

Sick Day Rules in patients with Type 2 Diabetes (T2DM) taking oral antidiabetic medication (Clinician's guide)

Why do T2DM patients need sick day rules?

People with diabetes do not necessarily experience illness more often than those without; however, if diabetes is not managed well during acute dehydrating illness, it can escalate and result in more serious conditions such as diabetic ketoacidosis (DKA), hyperosmolar hyperglycaemic state (HHS) and acute kidney injury (AKI), which will require emergency hospital admission. It is, therefore, vital that the right advice is given to manage the initial illness.

When should I offer sick day rule guidance?

- The guidance is intended for people taking oral T2DM therapies with the aim of reducing the risk of DKA and blood glucose fluctuation during periods of illness
- Patients taking oral medications should continue to take them even if they are not eating
- However, sick day guidance should be followed when a person with diabetes is suffering from an acute dehydrating illness e.g. severe diarrhoea and/or vomiting, acute shortness of breath, febrile illnesses

When should I prescribe glucose or ketone testing strips?

- Access to glucose testing should be offered to individuals where this is deemed necessary
- Do not routinely offer self-monitoring of capillary blood glucose levels for adults with type 2 diabetes unless:
 - the person is on insulin **or**
 - there is evidence of hypoglycaemic episodes **or**
 - the person is on oral medication that may increase their risk of hypoglycaemia while driving or operating machinery **or**
 - the person is pregnant or is planning to become pregnant (see pregnancy section below, and the [NICE guideline on diabetes in pregnancy](#))
- If patients do not have access to blood glucose monitoring, they should be counselled on the symptoms of hyperglycaemia (Increased thirst/dry mouth, abdominal pain, urinary frequency, nausea/vomiting, pear drop smelling breath, tiredness, unintentional weight loss, blurred vision, recurrent infections (thrush, cystitis, skin infection))
- Do not prescribe ketone strips solely for use by patients prescribed an SGLT2 inhibitor. If a patient on an SGLT2 inhibitor presents unwell, their blood ketone levels should be checked by the healthcare professional, even if blood glucose levels are in the normal range

What sick day rule guidance should I give a patient taking oral antidiabetic medication?

- During periods of acute illness, blood glucose levels should be monitored and medical assistance must be sought if levels are persistently high or low

- Do not restart medication until eating/drinking fluids normally.
- Maintain normal hydration and food (eating little and often), where possible.
- Drink plenty of water/sugar free fluids to avoid dehydration for up to 24 hours. If not resolved after 24 hours seek medical advice
- Once vomiting has ceased or the individual is feeling better for 24 to 48 hours, oral medications can be restarted
- Check for urinary/blood ketones if taking a SGLT-2 inhibitor
- Seek medical advice if seriously unwell with infection or illness
- Advise patients of the signs and symptoms of DKA and HHS (see below)
- Advise patients to contact their local diabetes team if they are unsure about what to do
- If ill with diarrhoea, vomiting or fever, certain medications should be temporarily stopped (see SADMAN mnemonic below)
 - **SGLT2** inhibitors – Increased risk of developing euglycaemic DKA
 - **ACE** inhibitors – Increased risk of developing AKI due to reduced renal efferent vasoconstriction
 - **Diuretics** – Increased risk of developing AKI
 - **Metformin** – Increased risk of developing lactic acidosis
 - **Angiotensin receptor blockers (ARBs)** – Increased risk of developing AKI
 - **Non-steroidal anti-inflammatory drugs (NSAIDs)** – Increased risk of developing AKI due to reduced renal afferent vasoconstriction
- Although the below illnesses may not warrant sick day rules guidance to be followed in isolation, they can cause glucose levels to rise:
 - Abscess
 - Chest infection
 - Common cold
 - Influenza
 - Injury (e.g. fracture)
 - Pneumonia
 - Urinary tract infection

Both DKA and HHS are medical emergencies and require urgent hospital admission

What are the symptoms of diabetic ketoacidosis (DKA?)

- Excessive thirst
- Shortness of breath/laboured breathing
- Confusion
- Polyuria
- Abdominal pain
- Drowsiness
- Dehydration
- Leg cramps
- Nausea/vomiting
- Ketones detectable on breath (pear drop smell) / urine / blood

What are the symptoms of hyperosmolar hyperglycaemic state (HHS)?

Typically seen after several days with glucose levels consistently above 30mmol/L

- Disorientation or confusion
- Nausea
- Polyuria
- Thirst and dry mouth
- In the later stages, the patient can become drowsy and lose consciousness

Consultation points and rationale for each drug class

Metformin

Dehydration can make it more likely that they will develop a serious side effect called lactic acidosis. This drug needs to be stopped during periods of illness.

Inform patients to restart when they are well - usually after 24 to 48 hours of eating and drinking normally. Restart medication as normal, there is no need to re-titrate unless clinically indicated, e.g. change in renal function.

SGLT2 inhibitors

Sick day rules should be discussed on initiation and reiterated at every opportunity.

SGLT2 inhibitors should be temporarily withheld in the following circumstances:

- If hospitalised for major surgery or acute serious illnesses (see [MHRA 2020](#)). Blood ketone levels should be monitored (and be normal (less than 0.6) before restarting)
- Pre-surgery: 24 hours prior to surgery and not restarted until the patient is eating and drinking normally, is not dehydrated, is not receiving variable rate intravenous insulin infusion, ketone levels are normal, and the patient's condition has stabilised. Advise patient to seek advice from hospital teams
- Consider stopping in any other hospital admission, if acutely unwell, until patient well/stable. If unsure withhold and seek advice from named healthcare practitioner
- If patient develops volume depletion, not eating or drinking or has inter-current conditions that may lead to volume depletion (e.g. vomiting/diarrhoea).
- If patient has a severe infection

Treatment may be restarted once the patient's condition has stabilised and they are eating normally for at least 24 hours (providing no new contra-indications exist).

Restart medication as normal, there is no need to re-titrate.

Sulfonylureas

If they are unable to eat or drink, it will be more likely that they may develop hypoglycaemia. If they develop hypoglycaemia – advise that these medicines are stopped. They should be advised to seek medical advice before restarting. If they are eating and drinking normally and blood glucose is high instruct patients to continue to take sulfonylureas.

Glucagon-like peptide-1 (GLP-1) analogues

Dehydration can make it more likely that they will develop a serious side effect. If they develop acute abdominal pain, nausea and vomiting, they should be advised to stop the GLP-1 and seek urgent medical attention (pancreatitis has been reported as a side effect of this medication). They should seek medical advice before restarting.

Insulin

Monitor and record blood glucose levels at least four times a day (at mealtimes even if you are not eating your usual meals, and at bedtime). For patients with T2DM taking insulin, inform patient this should not be stopped and seek further advice from diabetes specialist team. A **suggested** adjustment is:

For blood glucose levels between 11.1 and 17mmol/L, add 2 extra units to each dose.

For blood glucose levels between 17.1 and 22mmol/L, add 4 extra units to each dose.

For blood glucose levels over 22mmol/L, add 6 extra units to each dose.

If taking more than 50 units in total daily, double the adjustments. All adjustments are incremental and should be reduced gradually as the illness subsides.

If blood glucose levels are dropping down to less than 4 mmol/L, reduce insulin dose by 10%. Make sure suitable “hypo” treatments are available.

References

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- [Leeds Citywide Guideline for the Safe and Appropriate Use of Sodium Glucose Co-Transporter 2 inhibitors \(SGLT2 inhibitors\)](#) (Last accessed 21/10/2022)
- [The Place and Value of Sodium-Glucose Cotransporter 2 Inhibitors in the Evolving Treatment Paradigm for Type 2 Diabetes Mellitus: A Narrative Review](#) (Last accessed 21/10/2022)
- [Trend Diabetes. Something you need to know: How to reduce your risk of genital fungal infection](#) (Last accessed 21/10/2022)
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Document History

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