

Hypoglycaemia

Standardised care process



Objective

To promote evidence-based practice in the response to a hypoglycaemic episode for older people who live in residential care settings.

Why the identification and management of hypoglycaemia is important

There is an increased risk of hypoglycaemia for residents taking glucose-lowering medicines (for example, gliclazide) or insulin (Dunning, Duggan & Savage 2014). Hypoglycaemia can result in cardiac arrhythmias, falls and fall-related injuries and, in severe cases, death (RACGP 2016). It is important to recognise and treat hypoglycaemia episodes and to reduce the risks of one occurring.

Definitions

BGL: blood glucose level.

Capillary blood glucose levels: on-site measurement of blood glucose levels using a meter and in-date test strips.

Hypoglycaemic episode: blood glucose level lower than 4mmol/L, or low enough to cause symptoms (Therapeutic Guidelines Limited 2017).

Team

Manager, registered nurses (RNs), enrolled nurses (ENs), personal care attendants (PCAs), leisure and lifestyle staff, general practitioner (GP), allied health professionals (such as a physiotherapist, occupational therapist and exercise physiologist), residents and/or family/carers.

Acknowledgement

This standardised care process (SCP) has been developed for public sector residential aged care services (PSRACS) by the Australian Centre for Evidence Based Care (ACEBAC) at La Trobe University through the Department of Health and Human Services Strengthening Care Outcomes for Residents with Evidence (SCORE) initiatives. This SCP is one of a series of priority risk areas reviewed based on the best available evidence in 2017.



Brief standardised care process

Recognition and assessment

- Identify residents who are at risk of developing severe hypoglycaemia.
- Hypoglycaemia should be suspected if the at-risk resident has a blood glucose level of less than 4.0 mmol/L and presents with symptoms.
- Maintain awareness of neuroglycopenic symptoms.
- Check the resident's capillary BGL to confirm the symptoms are due to hypoglycaemia.
- Check the resident's care plan or medication chart for hypoglycaemia management and standing orders.

Interventions

- Respond to hypoglycaemic episodes as per the flow chart in this SCP.
- Report all episodes to the resident's GP and document this.
- Monitor BGL hourly for the first four hours.
- Consult with the GP prior to omitting scheduled insulin or glucose-lowering medications.
- If the BGL rises but the resident does not recover, seek an alternative diagnosis.
- Identify the possible cause of the hypoglycaemic episode.
- Assess the resident's fitness to drive (where appropriate).
- Implement an individualised risk reduction and prevention plan.
- Maintain an appropriately equipped hypoglycaemia management kit.

Referral

- GP
- Emergency medical assistance (ambulance service) if the resident is, or becomes, unconscious
- Dietitian or diabetes educator
- Pharmacist

Evaluation and reassessment

- Medical review: consider a review of resident's target blood glucose range
- Ongoing frequency of BGL monitoring
- Report fluctuations in BGL (outside the resident's target range) to their GP

Resident involvement

- Education about diabetes, including diet and medication management
- Involvement in discussions regarding target blood glucose range
- Involvement in discussions aimed at determining the cause of hypoglycaemic episodes
- Self-monitoring of BGLs and interpreting the BGL pattern if able

Staff knowledge and education

- Diabetes
- Risk factors for hypoglycaemia
- Proactive development of a personalised hypo-management plan
- Recognition of hypoglycaemia in the older person
- Immediate response to a hypoglycaemic episode
- Glucagon administration



Full standardised care process

Recognition

Identify residents who are at risk of developing severe hypoglycaemia:

- residents with diabetes
- residents on insulin therapy or glucose-lowering drugs from the sulfonylurea class of medicines (such as gliclazide).

Assessment

Hypoglycaemia should be suspected if a resident has a blood glucose level of 4.0 mmol/L or lower and presents with any of the following symptoms:

- weakness, trembling or shaking
- dizziness or light-headedness
- sweating
- headache
- hunger
- irritability
- difficulty in concentrating
- numbness or tingling around the fingers, face and lips
- anxiety or fear.

Severe hypoglycaemia with a blood glucose level of 3.0 mmol/L or lower:

- slurred speech
- confusion
- behaviour change (irritability or aggression)
- lack of coordination
- reduced or loss of consciousness
- seizures.

Symptoms to be aware of in older people include:

- napping before meals
- cognitive and behaviour changes
- falls.

It is important to note that older people often present with neuroglycopenic symptoms because the brain does not receive enough glucose during hypoglycaemia.

- Check the resident's capillary blood glucose level to confirm symptoms are due to hypoglycaemia and document this in the resident's medical record and progress notes.

- Check the resident's care plan or medication chart for hypoglycaemia management and a standing order for glucagon.
- Identify the resident's specific signs and symptoms of hypoglycaemia and document these in their diabetes management plan.
- Identify residents who have impaired awareness of hypoglycaemia symptoms. Those at risk will have had diabetes for many years, have experienced several hypoglycaemic episodes and have autonomic neuropathy.

Interventions

The aim is to quickly return and maintain BGLs within the resident's target range, to relieve symptoms and to eliminate risk of injury.

Interventions should include the following:

- Respond immediately to a hypoglycaemic episode as per the *Immediate response to a hypoglycaemic episode* flow chart.
- Report any incident to the resident's GP and document this.
- Monitor the resident's BGL hourly for the first four hours.
- Consult the GP prior to omitting scheduled insulin or glucose-lowering medications.
- If BGL rises but the resident does not recover, consider an alternative diagnosis.
- Seek a possible cause of the hypoglycaemic episode – for example:
 - too much insulin/medication or taking it at the incorrect time in relation to food intake
 - long gaps between meals or a missed meal
 - increased activity/exercise levels
 - excess alcohol
 - changes in medication and/or dosages
 - weight loss or decreased appetite
 - vomiting
 - underlying illness (for example, chronic kidney disease).

Implement or review the resident's existing individualised hypo-risk reduction and prevention plan:

- Establish and document the resident's blood glucose range.
- Undertake regular blood glucose monitoring.
- Consider a review of the resident's medication (for medicines that lower blood glucose), including complementary medicines.
- Consider a dietary review.

Maintain an appropriately equipped hypoglycaemic management kit containing:

- blood glucose monitoring equipment
- carbohydrates
- glucagon 1 mg IM plus equipment for administration (needle, syringe, skin cleansing swab)
- intravenous set (cannula, syringe, sharps container, gloves and skin cleansing swab).

Referral

- Refer for emergency medical assistance (ambulance service) if the resident is, or becomes, unconscious.
- Refer to the GP once treatment has been administered (if BGL was outside the resident's target blood glucose range).
- Referral to a dietitian and/or diabetes educator may assist if insufficient carbohydrate intake is the cause of the hypoglycaemic episodes.
- Refer to a pharmacist for a medication review.

Evaluation and reassessment

- Organise a medical review of the resident's target blood glucose range.
- Monitor BGLs, with the frequency determined in conjunction with the resident and their GP.
- Report BGL fluctuations (outside the resident's target range) to the GP.

Resident involvement

- Education about diabetes, including diet and medication action and management
- Involvement in discussions regarding target BGLs
- Involvement in discussions aimed at determining the cause of hypoglycaemic episodes
- Self-monitoring of BGLs if able

Staff knowledge and education

- Diabetes
- Risk factors for hypoglycaemia and proactive identification of an individual's hypo risk
- Proactive development of a personalised hypo-management plan
- Recognition of hypoglycaemia in the older person
- Immediate response to a hypoglycaemic episode
- Glucagon administration



Evidence base for this standardised care process

Craig ME, Twigg SM, Donaghue KC, Cheung NW, Cameron FJ, Conn J, Jenkins AJ, Silink M 2011, 'National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults', Australian Government Department of Health and Ageing, Canberra.

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Lizarondo L 2015, *Hypoglycaemia in diabetes: management: evidence summaries*, The Joanna Briggs Institute, Adelaide.

National Institute for Health and Care Excellence (NICE) 2015, *Type 1 diabetes in adults: diagnosis and management* (NICE guideline; no. 17), NICE, London.

Therapeutic Guidelines Limited 2017, Diabetes: complications, hypoglycaemia [revised 2017], in eTG complete [internet], TGL, Melbourne, viewed 8 January 2018, <<http://online.tg.org.au>>.

The Royal Australian College of General Practitioners (RACGP) 2016, *General practice management of type 2 diabetes: 2016–18*, RACGP, East Melbourne.

Important note: This SCP is a general resource only and should not be relied upon as an exhaustive or determinative clinical decision-making tool. It is just one element of good clinical care decision making, which also takes into account resident/patient preferences and values. All decisions in relation to resident/patient care should be made by appropriately qualified personnel in each case. To the extent allowed by law, the Department of Health and Human Services and the State of Victoria disclaim all liability for any loss or damage that arises from any use of this SCP.

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Flow chart: Immediate response to a hypoglycaemic episode

To be implemented in both symptomatic and asymptomatic hypoglycaemia			
if symptoms present or if BGL < 4mmol/L, inform RN and check the resident's safety			
Resident tolerates normal diet	Resident requires thickened fluids	Enteral therapy: nasogastric or PEG tube	Resident is drowsy or unconscious. Unable to swallow safely
<p>Administer 15 g of quick-acting carbohydrate orally either:</p> <ul style="list-style-type: none"> • half a can of soft drink (not sugar-free) • half a glass of fruit juice • 6–7 jelly beans • 3 teaspoons of sugar or honey • glucose tablets equivalent to 15 g of carbohydrate 	Prepare glucose gel (15 g on a spoon) and give orally	Administer half a can of soft drink (not sugar-free) or half a glass of fruit juice via nasogastric or PEG tube	<p>Check ABC.</p> <p>Place resident on their side (recovery position).</p> <p>Administer 1 mg glucagon if prescribed (either subcutaneously or intramuscularly as ordered)</p>
Review capillary blood glucose test in 15 minutes			
<p>If blood glucose level < 4mmol/L and the resident is conscious, give another quick-acting carbohydrate (as above)</p> <p>If blood glucose level > 4mmol/L, move to next step</p>			Failure to respond: administer another 1 mg glucagon 20 minutes after first dose
<p>Complex (low GI) carbohydrate:</p> <p>If next meal is more than 15 minutes away give either:</p> <ul style="list-style-type: none"> • a sandwich • a piece of fruit • a glass of milk or soya milk • 2–3 pieces of dried fruit • 1 tub of low-fat yoghurt • 6 small dry biscuits and cheese 	Complex carbohydrate: thickened fluid or immediate vitamised meal	Complex carbohydrate: one serve of nutritional supplement	When resident regains consciousness, give a quick-acting carbohydrate as for conscious person treatment
Test BGL every 1–2 hours over the following four hours and notify the GP if the BGL is outside the resident's reportable range			