NHS London Clinical Networks

Sick day rules for patients on multiple daily injections (MDI): how to manage type 1 diabetes if you become unwell with coronavirus

If you become unwell with coronavirus and require advice specifically for coronavirus, please refer to the following websites:

- Diabetes UK https://www.diabetes.org.uk/about_us/news/coronavirus
- JDRF https://www.jdrf.org/coronavirus/
- NHS https://www.nhs.uk/conditions/coronavirus-covid-19/

If you are unable to follow sick day rules or need further help, please telephone your local diabetes team.

Please note: to follow this advice, it is important you know your most recent weight in kilograms or your total daily dose (TDD) of insulin (meal time + total long acting insulin) so that you can give the correct insulin dose to correct ketones. It would be useful to do the calculations and know your 10% and 20% Of TDD beforehand so that you know what to do if you become unwell.

Supplies you need access to at all times (as part of your kit box if you have one):

Please ensure you have access to following at all times, not just when you are unwell.

- 1-month supply of all insulins – long acting and quick acting
- Blood glucose meter with 1-month supply of test sticks/strips and lancets – check the sticks/strips/lancets have not expired
- If you use continuous or flash glucose monitoring systems (Dexcom/ Freestyle Libre) ensure you have access to back up blood glucose meter and test strips
- Ketone test kits – either urine or blood – check the ketone test strips have not expired

If you need to access supplies or prescriptions, please contact the local community pharmacist you usually go to for your prescriptions via telephone or virtually (where you can do so). Additional measures have been put in place to ensure delivery of prescriptions for high risk groups who need to self-isolate.

1. If you become unwell

- **If you develop Coronavirus symptoms or any other illness it is likely to affect your blood sugars.**
- **While you are unwell it is VERY likely you will need to take more insulin**
- **Even if you are vomiting you must NEVER stop taking your insulin**
- Monitor your urine or blood for ketones every 2 hours
- Monitor blood sugar levels once every 2 hours
- Drink at least ½ cup (100mls) of water every hour, but you can also drink any other sugar free drinks
- Please do not fast. Try to eat some food which contains carbohydrates e.g. yoghurt, toast, ice cream and cereal
- If you are worried about other symptoms not related to your diabetes, please seek medical advice from NHS 111 in the first instance
- **You will need face to face medical attention if you are continuously vomiting for more than 4-6hrs or if your ketone levels in blood or urine are not reducing despite following sick day rules.**

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2. Multiple daily injections (MDI) sick day rules

Feel unwell and taking multiple daily insulin injections? Test blood glucose and ketones

NO KETONES
(Negative or trace on urine test; less than 1.5mmol/l on blood test)
MINOR ILLNESS

KETONES PRESENT
(More than a trace in urine test; more than 1.5mmol/L on blood test)
Blood glucose raised (usually above 13 mmol/L)
SEVERE ILLNESS

Sip sugar-free fluids (at least ½ cup / 100ml per hour)

Test blood glucose and ketones every 2-4 hours

- Usual insulin to carbohydrate ratio if eating at your normal meal time.
- Use corrective quick acting insulin if blood glucose is raised, even if you are not eating.
- When unwell you may find you need larger bolus doses to reduce blood glucose.
- If glucose levels are persistently above target, consider an increase of 10% - 20% (or even more if required) in basal (long acting) insulin dose.

Test blood glucose and ketones every 2 hours

Calculate total daily dose (TDD) from previous day

If Ketones + to ++ on urine test 1.5-3mmol/L on blood test.
Give 10% of TDD as quick acting insulin every 2 hours plus usual insulin to carbohydrate ratio if eating. You may need to increase your basal (long acting) insulin dose by 10-20%.

If Ketones +++ to ++++ over 3mmol/L on blood test
Give 20% of TDD as quick acting insulin every 2 hours, plus usual insulin to carbohydrate ratio if eating.
you may need to increase your basal (long acting) insulin dose by 10-20% or more.

If you still have ketones go back to the start and repeat the process.

When **no ketones are present**
1. Eat/drink 10-20grams of carbohydrate. Use Carbs and Cals book or app to help with this. https://www.carbsandcals.com/app/app
2. Take usual meal time insulin
3. Take usual basal (long acting) insulin

If your ketones are still present after 4-6 hours and or you continue to vomit, are unable to keep fluids down, or unable to control your blood glucose or ketones you must go to the hospital as an emergency. You must not stop your basal (long acting) insulin

3. Calculating your total daily dose (TDD)

- If you need to calculate how much total daily dose of insulin you need to follow the sick day rules, see EXAMPLE calculations below. Each individual's total daily dose of insulin and calculations will be different, the example is a guide only.

Example 1 - if you do know your daily dose

Total of all quick acting (mealtime) insulin = 26 units
Total of all background (long acting) insulin = 24 units
Total daily dose = 26+24 = 50 units
10% of total daily dose = 50 ÷10 = 5 units
20% of total daily dose = 50 ÷ 5 = 10 units

Example 2 If you cannot calculate your daily dose please use the following chart based on your weight in kilograms

	Ketone level (mmol/L)	
Body Weight	**10% of total daily dose Blood ketone 1-2.9 Urine ketone + to ++**	**20% of total daily dose Blood ketone 3.0 + Urine ketone +++ to ++++**
40(Kg)	4 **units**	8 **units**
50(Kg)	5 **units**	10 **units**
60(Kg)	6 **units**	12 **units**
70(Kg)	7 **units**	14 **units**
80(Kg)	8 **units**	16 **units**
90(Kg)	9 **units**	18 **units**
100+(Kg)	10 **units**	20 **units**

AND IF blood glucose below 5.5 mmol/L - sip sugary drink/glucose regularly

4. Medication

If you are on any of the following medication you need to stop them when you are sick. Restart when you are well (normally after 24 to 48 hours of eating and drinking normally). When you restart your medicine, just take them as normal

ACE inhibitors – these medicines are used for heart conditions, high blood pressure and for kidney protection. If you are dehydrated, these medicines can stop your kidneys working properly.

- **Examples:** names ending in '*pril*' such as ramipril, lisinopril, perindopril

ARBs - these medicines are used for heart conditions, high blood pressure and for kidney protection. If you are dehydrated, these medicines can stop your kidneys working properly.

- **Examples:** names ending in '*sartan*' such as candesartan, irbesartan, losartan, valsartan

Diuretics – these medicines are used for excess fluid and high blood pressure and are sometimes called 'water pills'. These medicines can make dehydration more likely.

- **Examples** include bendroflumethiazide, furosemide, indapamide, bumetanide.
- If you are taking more than two tablets a day of either bumetanide or furosemide, please seek medical advice before stopping

Metformin – this is a medicine for diabetes. Dehydration can make it more likely that you will develop a serious side effect called lactic acidosis

GLP-1 analogues – these are medicines for diabetes. Dehydration can make it more likely that you will develop a serious side effect.

- **Examples** are exenatide, dulaglutide, liraglutide, lixisenatide and semaglutide

NSAIDs – these are anti-inflammatory pain killers. If you are dehydrated, these medicines can stop your kidneys working properly.

- **Examples** include ibuprofen, naproxen

SGLT2 inhibitors – these are medicines for diabetes. Dehydration can make it more likely that you will develop a serious side effect called ketoacidosis.

- **Examples:** names ending with '*flozin'* such as canagliflozin, dapagliflozin, empagliflozin and ertugliflozin