

Lessons for Learning Insulin

Purpose

The Clinical Excellence Commission (CEC) Serious Incident Review (SIR) sub-committees are comprised of multidisciplinary clinicians who review serious incidents to identify key learnings, emerging risks, and patient safety issues with broader implications. One of their key roles is to recommend actions to mitigate potential patient safety risks.

Insulin – What the reviews are telling us: System-level challenges

The Clinical Management SIR Sub-Committee has identified recurring incidents involving **insulin**, a high-risk medication. Insulin is a hormone produced by the pancreas and is responsible for the regulation of blood glucose levels. Insulin is most commonly used in the management of patients with diabetes.

This resource has been developed to raise awareness of common safety issues associated with insulin **prescribing, administration, and monitoring**, and to support clinicians in recognising and addressing these risks in their practice. It should be read in conjunction with the [CEC High-Risk Medicine Standard: Insulin](#). Serious incident reviews have identified the following learnings:

Need for regular review of insulin therapy: Insulin requirements can be affected by changing circumstances including acute illness, change in oral intake, sepsis, and renal replacement therapy. This highlights the need for frequent reassessment and clear planning of insulin therapy when circumstances change (for example, during the perioperative period).

Blood glucose monitoring and timely response: Regular monitoring and prompt recognition of hypo- or hyperglycaemia are essential, especially in complex or unstable patients. It is also vital to have clear escalation pathways when readings fall outside target ranges.

Communication and handover: Transitions between settings and teams (for example, admission, discharge, or transfer between the dialysis unit, inpatient ward, operating theatre and critical care area) require clear, documented plans for insulin management, blood glucose monitoring, and clear escalation pathways for hyper- or hypoglycaemia.

Safe prescribing and administration practices: Errors during preparation and administration of insulin, particularly when used to treat hyperkalaemia (due to differences in preparation and route of administration), can lead to significant harm. It is essential for clinicians to be familiar with local protocols and adhere to independent second person check requirements, in accordance with the NSW Health Policy Directive *Medication Handling* ([PD2022_032](#)) and [CEC High-Risk Medicine Standard: Insulin](#).

Person-centred care: Patients with multiple comorbidities can be complex and often require a high level of specialist input within a multidisciplinary team, supported by shared decision-making.

Case 1: Unstable blood glucose control in a complex patient

A patient with multiple comorbidities, including type 1 diabetes (managed with insulin), liver cirrhosis and end-stage renal disease, was admitted for pain management and treatment of suspected sepsis.

Adjustments to insulin therapy in response to changing clinical needs were not made and contributed to multiple episodes of severe hypoglycaemia requiring intravenous glucose administration.

The patient's clinical deterioration was initially attributed to the hypoglycaemic events, however, it was subsequently identified that sepsis was the underlying cause, and the patient later died from septic shock.

Discussion: Complex patients on insulin, with factors that increase their risk of blood glucose instability (eg fluctuating oral intake, infections, acute illness, frailty) require dynamic insulin plans and more frequent blood glucose monitoring. Episodes of hypoglycaemia should be thoroughly investigated to identify the underlying cause.

Adequate planning for patient glucose/insulin requirements is crucial

Case 2: Insulin management during changes in oral intake

A patient with type 2 diabetes (on regular insulin) and end-stage renal disease was admitted for surgical repair of a fractured neck of femur.

Their usual morning dose of subcutaneous biphasic insulin (NovoMix® 30) was administered while they were nil by mouth in preparation for surgery.

The patient initially recovered well from the surgery but was later found unresponsive and hypoglycaemic. Despite prompt treatment and admission to the intensive care unit, the patient suffered hypoglycaemic encephalopathy and died 10 days later.

Discussion: Insulin regimens need to be reviewed and adjusted for patients who are nil by mouth and perioperatively to avoid hypoglycaemia. For patients with type 1 diabetes, basal insulin is to continue even when nil by mouth, unless an intravenous insulin infusion has been commenced. It is recommended that guidelines for the perioperative management of diabetes be in place.

Insulin doses need to be adjusted for patients who are nil by mouth and perioperatively

Case 3: Insulin overdose in treatment of hyperkalaemia

An older person with type 2 diabetes was admitted and treated for hyperkalaemia.

A higher than ordered dose of intravenous insulin was administered as part of the management of hyperkalaemia, which precipitated hypoglycaemia-induced tachyarrhythmia and resulted in a stroke.

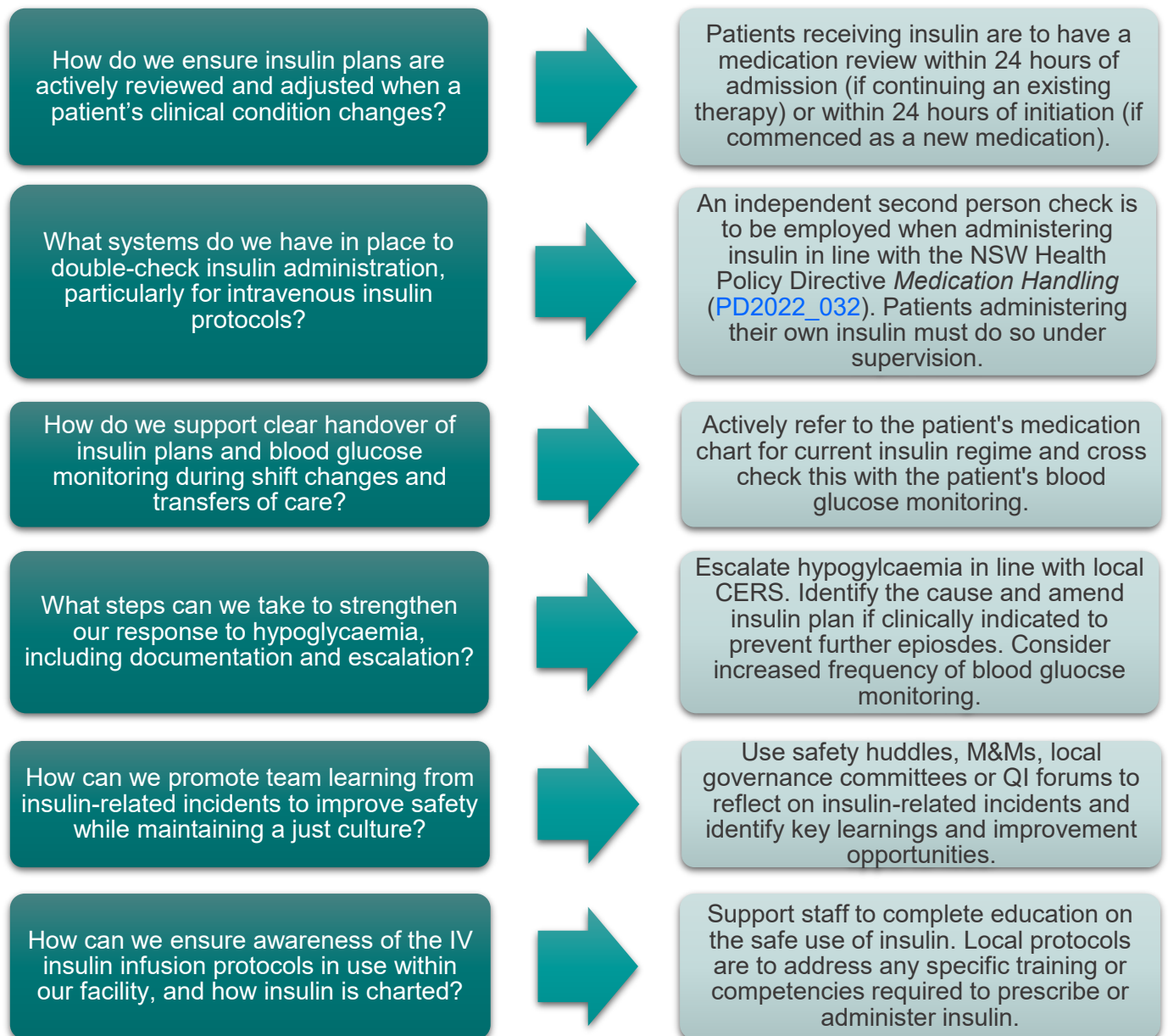
The administration error was caused by a lack of familiarity with the insulin treatment protocol for hyperkalaemia and misinterpretation of the insulin prescription in the electronic prescribing system.

Discussion: It is essential for staff to be familiar with intravenous insulin protocols and adhere to independent second-check processes for insulin administration, in accordance with the NSW Health Policy Directive *Medication Handling* ([PD2022 032](#)) and [CEC High-Risk Medicine Standard: Insulin](#).

Staff need to be familiar with different insulin protocols to manage hypoglycaemia

Reflective prompts for teams and services

Consider these prompts during clinical governance meetings, [Safety Huddles](#), [Morbidity and Mortality Meetings](#), and local quality improvement planning:



Resources

Australian Commission on Safety and Quality in Health Care. (2020). [High-Risk Medicines](#).
 Australian Commission on Safety and Quality in Health Care. (2020). [NSQHS Standards: Medication Safety Standard](#).
 Australian Diabetes Society (ADS). (2022). www.diabetessociety.com.au.
 Clinical Excellence Commission. (n.d.). [Between the Flags](#).
 Clinical Excellence Commission. (2024). [High-Risk Medicine Standard: Insulin](#).
 NSW Health. (2024). High-Risk Medicines Management Policy Directive ([PD2024_006](#)).
 NSW Health (2022). Medication Handling Policy Directive ([PD2022_032](#)).
 NSW Health. My Health Learning. Safe use of insulin: Challenge online course (Course Code 417133532).
 NSW Therapeutic Advisory Group (NSW TAG). (2021). [High risk medicines](#).

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