NSW GOVERNMENT Health

Safety Notice 007/19

High Concentration Insulin Products (Updated)

24 June 2019

Distributed to:

- Chief Executives
- Directors of Clinical Governance
- Associate Director, Private Health Care

Action required by:

- Chief Executives
- Directors of Clinical Governance

We recommend you also inform:

- Drug and Therapeutics Committees
- Diabetes Clinics
- Endocrinologists
- Diabetes Educators
- Directors of Medical Services
- Directors of Nursing
- Directors of Pharmacy
- Emergency Departments
- Preadmission Clinics

Expert Reference Group

Content reviewed by:

- Medication Safety Expert Advisory Committee
- ACI Endocrinology Network

Clinical Excellence Commission

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http://internal.health.nsw.gov.au/quality/sabs/

Review date

June 2020

Insulin is a high-risk medicine which can cause harm if misused or used in error.[1] In NSW hospitals, insulin is the third most common medicine involved in medication incidents.

Most insulin formulations are presented in a standard concentration of **100 units/mL** and are administered using a 100 units/mL insulin syringe, or a dedicated injector pen. The introduction of high concentration insulin products has increased the potential for errors and serious harm to patients.

Currently, there are three high concentration insulin products available in Australia, with more expected to become available in the future:

- Humulin® R U-500 (human neutral insulin) **500 units/mL** is available as a disposable injector pen through the Special Access Scheme and is **five** times more concentrated than standard human neutral insulin products Actrapid® 100 units/mL and Humulin® R 100 units/mL.

- Toujeo® (insulin glargine) **300 units/mL** is available as a disposable injector pen through PBS prescription and is approximately **three** times more concentrated than the standard insulin glargine product Lantus® 100 units/mL. Note that while both Lantus® and Toujeo® products contain insulin glargine, they cannot be used interchangeably.

- Humalog® U200 (insulin lispro) **200 units/mL** is available as a disposal injector pen through PBS prescription and is **two** times more concentrated than the standard insulin lispro product Humalog® 100 units/mL.

There are a range of clinical reasons for using high concentration insulin. For example, some diabetic patients with severe insulin resistance require high doses of insulin and use these products to decrease their daily injection volume of insulin. These products are usually safely self-administered by patients at home. However, the lack of staff familiarity with these products can result in **2 to 5 fold** dosing errors when these patients are admitted to hospital.

In Australia, a number of actual and near miss incidents have been reported where inpatients have received incorrect doses of high concentration insulin.

Suggested actions by Local Health Districts/Speciality Networks

1. Forward information to relevant clinicians, clinical departments/units, and Drug and Therapeutics Committees (or similar) for action.
2. Conduct a local risk assessment on the use of high concentration insulin products in each area where they are stored, or may potentially be used, and implement strategies to reduce errors. Strategies could include:

   Medication Orders

   - Ensure medication orders for high concentration insulin products include the full

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Suggested actions by Local Health Districts/Specialty Networks

- brand name and strength. It should be noted that whilst Lantus and Toujeo both contain insulin glargine, they cannot be used interchangeably
- Ensure that the insulin dose is clear to all staff involved in the handling of the high concentration insulin
- Ensure that configuration of high concentration insulins appears consistently across electronic prescribing systems to minimise risk of selection error during prescribing and administration. High concentration insulin products should be clearly distinguishable from standard concentration insulin products
- Consider local options to flag on the electronic medical record or relevant paper charts that a patient is using a high concentration insulin

Storage and Supply

- Hospital supply of high concentration insulin products should only occur through individual patient dispensing
- Dispensing labels for high concentration insulin products should be affixed to the body of the pen (not the removable cap)
- Ensure that high concentration insulin is stored separately from standard insulin products
- Use warning labels on high concentration insulin product packaging and shelving areas

Administration

- Whenever possible, patients should **self-administer** their high concentration insulin under supervision, in accordance with NSW Health Policy on Medication Handling in NSW Public Health Facilities[2]
- A patient's own high concentration insulin should be used until individually dispensed hospital stock arrives
- **Nursing staff should be educated about the correct use of safety pen needles used at their facility.** Variations between needle products have previously been missed, leading to patient harm**.** Refer to '*Safe Administration of Medication Pen Devices*' for more detail
- Staff administering high concentration insulin must use a new safety pen needle for each dose
- **A syringe should never be used to withdraw any medication from pen devices due to the high potential for dosing errors**
- **Do not perform dose conversions** as the pen device automatically performs this function
- Use reminders that specify the mandatory requirement for an independent double check when administering insulin.

Handover

- Ensure the treating team consults the local Endocrinology team and/or the Endocrinologist who normally manages the patient's high concentration insulin as soon as possible
- Ensure that nursing staff communicate the use of high concentration insulin at handover

3. Ensure appropriate clinical support is available after-hours for managing the use of high concentration insulin products.

4. Monitor and document adverse outcomes associated with the use of high concentration insulin.

5. Ensure a system is in place to document and review actions taken.

References

1. NSW Health Policy Directive PD2015_029 High-Risk Medicines Management Policy

2. NSW Health Policy Directive PD2013_043 Medication Handling in NSW Public Health Facilities

3. Clinical Excellence Commission, Safe Administration of Medication Pen Devices