how much insulin to take).

What are ketones?

Ketones are produced when your body needs to get energy by breaking down fat instead of glucose.

This can happen for 2 reasons:

- If you do not have enough insulin in your blood
- If there isn't enough glucose available

Ketones become a problem when you do not have enough insulin to control ketone production, or when you are starving due to lack of food. Ketones can upset the balance of your body's chemistry and lead to a problem called Diabetic Ketoacidosis (DKA).

What is Diabetic Ketoacidosis (DKA)?

DKA is a life threatening condition which arises when the level of glucose in your blood is high or the level of insulin is low. This causes ketones to develop (see above).

Information for Patients

When are you at risk?

- When you are ill – any form of illness or infection will cause your blood glucose levels to rise this can happen very quickly, if you stop eating or drinking this makes the situation worse
- If you do not take your insulin – insulin should never be stopped especially when you are ill.

Recognise the symptoms of DIABETIC KETOACIDOSIS (DKA)

- Feeling thirsty all the time
- passing large amounts of urine,
- feeling tired and confused
- having dry or flushed skin
- vomiting or feeling sick
- pain in your stomach
- finding it hard to breathe
- Breath that smells of 'pear drops'

It is **very** important to prevent DKA happening. **Never** miss out insulin injections especially when you are unwell. If DKA develops, it must be recognised and treated quickly.

Learn to spot the signs and symptoms of ketosis

Contact your Diabetes Specialist Nurse, GP or local A&E dept IF:

- You are vomiting, not improving or becoming drowsy
- Your blood glucose stays high, even after treatment, or if it is low
- You are unsure of how much insulin or fluid to take
- Or you are worried and need advice

Do Not Delay – Your Life May Depend On It

Test frequently

If you are unwell or if your blood sugars are high test your blood sugar more often than usual:

- Check this every 1 to 2 hours
- If you cannot do this yourself, ask a relative or friend to help

If your blood sugars are above 15 mmols/l (12 mmols/l if you are pregnant) you should test your blood or urine for ketones regularly.

- Use a meter to test for blood ketones if you have one (MediSense Optium meters can do this).
- Use "Ketostix" or 'Ketur-test' to test your urine - your Diabetes Specialist Nurse or Practice Nurse will show you how to use them.
- Check for ketones every 2 to 4 hours.
- If you have ketones it is likely that you are lacking in insulin. If you ignore this, then **DKA** may develop.

Information for Patients

- **Drink plenty of fluids** you can easily become dehydrated when you are ill, especially if you have a temperature **or** have diarrhoea **or** vomiting.
- Take at least five pints of **sugar free** liquids, especially water, a day. This is approximately one glass every hour. If you cannot manage a whole glass at once, take regular sips of water.

Ketone test results

Guidance for Managing Capillary Ketones Results

Below 0.6 mmol/L	Normal range, keep monitoring, treat high blood glucose levels appropriately. Need to keep ketone level below 0.6mmol/L
0.6 – 1.5 mmol/L	Need to reduce ketone levels to below 0.6mmol/L, increase insulin (see below)
1.6 – 3.0 mmol/L	Need to reduce ketone levels to below 0.6mmol/L, increase insulin (see below). At risk of developing diabetes ketoacidosis.
Above 3.0mmol/L	At significant risk of developing DKA, seek medical help immediately from Accident & Emergency Department.

React - Increase your insulin:

- Check for ketones
- Try to eat your normal diet

If you are unable to eat a normal diet, replace your meals with sugary fluids such as milk, fresh fruit juice, soup, lucozade or ordinary cola - see below:

Take around 10g Carbohydrate every hour if you can.

Each of these contains 10 grams carbohydrate

Milk	1 cup (200ml)
Fruit Juice (unsweetened)	1 small glass (100ml)
Lucozade	50mls
Coca-Cola (not diet)	150mls
Lemonade(fizzy/sweetened)	150mls
Ice cream	1 briquette or 1 scoop
Jelly(ordinary)	2 tablespoons
Yoghurt(fruit)	½ small carton (60gms)
Yoghurt(plain)	1 small carton (120gms)

Information for Patients

How to adjust your insulin

- If your blood glucose is less than 10.0 take your usual insulin dose and remember to check your blood or urine for ketones.
- If you are still unwell check your blood glucose every 1 – 2 hours until you are feeling better and able to eat and drink normally.
- If your blood glucose is higher than this you will need to take extra insulin (see below). Remember to test your blood glucose again to see if this has worked.
- Always check for ketones if your blood glucose is increasing.
- You can increase your insulin by up to 1/5 of your total daily dose but not more than 10 units in one go.

Blood glucose level mmol/l & Ketones <1.0	Basal Bolus regime Increase usual bolus dose by	Twice daily insulin Increase usual dose by	Once daily insulin Increase usual dose by
10.0 – 13.0	2 units	2 units	4units
13.1 – 16.9	4 units	4 units	6units
17.0 – 28.0	6 units	6 units	8 units
Over 28.0	Contact your DSN or GP	Contact your DSN or GP	Contact your DSN or GP

Blood Glucose level mmol/l & ketones >1.0	Basal Bolus regime increase usual bolus dose by	Twice daily insulin increase usual dose by
10.0 – 13.0	4 units	4units
13.1 – 16.9	6 units	6 units
17.0 – 28.0	8 units	8 units
Over 28.0	Contact your DSN or GP	Contact your DSN or GP

If you are worried about adjusting your insulin contact your Diabetes Specialist Nurse, your GP or your Practise Nurse – but if you do not increase your insulin you will be at risk of developing DKA – you need to seek help **fast**.

Know when to seek help

- When your blood glucose levels and or your ketone levels are not responding to increased insulin
- You are feeling worse
- Your breathing changes
- You are unable to make a rational decision about your treatment

Our commitment to confidentiality

We keep personal and clinical information about you to ensure you receive appropriate care and treatment. Everyone working in the NHS has a legal duty to keep information about you confidential.

Information for Patients

We will always ask you for your consent if we need to use information that identifies you. We will share information with other parts of the NHS to support your healthcare needs, and we will inform your GP of your progress unless you ask us not to. You can help us by pointing out any information in your records which is wrong or needs updating.

Additional Sources of Information:

Go online and view NHS Choices website for more information about a wide range of health topics <http://www.nhs.uk/Pages/HomePage.aspx>

You may want to visit one of our Health Information Centres located in:

- Main Entrance at Birmingham Heartlands Hospital Tel: 0121 424 2280
- Treatment Centre at Good Hope Hospital Tel: 0121 424 9946 or contact us by email: healthinfo.centre@heartofengland.nhs.uk.

Dear Patient

We welcome your views on what you liked and suggestions for how things could be improved at this hospital. If you would like to tell us and others about your experience please make your comments through one of the following sites:

- NHS Choice:- www.nhs.uk
- Patient Opinion:- www.patientopinion.org.uk
- I want great care:- www.iwantgreatcare.org (Here you can leave feedback about your doctor)

Be helpful and respectful: think about what people might want to know about this hospital or how your experiences might benefit others. Remember your words must be polite and respectful, and you cannot name individuals on the NHS Choice or Patient Opinion sites.

If you have any questions you may want to ask about your condition or treatment, or anything you do not understand or wish to know more about, write them down and your doctor will be more than happy to try and answer them for you.