



What is the Intended Place in Therapy for High Concentrated Insulin?

Residents, who require high doses of insulin daily in order to maintain adequate glycemic control, now have more treatment options available in order to reduce the number of injections they receive. Because of the differences in insulin concentration, residents and nurses should be further educated on dosage, administration, and safety precautions with these insulins.

This reference guide discusses unique features of the available concentrated insulins, indications, administration techniques, and storage guidelines.

Please do not hesitate to contact your Remedi pharmacist for more information or if you have any questions.

High Concentrated Insulin Reference

U-500 Humulin R (Short Acting)

- An adjunct in therapy to diet and exercise in both Type 1 and 2 Diabetes Mellitus
 - Patients requiring more than 200 units of regular insulin per day or
 - Patients who have severe insulin resistance and require more than 200 units of insulin per day
- **FIVE TIMES** more concentrated in 1 mL than standard U-100 Humulin R
 - Patients can inject smaller amounts and still get the prescribed dose
 - Smaller amounts being administered equals less liquid used compared with the usual U-100 Humulin R
 - May result in less injections per day

Administration:

- Two-three times per day before meals
- Onset of action: 0.5 h, duration: up to 24 h
 - After injection, patients need to eat a meal within 30 minutes to avoid hypoglycemia
- Dosage of medication is individualized per patient
- Average range of total daily insulin required for a user with severe insulin resistance is between 0.5-1.0 unit/kg/day
 - Example: 90 kg female would require between 45-90 units of U-500 Humulin R per day
- Administer subcutaneously (SQ) in the abdominal wall, thigh, gluteal region, or upper arm
- Should **NOT** be given IM/IV
- Should **NOT** be mixed with other insulin (no safety data available)



Safety Issues and Identification Differences:

- Open and unopened vials of U-500 should be refrigerated and opened vials should be discarded at 40 days after opening
- A dedicated syringe is **NOT** available for U-500 Humulin R
 - Manufacturer recommends either a U-100 insulin syringe or tuberculin/allergy syringe
 - **Education is crucial with the patient and/or nurse for drawing up the correct prescribed dose**
 - **The dose designations on the recommended syringes are NOT the same and if used inaccurately, the patient may get more or less insulin than desired and result in either hyperglycemia or extreme hypoglycemia**
- * **Tuberculin/Allergy syringe**: Actual dose prescribed divided by 500 = volume (mL) in tuberculin syringe
 - Example 25 units: $25/500 = 0.05$ mL
- * **U-100 syringe**: Actual dose prescribed divided by 5 = units on U-100 syringe
 - Example 25 units: $25/5 = 5$ unit marking
- Identification of the U-500 Humulin R versus the Standard U-100 vial
 - The box and bottle have diagonal brown stripes
 - The label is black and white, with other specific information written in red

High Concentrated Insulin Reference

Humalog U-200 Insulin Lispro (Rapid Acting)

- Does **NOT** come in a vial, but as a KwikPen
- Prefilled pen with 3 mL of Humalog in a concentration of 200 units per mL, to total 600 units versus the standard KwikPen that has 3 mL of 100 unit/mL or 300 units total
- First pen of its kind to include **double the dose** of meal time insulin
- Indicated for patients, who use three or more mealtime insulin pens per month
 - Patients change pens half as often and use fewer pens per month with the U-200

Administration:

- Dosage is based upon metabolic needs, glucose, monitoring, and glycemic control goal
 - Administer either 15 minutes **prior** to a meal or **immediately after** a meal SQ in the abdominal wall, thigh, gluteal region, or upper arm
 - Onset of action: 0.5 h, duration: < 6 h
- Should not be mixed with other insulins
- A 2 unit air shot is required prior to each injection to ensure pen is ready for use and air bubbles extracted
- After priming, dial to prescribed dose
 - Even numbers are printed in dosage window
 - Odd numbers, after the number 1, are shown between the even numbers with a horizontal line
- Once the injection is given and dosage window counts down to zero, hold pen in skin for 5 seconds, to ensure the full dose administered
- Refrigerate unopened pens; opened pens can be stored at room temperature; discard after 28 days



Humalog U-200 KwikPen

High Concentrated Insulin Reference

Toujeo® Insulin Glargine 300 Units/mL SoloStar Pen (Long Acting)

- **LONG** acting insulin indicated to improve glycemic control in patients diagnosed with Diabetes Mellitus
- Contains the same active ingredient as Lantus, but with a higher concentration of 300 units/mL
- Indicated for those individuals who require higher doses of basal insulin to reduce number of vials used per month

Administration

- Dosing depends on individual metabolic needs, glucose monitoring, and glycemic control goal
 - Type 1 DM: Dose should be approximately 33-50% of the total daily insulin requirement
 - Type 2 DM: 0.2 units/kg SQ daily
 - Insulin naïve patients are started at a lower dosage
 - If going from another long acting or twice daily basal insulin, the dosage may remain the same
 - If switching from Lantus to Toujeo, a higher dose of Toujeo may be needed to maintain glycemic goal
- Dosed **ONCE** daily, at any time of day-but given at same time daily
- Onset of action: 6 h, duration: 24-36 h
- Administer SQ into the abdomen (anywhere except a two inch radius from the navel), upper arm, or thigh
- A 3 unit air shot is required prior to each injection to ensure pen is ready for use and air bubbles extracted
- After priming, dial to prescribed dose
 - Even numbers are printed in dosage window
 - Odd numbers, after the number 1, are shown between the even numbers with a horizontal line
- Once the injection is given and dosage window counts down to zero, hold pen in skin for 5 seconds, to ensure the full dose administered
- Refrigerate unopened pens; opened pens can be stored at room temperature; discard after 28 days



With all insulins, please make sure that each pen or vial is single patient use only and remember to rotate injection sites to avoid lipodystrophy.

References:

- www.humulin.com
- www.humalog.com
- www.toujeo.com