Insulin Safety – Prescribing & Dispensing Insulin Safely

Summary

In recent years there have been several new insulin products available in the UK including biosimilars and high strength insulins, many of which are also included in the South East London (SEL) Joint Medicines formulary.

In 2017, NICE published 'Safer Insulin Prescribing', a document to support safe practice around insulin use. The document shared statistics from a 2011 National Patient Safety alert (NPSA) highlighting that 60% of 16,600 insulin related adverse effects were due to the wrong insulin product being used, omitted or delayed doses and wrong insulin dose.

Across South East London there are different prescribing support systems in place to aid safe prescribing of insulin. Although these will help to reduce the risk of errors, this does not take away the need for routine safe practice when prescribing and dispensing insulin to minimise the risks of medication errors and/or near misses. This document highlights some of the key areas to support safe practice when prescribing and dispensing insulin.

Summary of key insulin safety prescribing and dispensing points

1. •Ensure all insulins are prescribed by brand
2. •Ensure the correct insulin strength has been selected when prescribing and dispensing
3. •Ensure the correct insulin device has been selected and the patient has been trained how to use the device
4. •**Never** use the abbreviations 'U' or 'IU'. Instead use the word 'units' for insulin doses
5. •Ensure the correct consumables have been prescribed and dispensed for the insulin device e.g. insulin pen needles for pre-filled pens, sharps boxes
6. •Minimise risk of picking errors when prescribing and dispensing
7. •Ensure the quantity of insulin prescribed is appropriate for the individual patients needs

Patients should be supported at each point of contact to ensure they have the right insulin (including the right device) at the right dose, the right way and at the right time. Where any discrepancies arise, check with the patient, initiating team, GP practice or other documentation such as the insulin passport.

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1 • Ensure all insulins are prescribed by brand

Some of the newer insulins that have been launched in the UK are insulins that have the same generic name as other existing insulin preparations however differ in a number of important ways. These differences are detailed below:

1. ***Biosimilar insulins***

- Although biosimilar insulins are highly similar to the original product (the biological reference medicine), they are not interchangeable with the original product without vigilant monitoring to assess changes in glycaemic control. Therefore, patients should receive the same brand each time they have their insulin prescribed and dispensed. The MHRA add that:

  "Pharmacists should challenge any prescriptions for insulin by its generic rather than trade name, to ensure that the product dispensed is the correct one intended for the patient".

  Currently there are three insulins that have biosimilar insulins available (see table 1 below) with more planned to be introduced in the future.

  Table 1:

Original insulin product (biological reference medicine)	***Biosimilar insulin(s)***
Lantus 100 units/ml insulin	Abasaglar 100 units/ml insulin Semglee 100 units/ml insulin*
Humalog 100 units/ml insulin	Admelog 100units/ml insulin* (previously known as Insulin lispro Sanofi 100units/ml*)
NovoRapid 100units/ml insulin	Trurapi 100units/ml insulin*

*not currently on SEL formulary

  As additional biosimilar preparations are launched, the risks associated with generic prescribing of insulin will increase.

2. ***Three branded preparations of prandial insulin aspart 100 units/ml with two different release profiles***

- There are now three preparations of prandial insulin aspart 100 units/ml insulin available:
  - NovoRapid® 100units/ml insulin
  - Trurapi® 100units/ml insulin*
  - Fiasp® 100units/ml insulin
- NovoRapid® 100units/ml insulin and Fiasp® 100units/ml insulin are currently on the SEL Joint Medicines Formulary

- The different insulin aspart 100 units/ml preparations are not interchangeable due to the differences in bioavailability. Fiasp® 100units/ml insulin has a quicker onset of action and shorter duration of action.

  If prescriptions are written as generic insulin aspart 100units/ml, the patient could be dispensed with any of the three preparations which may result in the patient experiencing hypoglycaemia due to the different release profiles

It is essential that all insulins are prescribed by brand to ensure the patient obtains the correct insulin and to minimise the risks of medication errors and/or near misses with insulin. Challenge all prescriptions written for generic insulin.

2 • Ensure the correct insulin strength has been selected when prescribing and dispensing.

- The majority of insulins available on the UK market are of 100units/ml strength. Over the past few years, a number of higher strength insulins have become available for patients with large daily insulin requirements to reduce the number and volume of injections.
- **Switching between different strengths of the same insulin should not occur unless the patient is under supervision of a diabetes specialist as dosage changes and close blood glucose monitoring is required, along with education about the higher strength insulin and device.**
- Listed below are higher strength insulins on the local formulary.

Toujeo® 300units/ml insulin

- Toujeo® 300units/ml insulin (insulin glargine 300units/ml) is **not** bioequivalent to insulin glargine 100 units/ml (Lantus® 100units/ml, Abasaglar® 100units/ml or Semglee® 100 units/ml insulin)

Tresiba® 200 units/ml insulin

- Tresiba® 200 units/ml insulin (insulin degludec 200 units/ml) was introduced onto the UK market in 2013
- Tresiba® 100 units/ml insulin (insulin degludec 100 units/ml) is also available.

Humalog® 200units/ml insulin (not currently on SEL formulary)

- Humalog®200units/ml insulin (insulin lispro 200 units/ml insulin) was introduced onto the UK market in 2015
- Humalog® 100 units/ml insulin (insulin lispro 100 units/ml) is also available.

To minimise the risks of medication errors and/or near misses with insulin, ensure prescriptions are written by brand and ensure the correct strength of insulin has been selected throughout the prescribing, dispensing and labelling process.

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3

- Ensure the correct insulin device has been selected and the patient has been trained how to use the device

There are different types of insulin devices available for different insulins. Selection of the correct device is essential as patients will have been trained on the use of a particular device type.

With the introduction of high strength insulins (detailed above) there are some key differences in insulin devices not only with how the device works but also with:

- the number of insulin units available in the pen
- how patients 'dial up' the required drug dose on the pre-filled pen
- 'dose adjustment steps'.

Examples are given in the table below:

	Toujeo® 300units/ml **SoloStar 1.5ml** insulin pen	Toujeo® 300units/ml **DoubleStar 3ml** insulin pen	Tresiba® 100units/ml **FlexTouch 3ml** insulin pen	Tresiba® 200units/ml **FlexTouch 3ml** insulin pen
				
Number of units in each pen	450 units	900 units	300 units	600 units
Single dose range per injection	1-80 units	2-160 units	1-80 units	2-160 units
No. units per dose adjustment step	1 unit	2 units	1 unit	2 units

To minimise the risks of medication errors and/or near misses with insulin, ensure the correct insulin device has been selected and the patient has been trained how to use the device.

If further training or support is required, this can be provided by community pharmacists or refer the patient back to their prescriber/GP practice/diabetes team.

4

- Never use abbreviations such as 'U' or 'IU'. Instead use the word 'units' for insulin doses

In 2010 a National Safety alert was issued in response to a number of errors occurring when the abbreviations 'U' or 'IU' were used to document insulin units. When abbreviations are added to the intended dose, this can be misread e.g. 10U may be misread as 100.

To prevent errors with insulin dosing, please ensure the term 'units' is used in all communication regarding insulin doses.

If a dose is not specified in patient's records/clinic letters, check with patient they are aware of dose to be taken. Where clarity is required, contact the patient's diabetes healthcare professional/prescriber.

5

- Ensure the correct consumables have been prescribed and dispensed for the insulin device e.g. insulin pen needles for pre-filled pens, sharps boxes

- A 2016 National safety alert was issued in response to a number of incidents linked to withdrawing insulin from insulin pens or refill cartridges using insulin syringes and needles. Insulin syringes are suitable only for calculating doses of standard 100units/ml insulin
- **Never** extract insulin from a pen or refill cartridge with an insulin syringe and needle as this can lead to significant and potentially fatal overdose, especially with higher strength pens or cartridges. Extracting insulin in this way also risks damaging the device's mechanism.
- **Extracting insulin from a cartridge or insulin pen using insulin syringes and needles should never occur.**

Please ensure the correct consumables are prescribed and dispensed alongside insulin preparations to ensure safe administration of insulin and disposal of sharps. For information on sharps waste for patients, please see our local guidance.

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6 • Minimise risk of picking errors when prescribing and dispensing

To minimise risk of picking errors when prescribing

- Undertake medicines reconciliation and ensure only currently used insulin(s) are listed on the current list of medications
- When adding a new insulin and selecting the insulin from the electronic prescribing system pick list, ensure the right insulin, right strength and right device has been selected

To minimise risk of picking errors when dispensing

- Ensure that organising/storing of insulins allows for insulins with similar visual appearance and/or name and/or strength to be separated appropriately to minimise errors during the selection process.
- When selecting the insulin from the electronic dispensing system pick list, ensure the right insulin, right strength and right device has been selected
- If no brand is specified, check with patient and/or prescriber which brand is to be dispensed and request any future prescriptions are changed to brand prescribing.
- Carefully check strength of insulin selected from stock against prescription and then the electronic dispensing system, and patient's insulin passport if they have this.
- Check on handout to patient that right insulin has been issued. Where any discrepancies arise, check with the initiating team, GP practice or other documentation such as the insulin passport.

7 • Ensure the quantity of insulin prescribed is appropriate for the individual patients needs

- Insulin quantities should meet the needs of the individual patient
- In addition to the daily dose required, quantities prescribed should take into consideration requirements for test shots prior to injection, increased requirements during illness and dose titrations required to optimise glucose levels
- Where possible and when in line with the principle of prescribing appropriate quantities, insulin should be prescribed and dispensed in whole boxes (traditionally packs of 5 for cartridges and packs of 3 or 5 for pens, dependent on the product). Where split packs of insulin are dispensed, community pharmacists must ensure that a patient information leaflet is provided to the patient at the point of dispensing.

References

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- Patient_Safety_Alert_-_Withdrawing_insulin_from_pen_devices.pdf (england.nhs.uk) NHS/PSA/W/ 2016/011
- Patient Safety Alert- The adult patient's passport to safer use of insulin – Accessed at 2011-NRLS-1283-Insulin-Alert-2011.03-v1.pdf (sps.nhs.uk) on 18.05.21

Resources:

TREND UK: New insulin safety leaflet: A5_Insulin_TREND_FINAL.pdf (diabetes-resources-production.s3-eu-west-1.amazonaws.com)

NHS England Improvement: Patient leaflet 'The Safe use of Insulin and You': Safe-use-of-insulin-and-you-patient-info-booklet.pdf (england.nhs.uk)

Free e-learning module from Primary Care Diabetes Society in association with TREND UK: The six steps to insulin safety - DOTN (diabetesonthenet.com)