

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

If you become unwell and require advice specifically for coronavirus please contact NHS 111.
If you require support/advice on sick day rules and what to do please contact your local Diabetes team.

Consider contacting your DICE teams for advice and guidance through your usual form of communication or via Think Glucose Referral through your usual hospital switchboard

Insulin pump users can contact their Diabetes Specialist Team or care line numbers provided in clinic. Pump companies are extending warranties for 3 months and they also have a 24 hour advice line.

You will need face to face urgent 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.

Calculating correction doses for hyperglycaemia and ketones

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. **This guidance is for Type 1 DM but differs slightly between MDI and pump therapy. Please follow the specific sick day rules flow chart and advice on supplies, all other advice remains the same.**

Please ensure you have access to following at all times (as part of your kit box if you have one)

- At least 1-month supply of all insulin's – long acting and quick acting
- Blood glucose meter with at least 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 (Freestyle Libre/ Dexcom/ Medtronic Guardian, Enlite) ensure you have access to a back-up blood glucose meter and test strips and use BG testing alongside the sensor.

Freestyle Libre Care Line: 0800 170 1177 or via <https://www.freestylelibre.co.uk/libre/>

Dexcom Care Line information: <https://www.dexcom.com/en-GB/contact-us-direct> 08000315761

Medtronic Care Line: 01923205167

- Ketone test kits – either urine or blood – **(preferably blood ketone testing as this is more accurate)**-check the ketone test strips have not expired or the urine test strips have not been open longer than 6 months.

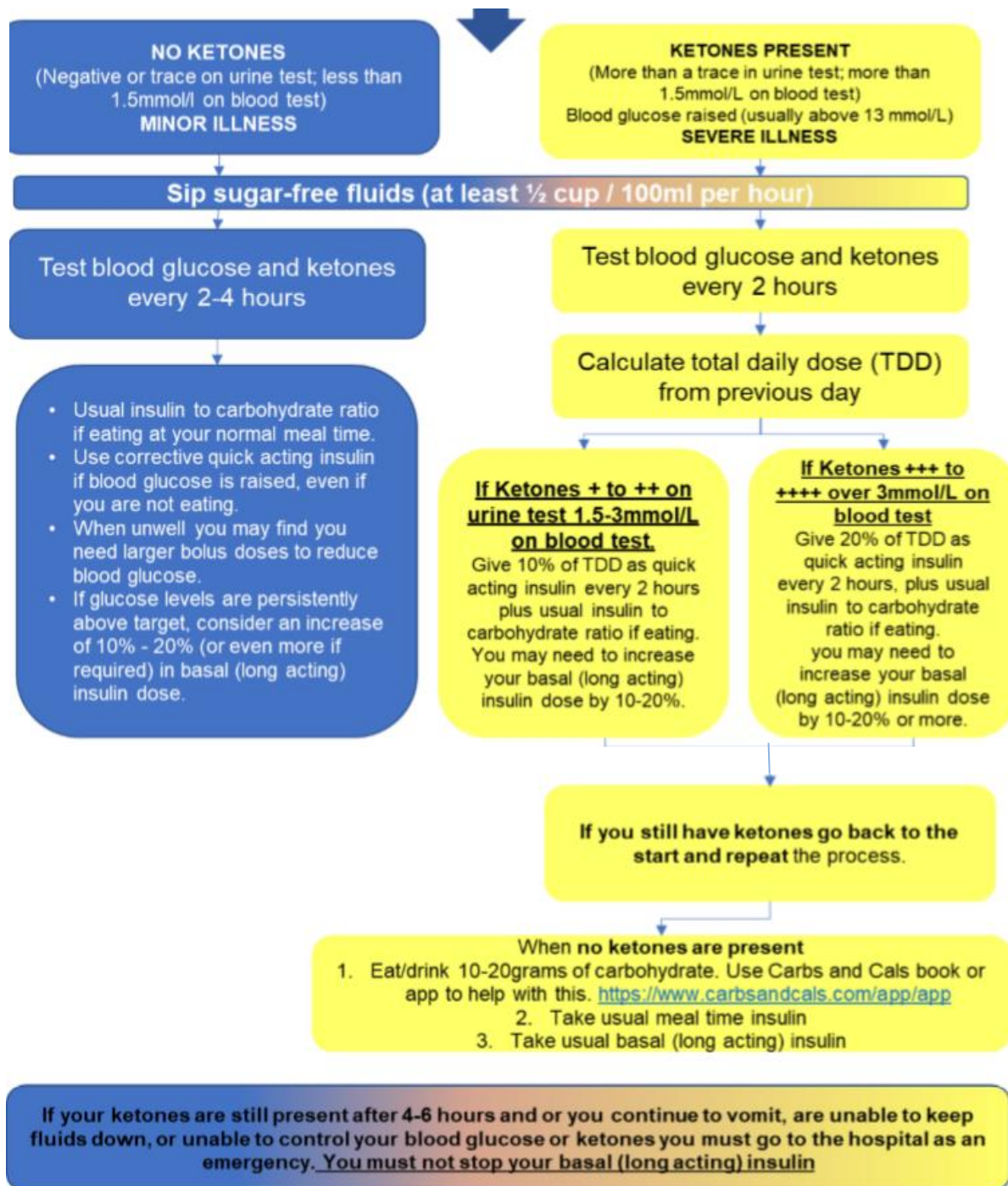
If you become unwell

- 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 4 hours and 2 hourly when ketones present at 1.5
- Monitor blood sugar levels once every 4 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.

Multiple daily injections (MDI) sick day rules

If you are feeling unwell on multiple daily injection please check your blood glucose and ketone levels and follow this chart



Ref: <https://www.england.nhs.uk/london/london-clinical-networks/our-networks/diabetes/diabetes-covid-19-key-information/>

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 = $50 \div 10 = 5$ units
20% of total daily dose = $50 \div 5 = 10$ units

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

Body Weight	Ketone level (mmol/L)	
	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 5.5mmol/L

– sip sugary drink/glucose regularly.

Ref: <https://www.england.nhs.uk/london/london-clinical-networks/our-networks/diabetes/diabetes-covid-19-key-information/>

If you are taking any of the following medications, 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.

Metformin – dehydration can make it more likely that you will develop a serious side effect called lactic acidosis

Sulfonylureas – if you are unable to eat or drink, it will be more likely that you develop low blood glucose (hypos)

Examples: names ending with 'ide' such as gliclazide, glibenclamide, glipizide.

If you are eating and drinking normally and blood sugars are high continue to take Sulfonylureas.

GLP-1 analogues –dehydration can make it more likely that you will develop a serious side effect.

Examples: names ending with 'tide' such as exenatide, dulaglutide, liraglutide, lixisenatide and semaglutide

SGLT2 inhibitors – 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

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, captopril

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

NSAIDs – these are anti-inflammatory pain killers. If you are dehydrated, these medicines can stop your kidneys working properly. • **Examples** include ibuprofen, naproxen

Sick day rules for patients on an **insulin pump**: how to manage Type 1 diabetes if you become unwell with coronavirus

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

Supplies you always need access to (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.

- At least 1-month supply of all insulin cartridges
- Ensure you have access to alternative means of **insulin delivery** – pens or syringes. You should have access to long acting and quick acting insulin to use in case of pump failure (**ensure you have emergency supplies at all times in case of pump failure/supply issues**)
- Blood glucose meter with at least 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 (Freestyle Libre/Dexcom) 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. Blood ketone testing is preferred. Check the ketone test strips have not expired or the urine test strips have not been opened longer than 6 months.
- Supply of hypo treatments and glucagon (check expiry).

If you become unwell follow advice as above with two hourly blood glucose and blood ketone testing, it is very likely your glucose levels will rise and you will require additional insulin (follow pump sick day rules in flow chart below)

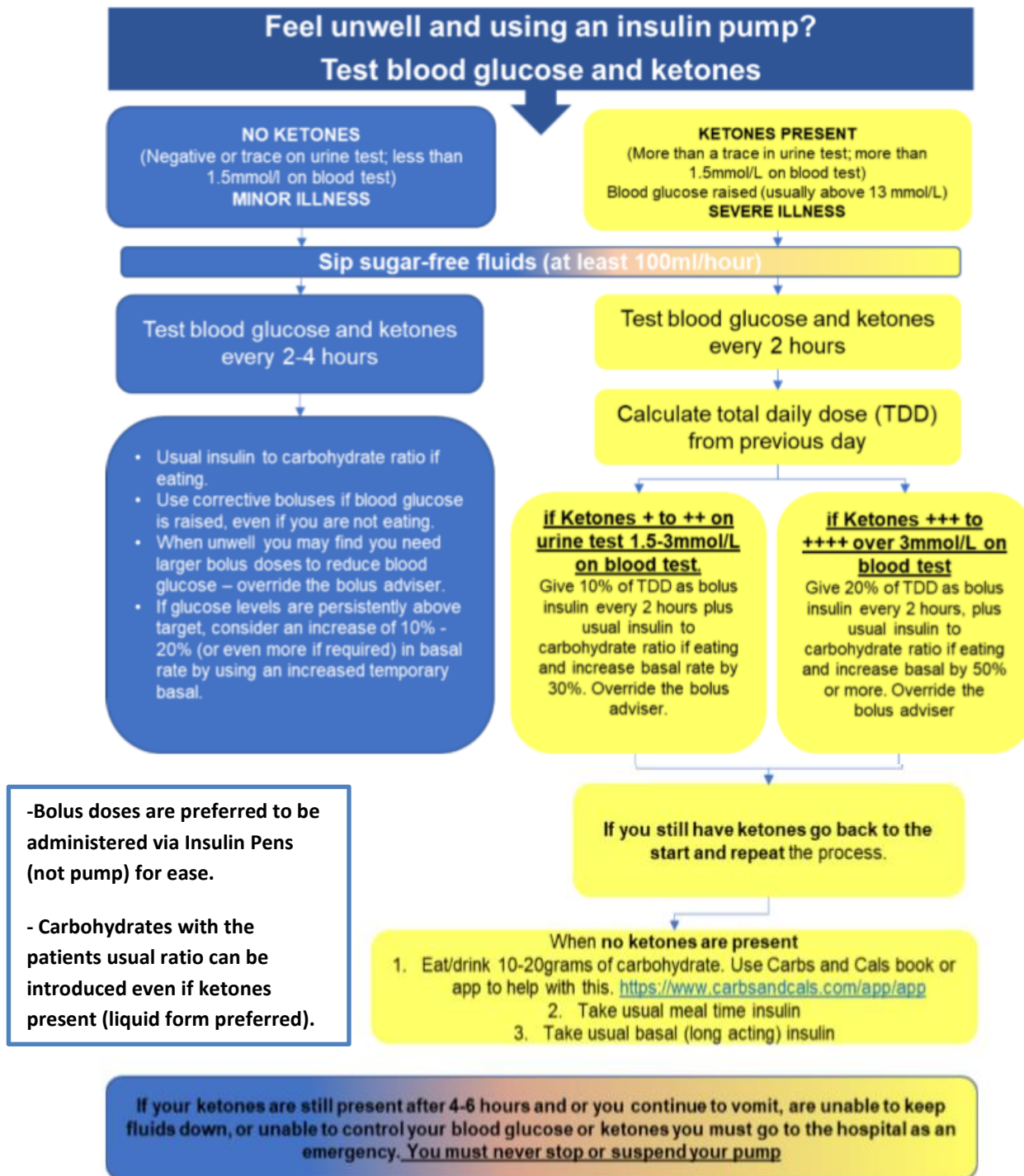
Management of unexplained hyperglycaemia

- Check blood glucose in two hours post correction bolus – if no change or glucose is higher, take correction dose of rapid acting insulin with a pen and check for ketones
- Change infusion set and reservoir (start new pod if using Omnipod® pump)
- Check glucose and ketones in two hours and take a correction bolus via pump if required, check for ketones if glucose still over 13mmol/L Follow sick day rules if ketones are present
- Do not go to sleep: - with unexplained hyperglycaemia which has not resolved - or, within two hours of a new set change

In the event of insulin pump failure – contact your local DSN or hospital Think Glucose team via switchboard and the company for a replacement/advice as appropriate.

- The emergency basal insulin dose via pens / syringes would be the same as your total daily basal insulin on the pump (e.g. total basal insulin 20 units on pump – if using Levemir start injections 10 units in the morning & 10 units in the evening, if using Lantus, start 20 units once a day injections)
- Your insulin carbohydrate ratio (for meals) and insulin sensitivity factor (for corrections) would be the same as on the pump
- In the event of pump failure and not being able to access long acting insulin you should check your glucose levels and give an injection of quick acting insulin every 3 hour
- If you suspect the pump is not administering insulin (pump failure), you should revert back to insulin injections with pens / syringe.

Pump therapy sick day rules



-Bolus doses are preferred to be administered via Insulin Pens (not pump) for ease.

- Carbohydrates with the patients usual ratio can be introduced even if ketones present (liquid form preferred).

Website References:

Diabetes UK: https://www.diabetes.org.uk/about_us/news/coronavirus
NHS: <https://www.nhs.uk/conditions/coronavirus-covid-19/>
<https://www.england.nhs.uk/london/london-clinical-networks/our-networks/diabetes/diabetes-covid-19-key-information/>

Patient leaflet Trend UK also available from: <http://trend-uk.org/resources/>