## Insulin

<table>
<thead>
<tr>
<th>Insulin</th>
<th>Manufacturer</th>
<th>Onset (approximately)</th>
<th>Peak (approximately)</th>
<th>Duration (approximately)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RAPID ACTING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NovoLog® Vial</td>
<td>Novo Nordisk</td>
<td>10–20 minutes</td>
<td>1–3 hours</td>
<td>3–5 hours</td>
</tr>
<tr>
<td>NovoLog® PenFill®</td>
<td>Novo Nordisk</td>
<td>10–20 minutes</td>
<td>1–3 hours</td>
<td>3–5 hours</td>
</tr>
<tr>
<td>NovoLog® FlexPen (prefilled)</td>
<td>Novo Nordisk</td>
<td>10–20 minutes</td>
<td>1–3 hours</td>
<td>3–5 hours</td>
</tr>
<tr>
<td>Apidra® (insulin aspart [rDNA origin] injection)</td>
<td>Sanofi</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
<td>5 hours or less</td>
</tr>
<tr>
<td>Apidra® SoloSTAR® (prefilled)</td>
<td>Sanofi</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
<td>5 hours or less</td>
</tr>
<tr>
<td>Apidra® Cartridge</td>
<td>Sanofi</td>
<td>Immediate</td>
<td>12–15 minutes</td>
<td>180 minutes</td>
</tr>
<tr>
<td>Afrezza® (Insulin human Inhalation Powder)</td>
<td>MannKind</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humalog® Vial (insulin lispro injection, USP [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
<td>5 hours or less</td>
</tr>
<tr>
<td>Humalog® Cartridge (insulin lispro injection, USP [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–3.0 hours</td>
<td>5 hours or less</td>
</tr>
<tr>
<td>Humalog® KwikPen™ (insulin lispro injection, USP [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–3.0 hours</td>
<td>5 hours or less</td>
</tr>
<tr>
<td>Humalog® KwikPen™ U-200</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–3.0 hours</td>
<td>5 hours or less</td>
</tr>
<tr>
<td><strong>SHORT ACTING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novolin® R Vial (Regular human insulin)</td>
<td>Novo Nordisk</td>
<td>30 minutes</td>
<td>1.5–3.5 hours</td>
<td>8 hours</td>
</tr>
<tr>
<td>Humulin® R (Regular insulin human injection, USP [rDNA origin])</td>
<td>Lilly</td>
<td>30–60 minutes</td>
<td>2–4 hours</td>
<td>5–8 hours</td>
</tr>
<tr>
<td>Humulin® U-500 Humulin® R (U-500) Vial (regular U-500 [concentrated] insulin human injection, USP [rDNA origin])</td>
<td>Lilly</td>
<td>30 minutes</td>
<td>N/A</td>
<td>Up to 24 hours</td>
</tr>
<tr>
<td><strong>INTERMEDIATE ACTING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novolin® N Vial (NPH human insulin isophane)</td>
<td>Novo Nordisk</td>
<td>1.5 hours</td>
<td>4–12 hours</td>
<td>24 hours</td>
</tr>
<tr>
<td>Humulin® N (NPH) Vial (NPH human insulin [rDNA origin] isophane suspension)</td>
<td>Lilly</td>
<td>1–2 hours</td>
<td>2–8 hours</td>
<td>14–24 hours</td>
</tr>
<tr>
<td>Humulin® N (NPH) KwikPen™ (prefilled) (NPH human insulin [rDNA origin] isophane suspension)</td>
<td>Lilly</td>
<td>1–2 hours</td>
<td>2–8 hours</td>
<td>14–24 hours</td>
</tr>
</tbody>
</table>

All insulins listed are U-100 strength. All insulins should be refrigerated at 36°–46° F prior to use.

- a: Also available in U-500 by prescription only.
- b: Lantus and Levemir release at a relatively constant rate over a 24-hour period.
- c: Pens in use (open) should not be stored in the refrigerator.
- d: This insulin differs from Humulin U-100 because it has both prandial and basal properties.
<table>
<thead>
<tr>
<th>Insulin Manufacturer</th>
<th>Onset (approximately)</th>
<th>Peak (approximately)</th>
<th>Duration (approximately)</th>
<th>Room Temperature Storage Range (59°–86° F)</th>
<th>Need to Roll Briskly 10+ Times?</th>
<th>Cartridge Sizes</th>
<th>Pens That Fit the Cartridges</th>
</tr>
</thead>
<tbody>
<tr>
<td>NovoLog® Vial</td>
<td>10–20 minutes</td>
<td>1–3 hours</td>
<td>3–5 hours</td>
<td>Up to 28 days</td>
<td>No</td>
<td>N/A</td>
<td>NovoPen Echo</td>
</tr>
<tr>
<td>NovoLog® PenFill®</td>
<td>10–20 minutes</td>
<td>1–3 hours</td>
<td>3–5 hours</td>
<td>Up to 28 days</td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>NovoLog® FlexPen</td>
<td>10–20 minutes</td>
<td>1–3 hours</td>
<td>3–5 hours</td>
<td>Up to 28 days</td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>Apidra®</td>
<td>15–30 minutes</td>
<td>60–90 minutes</td>
<td>&lt;5 hours</td>
<td>Up to 28 days</td>
<td>No</td>
<td>4 Unit, 8 Unit, 12 Unit</td>
<td>N/A</td>
</tr>
<tr>
<td>Apidra® SoloSTAR®</td>
<td>15–30 minutes</td>
<td>60–90 minutes</td>
<td>&lt;5 hours</td>
<td>Up to 28 days</td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>Apidra® Cartridge</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
<td>5 hours or less</td>
<td>Up to 28 days</td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>Afrezza®</td>
<td>Immediate</td>
<td>12–15 minutes</td>
<td>180 minutes</td>
<td>Up to 10 days</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Humalog® Vial</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
<td>5 hours or less</td>
<td>Up to 28 days</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Humalog® Cartridge</td>
<td>15–30 minutes</td>
<td>0.5–3.0 hours</td>
<td>5 hours or less</td>
<td>Up to 28 days</td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Humalog® KwikPen</td>
<td>15–30 minutes</td>
<td>0.5–3.0 hours</td>
<td>5 hours or less</td>
<td>Up to 28 days</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Humalog® KwikPen</td>
<td>15–30 minutes</td>
<td>0.5–3.0 hours</td>
<td>5 hours or less</td>
<td>Up to 28 days</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Note: NovoPen 3 and NovoPen Jr have been discontinued as of March, 2014.*
**Insulin**

<table>
<thead>
<tr>
<th>Insulin</th>
<th>Manufacturer</th>
<th>Onset (approximately)</th>
<th>Peak (approximately)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LONG ACTING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tresiba® (insulin degludec injection) FlexTouch U100 and U200, Novo Nordisk, 1 hour, virtually peakless</td>
<td>Novo Nordisk</td>
<td>1.6 hours</td>
<td>No pronounced peak &lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Levmir® Vial (insulin detemir [rDNA origin] injection)</td>
<td>Novo Nordisk</td>
<td>1.6 hours</td>
<td>No pronounced peak &lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Levmir® FlexTouch&lt;sup&gt;®&lt;/sup&gt;</td>
<td>Novo Nordisk</td>
<td>1.6 hours</td>
<td>No pronounced peak &lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Lantus&lt;sup&gt;®&lt;/sup&gt; (insulin glargine injection) 100 Units/mL</td>
<td>Sanofi</td>
<td>1.1 hours</td>
<td>5 hours</td>
</tr>
<tr>
<td>Lantus&lt;sup&gt;®&lt;/sup&gt; Cartridge</td>
<td>Sanofi</td>
<td>1.5 hours</td>
<td>None &lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Lantus&lt;sup&gt;®&lt;/sup&gt; SoloSTAR® (insulin glargine injection) 100 Units/mL</td>
<td>Sanofi</td>
<td>1.1 hours</td>
<td>5 hours</td>
</tr>
<tr>
<td>Toujeo® SoloSTAR® (insulin glargine injections) 300 Units/mL</td>
<td>Sanofi</td>
<td>6 hours</td>
<td>12 hours (at .4 units per kg)</td>
</tr>
<tr>
<td><strong>INTERMEDIATE/RAPID ACTING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NovoLog&lt;sup&gt;®&lt;/sup&gt; Mix 70/30 Vial&lt;sup&gt;®&lt;/sup&gt; (70% insulin aspart protamine suspension/30% aspart)</td>
<td>Novo Nordisk</td>
<td>10–20 minutes</td>
<td>2.4 hours</td>
</tr>
<tr>
<td>NovoLog&lt;sup&gt;®&lt;/sup&gt; Mix 70/30 FlexPen&lt;sup&gt;®&lt;/sup&gt;</td>
<td>Novo Nordisk</td>
<td>10–20 minutes</td>
<td>2.4 hours</td>
</tr>
<tr>
<td>Humalog&lt;sup&gt;®&lt;/sup&gt; Mix 50/50&lt;sup&gt;®&lt;/sup&gt; Vial (50% insulin lispro protamine suspension, 50% insulin lispro injection [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–3 hours</td>
</tr>
<tr>
<td>Humalog&lt;sup&gt;®&lt;/sup&gt; Mix 50/50&lt;sup&gt;®&lt;/sup&gt; KwikPen&lt;sup&gt;™&lt;/sup&gt; (50% insulin lispro protamine suspension, 50% insulin lispro injection [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–3 hours</td>
</tr>
<tr>
<td>Humalog&lt;sup&gt;®&lt;/sup&gt; Mix 75/25&lt;sup&gt;®&lt;/sup&gt; Vial (75% insulin lispro protamine suspension, 25% insulin lispro injection [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
</tr>
<tr>
<td>Humalog&lt;sup&gt;®&lt;/sup&gt; Mix 75/25&lt;sup&gt;®&lt;/sup&gt; KwikPen&lt;sup&gt;™&lt;/sup&gt; (prefilled) (75% insulin lispro protamine suspension, 25% insulin lispro injection [rDNA origin])</td>
<td>Lilly</td>
<td>15–30 minutes</td>
<td>0.5–2.5 hours</td>
</tr>
<tr>
<td><strong>INTERMEDIATE/SHORT ACTING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novolin® 70/30 Vial&lt;sup&gt;®&lt;/sup&gt; (70% NPH/30% Regular)</td>
<td>Novo Nordisk</td>
<td>30 minutes</td>
<td>2–12 hours</td>
</tr>
<tr>
<td>Humulin® 70/30 Vial (70% human insulin isophane suspension, 30% human insulin injection [rDNA origin])</td>
<td>Lilly</td>
<td>30–90 minutes</td>
<td>1.5–6.5 hours</td>
</tr>
<tr>
<td>Humulin® 70/30 KwikPen&lt;sup&gt;™&lt;/sup&gt; (prefilled) (70% human insulin isophane suspension, 30% human insulin injection [rDNA origin])</td>
<td>Lilly</td>
<td>30–90 minutes</td>
<td>1.5–6.5 hours</td>
</tr>
</tbody>
</table>

<sup>a</sup>: Also available in U-500 by prescription only.

<sup>b</sup>: Lantus and Levmir release at a relatively constant rate over a 24-hour period.

<sup>c</sup>: Pens in use (open) should not be stored in the refrigerator.

<sup>KwikPen must never be shared between patients, even if the needle is changed. Patients using Humalog Mix50/50 vials must never share needles or syringes with another person. Sharing poses a risk for transmission of blood-borne pathogens.</sup>
<table>
<thead>
<tr>
<th>Insulin Manufacturer</th>
<th>Onset (approximately)</th>
<th>Peak (approximately)</th>
<th>Room Temperature Storage Range (59°–86° F)</th>
<th>Need to Roll Briskly 10+ Times?</th>
<th>Cartridge Sizes</th>
<th>Pens That Fit the Cartridges</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LONG ACTING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tresiba® (insulin degludec injection)</td>
<td>FlexTouch U100 and U200, Novo Nordisk</td>
<td>1 hour</td>
<td>Virtually peakless</td>
<td>Yes</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beyond 42 hours</td>
<td>Up to 56 days</td>
<td></td>
<td></td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>Up to 24 hours</td>
<td>Up to 42 days</td>
<td></td>
<td></td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Up to 24 hours</td>
<td>Up to 42 days</td>
<td></td>
<td></td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>No</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 42 days</td>
<td></td>
<td></td>
<td>No</td>
<td>Pre-filled</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>No</td>
<td>Pre-filled</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>No</td>
<td>Pre-filled</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>Yes</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td>14-24 hours</td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>Yes</td>
<td>3 mL</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Up to 28 days</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Carefully shake/rotate</td>
<td>N/A</td>
</tr>
<tr>
<td>14-24 hours</td>
<td>Up to 10 days</td>
<td></td>
<td></td>
<td>Roll between hands and invert</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>14-24 hours</td>
<td>Up to 10 days</td>
<td></td>
<td></td>
<td>No</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>24 hours</td>
<td>Up to 42 days below 77° F</td>
<td></td>
<td></td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>18-24 hours</td>
<td>Up to 31 days</td>
<td></td>
<td></td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>18-24 hours</td>
<td>Up to 10 days</td>
<td></td>
<td></td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Printer-friendly charts are available at www.DiabetesHealth.com/charts*

Customer Support: Lilly, The Lilly Answers Center (800) 545-5979
Novo Nordisk (800) 727-6500
sanofi-aventis (800) 633-1610