High strength, fixed combination and biosimilar insulin products: minimizing the risk of medication error

From: Medicines and Healthcare Products Regulatory Agency
Published: 29 April 2015
Therapeutic area: Endocrinology, diabetology and metabolism

Several new high strength insulin products are now on the market. The European Medicines Agency is consulting on guidance to minimize the risk of medication error.

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Public consultation

It is likely that further such insulin products will come to market over the next few years. This draft guidance summarises ways to minimise the risk of medication errors with high strength, fixed combination and biosimilar insulin products already on the market. We encourage you to comment on the risk minimisation strategy for high strength and fixed combination insulin products which is being developed by the European Medicines Agency. The consultation is open until 14 June 2015.

Overview of products on the market

Several new insulin products have come to market recently; three high strength insulins which have concentrations greater than 100 units/mL (Tresiba▼, Humalog, Toujeo▼), a fixed combination of insulin degludec and liraglutide (Xultophy▼) and a biosimilar of insulin glargine (Abasaglar▼).

Details of the new products are as follows:

<table>
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<tr>
<th>Key feature</th>
<th>Active substance</th>
<th>Brand name</th>
<th>Strengths available</th>
<th>Administration device</th>
</tr>
</thead>
<tbody>
<tr>
<td>High strength</td>
<td>Insulin degludec</td>
<td>Tresiba▼</td>
<td>100 units/mL; 200 units/mL</td>
<td>FlexTouch prefilled pen</td>
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<tr>
<td></td>
<td>Insulin lispro</td>
<td>Humalog</td>
<td>100 units/mL; 200 units/mL</td>
<td>KwikPen prefilled pen</td>
</tr>
</tbody>
</table>
### Key feature | Active substance | Brand name | Strengths available | Administration device
---|---|---|---|---
Insulin glargine | Lantus | 100 units/mL | SoloSTAR prefilled pen
Toujeo▼ | 300 units/mL
Fixed combination | Insulin degludec and liraglutide (Not Yet in US) | Xultophy▼ | 100 units/mL of insulin degludec and 3.6 mg/mL of liraglutide | Prefilled pen
Biosimilar | Insulin glargine (Not Yet in US) | Abasaglar▼ | 100 units/mL of insulin glargine | Lilly reusable pen
| cartridge | KwikPen prefilled pen

Healthcare professionals and patients need to understand the insulin strength of these products and how to use them correctly to minimise the risk of medication errors such as the wrong insulin dose being administered.

Details on the correct use of these products are given in the [further information](#) below.

## High strength insulin products

High strength insulin products have been developed for patients with large daily insulin requirements to reduce the number and volume of injections.

### The dose step

The ‘dose step’ is a new term to define how patients dial up the required drug dose on the prefilled pen.

For Lantus, Toujeo and both strengths of Humalog:

- one dose step on the prefilled pen is equivalent to one unit of insulin.

In contrast, with Tresiba:

- one dose step on the 100 units/mL pen is equivalent to one unit of Tresiba
- one dose step on the 200 units/mL pen is equivalent to 2 units of Tresiba

For further information on reducing risk of medication error with Tresiba, see the April 2013 Drug Safety Update article on Tresiba, the letter on Tresiba sent to healthcare professionals, and the Tresiba summary of product characteristics.

### Dose conversion when switching between standard and high strength insulin products

For all the insulin products in the table above, the required dose is displayed in the dose counter window of the prefilled pen.

For Humalog 100 and 200 units/mL KwikPens, and for Tresiba 100 and 200 units/mL FlexTouch pens:

- there is **no need for dose conversion** when transferring patients from the standard to high strength version or vice versa.

However, Toujeo is **not bioequivalent** to Lantus:
• dose adjustment is needed when patients are switched from Lantus or other basal insulins to Toujeo or vice versa - for dose conversion instructions, see the Toujeo guidance for healthcare professionals.

Xultophy▼: insulin in fixed combination with liraglutide

Xultophy is the first product to combine insulin with another injectable treatment; it combines insulin degludec 100 units/mL with liraglutide 3.6 mg/mL in a prefilled pen. Liraglutide (Victoza) is a glucagon-like peptide-1 (GLP-1) receptor agonist licensed for the treatment of type 2 diabetes. One dose step on the Xultophy prefilled pen is equivalent to one unit of insulin degludec and 0.036 mg of liraglutide. For further information, see the Xultophy summary of product characteristics.

Abasaglar▼: biosimilar insulin

Abasaglar is a biosimilar medicine based on insulin glargine 100 units/mL (Lantus) and is licensed for the treatment of diabetes in adults, adolescents, and children aged 2 years and above. Abasaglar has been shown to be equivalent to Lantus in its pharmacokinetic and pharmacodynamic properties. However, as with other biosimilar medicines, some dose adjustment may be needed for some patients. For further information, see the Abasaglar summary of product characteristics.

Advice for healthcare professionals:

Before starting treatment with a high strength, fixed combination or biosimilar insulin product:

• consult the summary of product characteristics and any educational material – see below
• ensure that patients read and understand the patient leaflet and any patient education material
• ensure that patients receive appropriate training on the correct use of the product
• give patients a patient booklet and Insulin Passport (or safety card) – see below
• warn patients only to use insulin as they have been trained because using it any other way may result in a dangerous overdose or underdose

Monitor glucose levels closely after starting a new treatment and in the following weeks. You may need to adjust doses and timing of concurrent rapid acting or short acting insulin products and other antidiabetic treatments.

Further information

Toujeo guidance for healthcare professionals April 2015

Toujeo guidance for patients and carers April 2015

Letter on Humalog sent to healthcare professionals on 16 February 2015

Letter on Tresiba sent to healthcare professionals in January 2013

Drug Safety Update article on reducing risk of medication error with Tresiba

Xultophy summary of product characteristics

Abasaglar summary of product characteristics