# Diabetes sick-day management

RACGP
Royal Australian College of General Practitioners

Diabetes carries a higher risk of morbidity and mortality from infectious illnesses such as COVID-19[1] and influenza[2], and general practitioners (GPs) have an essential role in supporting people with diabetes.

In addition to addressing the extra vulnerability with sick days from illnesses such as COVID-19 and influenza, it is also essential to ensure other aspects of diabetes management are not neglected. Some simple steps to help GPs and people manage diabetes amid ongoing risks are outlined below.

## Do not wait for people to develop inter-current illness

Proactive support for people with diabetes is required to lower their risks of developing inter-current illnesses.

- Actively plan for sick days: People might need extra advice and support about how to manage their diabetes during periods of other illness (sick days). The Australian Diabetes Educators Association sick day management guidelines and the Royal Australian College of General Practitioners (RACGP) sick day management template may be used to assist practical management.
- Do not forget usual care: People need support to manage the ongoing aspects of diabetes care, which could be overlooked when unwell.
- Stay in touch: Contact all people with diabetes to discuss their management plan for inter-current illness, particularly influenza and COVID-19.
- Stay vigilant: Target those at higher risk (see below).

**Be alert to diabetic ketoacidosis**
Unfortunately, some people may first present with type 1 diabetes during an accompanying viral illness, with symptoms of diabetic ketoacidosis (DKA) hidden by or mistakenly attributed to viral symptoms.

For clinical presentations where acute DKA might be overlooked, timely assessment of capillary fingerprick/heel prick blood glucose levels is critical. Elevated levels require urgent evaluation.

## In practice

Identify people in high-risk diabetes groups as a priority for focused clinical review, and proactively schedule timely in-person or telehealth appointments.

High-risk groups include people who:[3–6]

- have type 1 diabetes
- are aged ≥65 years
- have insulin-requiring type 2 diabetes
- are using sodium–glucose cotransporter 2 inhibitors (SGLT2; elevated risks of DKA)
- have multimorbidity or diabetes complications
- have unstable HbA1c ≥8.5% or with no recorded HbA1c in the past 6–12 months
- smoke.

However, all people with diabetes may need advice on preventive health, immunisations and sick-day management and timely access (if indicated) to antiviral agents.

Advise people with diabetes:

- on risk-reduction behaviours as per the most current public health messages for COVID-19 and other illnesses, including influenza
- consider proactive PCR pathology forms to allow people to have access to diagnostic pathways
- that home blood pressure monitoring may be needed if in-person assessment is restricted; for example, home blood pressure checks could be suggested in the lead up to a planned appointment (guidance for healthcare professionals is available in an article by Sharman et al[7])
- on appropriate self-monitoring of blood glucose (SMBG) during illnesses (access to the National Diabetes Services Scheme (NDSS)-subsidised blood glucose monitoring for sick-day management is available online)
- to continue usual self-management and reinforce the importance of achieving healthy goals (eg in relation to smoking, nutrition, alcohol and physical activity).

Ask people with diabetes about:

- personal concerns, including mental health related to diabetes distress
- diabetes-specific management concerns and symptoms suggestive of complications (eg vision changes, peripheral neuropathic symptoms, feet and skin problems) requiring timely assessment.

Arrange:

- a written, individualised sick-day management plan (refer to Table 1)
- appropriate immunisation for people with type 2 diabetes as per the Australian Immunisation Handbook recommendations
- timely investigations (eg HbA1c, lipids; remember to record the date of planned follow-up and update your practice's recall/reminder system)
- appropriate prescription requirements
- drivers licensing requirements (commercial licence requirements may need specific action in liaison with specialist teams)
- emergency contact details during illness, including involved diabetes specialists.

# Principles for sick-day management

Provide people with diabetes with a written, individualised sick-day management plan. Hyperglycaemia is a common response and needs management. Antiviral medication may be required as per protocols.

The following principles should guide management:

- Identify the underlying cause (always consider possible undiagnosed type 1 diabetes) and treat as appropriate. Underlying causes include:
  - inter-current illnesses, sepsis, infections (eg skin, urinary tract and chest infections), trauma, acute myocardial infarction and stroke
  - the use of medications such as corticosteroids.
- Increase SMBG if required by individual circumstances (eg people at risk, such as those using insulin or sulfonylureas). Advise on obtaining a blood ketone meter if using SGLT2i agents (refer to the NDSS website for necessary forms).
- Ensure continuity of advice and accessibility – provide telephone or other telehealth access or after-hours support. Guidance on providing telehealth consultations can be found on the RACGP website.
- Review medications (see Table 1).

# Special considerations for sick-day management

**Type 2 diabetes managed with diet alone**

- For worsening glycaemia, consider the introduction of medication and symptomatic management of hyperglycaemia.
- During inter-current illnesses, consider SMBG (refer to the NDSS website for necessary forms).
- People with type 2 diabetes may have impaired body systems that will make recovery slower.
- In addition, people may become dehydrated because of the osmotic diuresis.

**Type 2 diabetes managed with oral or non-insulin glucose lowering medication**

- Worsening glycaemia may require urgent review by the GP or referral to a specialist diabetes service, or hospital emergency department or contact with an endocrinologist.
- Additional insulin (short-acting or prandial) may be temporarily required for persistent and extreme symptomatic hyperglycaemia (≥15 mmol/L), which may also require hospital admission.
- In people with nausea, vomiting and/or diarrhoea:
  - consider temporarily stopping metformin and glucagon-like peptide-1 receptor agonists (GLP-1RAs). Metformin may aggravate these symptoms and GLP-1RAs may aggravate nausea or vomiting. There may be a risk of acute renal impairment due to dehydration
  - review and cease SGLT2i, metformin and GLP-1RAs if acute gastrointestinal illness is present because these medicines may further aggravate dehydration and hypovolaemia
  - note that DKA/euglycaemic DKA[8] should be considered in people who are taking SGLT2i if they display abdominal pain, nausea, vomiting, fatigue or metabolic acidosis.[9] Advise on the timely assessment for blood ketones using a home ketone monitor.

### Type 2 diabetes managed on insulin

- All people should commence SMBG and, if needed, have adequate insulin delivery devices and pen needles and be advised to seek an urgent review by their GP or health professional when unwell or if their blood glucose is ≥15 mmol/L on two consecutive SMBG readings (at two hours apart), as per the action plan. Assess blood ketones in this setting if the person is using SGLT2i or they are pregnant.
- Blood glucose monitoring should be increased to every two to four hours if unwell. People on insulin may need to increase their morning intermediate or long-acting insulin dose by 10–20% if the glucose reading remains elevated and, depending on further blood glucose levels, modify subsequent doses of short-acting insulin during the day. For people on ultra-long-acting basal insulins, including glargine U300 or degludec insulins, GPs may need to seek advice from an appropriate specialist regarding dose adjustment because dose changes may take four to seven days to take effect. Advice on the additional use of oral agents and GLP-1RAs is listed in Table 1.
- Additional blood ketone testing (with appropriate self-monitoring equipment) may be incorporated if the person is using an SGLT2i, if there are symptoms suggestive of ketosis (eg nausea, vomiting, shortness of breath or fruity odour, abdominal pains, altered consciousness) or there is a history of DKA (refer to Emergency management of hyperglycaemia in primary care[8]). This should be a documented strategy in the person's sick-day management plan.
- Note that many people are only on basal insulin or a premixed insulin with oral medications. These people require appropriate medical advice, and may need acute medical advice or a prescription for additional rapid-acting insulin to use as a supplemental insulin dose.[10] If uncertain, consult an appropriate specialist.
- People with gastrointestinal upset who are not eating, but who feel well and continue their usual activities, may need to reduce their insulin according to SMBG readings (especially rapid-acting insulin) to avoid hypoglycaemia.

The RACGP and Australian Diabetes Society's Emergency management of hyperglycaemia in primary care contains important information on managing severe hyperglycaemia.[8]

For more information, refer to the NDSS clinical guiding principles for sick-day management.

| **Table 1. Action plan for management of sick days in people with type 2 diabetes[10,11]** | |
|---|---|
| **Commence action plan** | Commence:<br>• when a person starts to feel unwell for any reason, or<br>• if blood glucose is >15 mmol/L on two consecutive readings |
| **Frequency of blood glucose monitoring** | Monitor every 2–4 hourly, or more frequently if blood glucose is low<br>Ketones to be assessed with persistent hyperglycaemia ≥15 mmol/L on two occasions, two hours apart if using SGLT2i or the person is pregnant |
| **Medication** | Continue insulin or diabetes medications, but assess use of metformin, SGLT2i (dapagliflozin, ertugliflozin and empagliflozin) and GLP-1RAs, which may require cessation if vomiting or dehydration is a concern and recommenced once symptoms have ceased<br>Also review other medications, such as NSAIDs, sulfonylureas, ACEi/ARBs and diuretics |
| **Food and water intake** | There is potential increased risk of hypoglycaemia from insulin and sulfonylureas if appropriate intake of meals is not maintained<br>People should try to maintain their normal meal plans if possible<br>Fluid intake (eg water or oral rehydration solutions) should be increased to prevent dehydration, if appropriate<br>Advise about alternative, easy-to-digest foods, such as soups, if the person cannot tolerate a normal diet (some non-diet soft drinks may provide essential carbohydrate in this situation)<br>If the person is vomiting or has diarrhoea, SGLT2i, GLP-1RAs and metformin should be reviewed or temporarily ceased and appropriate alternative glucose-lowering therapy be advised. Review doses of ACEi/ARBs and diuretics<br>If illness is causing loss of appetite and a marked reduction of carbohydrate intake, SGLT2i should be ceased due to elevated DKA risks<br>If blood glucose is >15 mmol/L, use non-glucose-containing fluids for hydration (assess for ketones if persistent)<br>If blood glucose is <15 mmol/L, use oral rehydration solutions (may contain glucose) if needed<br>If unable to tolerate oral fluids and blood glucose continues to drop, advise them to seek medical care |
| **Seek assistance** | Individuals and support people need to assess whether the person is well enough or able to follow the plan; if not, they should call for help or attend hospital<br>Recommencement of oral intake/normal diet may allow the re-introduction of diabetes medications |

ACEi, angiotensin-converting enzyme inhibitors; ARBs, angiotensin II receptor blockers; GLP-1RA, glucagon-like peptide-1 receptor agonist; NSAIDs, non-steroidal anti-inflammatory drugs; SGLT2i, sodium–glucose cotransporter 2 inhibitor.

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