



# Rx Update

April 2007

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## REVIEW OF INSULIN PRODUCTS

During the past few years, a number of new insulin products have been introduced to the market for the treatment of diabetes, while several have been removed from the market. The onset, peak, and duration of action after subcutaneous injection of available insulin preparations on the UIHC Formulary are listed in the table below. The stability and compatibility of various insulin mixes is also shown.

Insulin Type	Brand Name(s)	Onset (hours)	Peak (hours)	Duration (hours)	Physical Appearance	Room Temperature Stability In-Use (Vial)	Compatibility Mixed with other Insulins
<b>Rapid-Acting</b>							
Insulin Aspart	NovoLog <sup>®</sup>	0.25	1 to 3	3 to 5	Clear	28 days	NPH
Insulin Lispro	Humalog <sup>®</sup>	0.25	0.5 to 1.5	2 to 5	Clear	28 days	NPH
<b>Short-Acting</b>							
Regular Human Insulin	Novolin R <sup>®</sup> Humulin R <sup>®</sup>	0.5 to 1	2 to 5	8 to 12	Clear	28 days	NPH
<b>Intermediate-Acting</b>							
Isophane Human Insulin (NPH)	Novolin N <sup>®</sup> Humulin N <sup>®</sup>	1 to 2	4 to 12	16 to 24	Cloudy	28 days	Aspart, Lispro, Regular
<b>Long-Acting</b>							
Insulin Detemir	Levemir <sup>®</sup>	1 to 2 (dose dependent)	6 to 8 (blunted)	12 to 23.2 (dose dependent)	Clear	28 days (UIHC) 42 days (patient home)	None
Insulin Glargine	Lantus <sup>®</sup>	1	4 to 5 (blunted)	24	Clear	28 days	None

There are other important aspects to the dosing and administration of insulins. These include:

- **Insulin glargine** (Lantus<sup>®</sup>) and **insulin detemir** (Levemir<sup>®</sup>) must NOT be administered IV and cannot be mixed with any other insulin products. NPH insulin is a suspension that must not be administered IV.
- **Insulin glargine** is a clear solution that forms a precipitate under the skin which results in delayed absorption and a 24-hour effect. Insulin glargine may be administered once daily at any time during the day, but should be administered consistently at the same time every day.
- **Insulin detemir** is a clear solution which reversibly binds to albumin in the blood causing a delayed release. Insulin detemir is commonly administered in two divided doses in the morning and evening; some patients may adequately respond to once daily dosing with the evening meal or at bedtime.
- When mixing **regular human insulin**, **insulin aspart**, or **insulin lispro** with NPH insulin, they should be drawn into the syringe first (before the NPH insulin). Remember that clear solutions are always drawn up first.
- Rapid-acting insulins are taken directly before meals. **Insulin aspart** should be taken within 15 minutes of a meal or immediately after a meal. **Insulin lispro** should be taken 5 to 10 minutes before a meal. They have a quick onset and short duration of action. Regular insulin does not act as quickly, but lasts slightly longer. **Regular insulin** should be taken 30 to 60 minutes before a meal.
- There is no information on the stability of insulin detemir, insulin aspart, or insulin lispro stored in syringes. They are to be administered immediately after being drawn up. Insulin glargine may become turbid in a syringe after several days, possibly reacting to the silicone in the barrel of they syringe. It should not be stored in a syringe.
- Humulin<sup>®</sup> and Novolin<sup>®</sup> brands are considered therapeutically equivalent by the Pharmacy and Therapeutics Subcommittee. Therefore, only one brand will be stocked.