

Managing glycaemic emergencies

Hypoglycaemia and hyperglycaemia-related emergency presentations such as diabetic ketoacidosis (DKA) and hyperglycaemic hyperosmolar states (HHS) form the basis of this section. Refer to '[Appendix 3. Detailed information on glycaemic emergencies](#)' for more information.

Recommendations

Recommendation	Reference	Grade*
Individuals at risk for hypoglycaemia should be asked about symptomatic and asymptomatic hypoglycaemia at each encounter	1 American Diabetes Association, 2019	C
Glycaemic goals for some older adults might reasonably be relaxed as part of individualised care, but hyperglycaemia leading to symptoms or risk of acute hyperglycaemia complications should be avoided in all patients	1 American Diabetes Association, 2019	C

*Refer to '[Explanation and source of recommendations](#)' for explanations of the levels and grades of evidence.

Clinical context

In patients with type 2 diabetes, very high and low glycaemic states can occur. Both have significant impacts and implications. Patients should be well educated and informed about both states, and an active management plan should be developed.

Hypoglycaemia

Hypoglycaemia is defined as a blood glucose level (BGL) of ≤ 3.9 mmol/L and/or to a level that causes neurogenic and neuroglycopenic symptoms and signs.^{2,3} Rarely, a person who has normal BGLs can display symptoms (known as 'pseudo-hypoglycaemia'); this might occur, for example, when someone has experienced persistent, prolonged hyperglycaemia and the elevated glucose levels have become normalised.^{4,5}

Hypoglycaemia in people with type 2 diabetes is common,⁵ and its impact must not be underestimated, particularly in patients where the morbidity of hypoglycaemia poses particular problems and symptoms may be unrecognised. Higher risk patients include older people, people with renal impairment, people with poor cognitive function and those with low health literacy.^{6,7}

Symptoms of hypoglycaemia vary between people, and include:

- adrenaline activation symptoms, including pale skin, sweating, shaking, palpitations and a feeling of anxiety or dizziness
- neuroglycopenic symptoms, including hunger, change in intellectual processing, confusion and changes in behaviour (eg irritability), paraesthesia, then coma and seizures.

Hypoglycaemia is more common in people taking insulin, alone or in combination with other glucose-lowering medications; it can also occur with sulfonylurea therapy. Other causative factors are insufficient carbohydrate intake, renal impairment and excessive alcohol ingestion, and change in physical activity.

Asymptomatic hypoglycaemia (or biochemical hypoglycaemia) occurs when someone's BGLs are low (≤ 3.9 mmol/L), but the typical symptoms of hypoglycaemia are not present.⁴

Severe hypoglycaemia is defined as signs of hypoglycaemia whereby the person requires the assistance of another person to actively administer corrective action such as carbohydrate, and/or glucagon and glucose infusion. A BGL of < 3.0 mmol/L may carry a risk for severe hypoglycaemia.⁴

Impaired hypoglycaemia awareness occurs where the pathophysiologic symptoms that arise in response to mild or severe hypoglycaemia (refer to [Appendix 3](#)) are reduced or absent and the patient loses the ability to detect the early symptoms of hypoglycaemia. In such cases, symptoms may be recognised by other family members and carers before the patient, and the patient is more likely to have episodes of severe hypoglycaemia.

The development of impaired hypoglycaemia awareness is associated with recurrent episodes of hypoglycaemia and longer duration of type 2 diabetes. Patients with impaired hypoglycaemia awareness may benefit from options such as review of pharmacological and hypoglycaemia management, and continuous or ambulatory glucose monitoring, as this condition may be reversible.

Hyperglycaemia

Hyperglycaemic states include emergencies such as HHS (formerly known as hyperosmolar non-ketotic coma [HONC]) and DKA. Signs of hyperglycaemic states include:

- severe dehydration with polyuria and polydipsia
- abdominal pain, nausea and vomiting
- altered consciousness
- shock
- ketotic breath, in patients with DKA.

These conditions occur due to very unstable glucose levels, implying diabetes management issues or underlying causes such as infection or myocardial infarction, which require concomitant management. DKA is rare in people with type 2 diabetes relative to type 1 diabetes, but it has increased with sodium glucose co-transporter 2 (SGLT2) inhibitor use and is important to recognise ([Appendix 3](#)).

Hyperglycaemic thresholds related to acute elevations of venous or self-monitoring of blood glucose results > 15 mmol/L on two subsequent occasions, two hours apart, with clinical symptoms of metabolic disturbance, should be considered a hyperglycaemic emergency and require assessment and intervention; refer below or to The Royal Australian College of General Practitioners (RACGP) and Australian Diabetes Society (ADS) clinical position statement [Emergency management of hyperglycaemia in primary care](#).

More information about management of hypoglycaemia and hyperglycaemia can be found in [Appendix 3](#). Sick day management of hyperglycaemia is discussed in the section '[Managing risks and other impacts of type 2 diabetes](#)'.

In practice

All patients with type 2 diabetes on insulin and/or sulfonylureas, and their families or carers, should be informed about the risk factors, signs and symptoms of hypoglycaemia and hyperglycaemia, and actions to be taken.

If a patient has experienced severe hypoglycaemia, it may help to identify a carer who can be trained in glucagon administration to assist with early intervention and avoid recurrence. The Australian Diabetes Educators Association sick day management guidelines may be used to assist practical patient management.

You may also refer to the National Diabetes Services Scheme and Diabetes Australia's advice on [sick day management for people with type 2 diabetes](#).

Hypoglycaemia: Practice points

- People can experience episodes of hypoglycaemia at any glycated haemoglobin (HbA1c) level, even if it is at target. Regular BGL monitoring should be used to monitor for hypoglycaemia. Real-time continuous glucose monitoring may help reduce risks of hypoglycaemia, but the cost and availability of this technology and its use in at-risk populations such as older people needs further evaluation.⁸
- De-prescribing of medication may be needed to manage risk of hypoglycaemia.
- Patients are often not forthcoming about symptoms of hypoglycaemia. GPs should therefore ask appropriate questions to detect hypoglycaemia (adrenergic and neuroglycopenic symptoms) to help with interpretation of BGLs. This is particularly important for older people and those with renal dysfunction.
- All people with diabetes with impaired hypoglycaemic awareness should be referred to an endocrinologist or specialist physician with an interest in diabetes for assessment.

Managing hyperglycaemic emergencies: General advice

- Look for an underlying cause – for example, sepsis, myocardial infarction.
- Post-event: review medications, dietary intake and hyperglycaemic and sick day management.

For more detailed information on DKA and HHS, refer to:

- the RACGP and ADS position statement on [Emergency management of hyperglycaemia in primary care](#)
- the ADS alert regarding [periprocedural DKA with SGLT2 inhibitor use](#)
- [Appendix 3](#) for detailed information on glycaemic emergencies.

References

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