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on Drugs and Therapeutics

SOME AVAILABLE INSULINS FOR TYPE 2 DIABETES

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SOME AVAILABLE INSULINS FOR TYPE 2 DIABETES

Product	Concentrations	Formulations	Onset	Peak	Duration	Comments
Basal Insulins						
Intermediate-Acting Insulin						
NPH –						- Twice-daily dosing is usually needed - Can be mixed with rapid-acting insulins, except <i>Fiasp</i> - Available OTC; <i>ReliOn</i> is only available at Walmart
<i>Humulin N</i> (Lilly)	100 units/mL	10 mL vials, 3 mL <i>KwikPen</i>	1-2 hrs	4-8 hrs	12-18 hrs	
<i>Novolin N</i> (Novo Nordisk)	100 units/mL	10 mL vials, 3 mL <i>FlexPen</i>				
<i>ReliOn/Novolin N</i>	100 units/mL	10 mL vials, 3 mL <i>FlexPen</i>				
Long-Acting Insulin Analogs						
Insulin glargine –						- Usually injected once daily; occasionally twice daily - Less likely than NPH to cause hypoglycemia - Cannot be mixed with other insulins <i>Semglee</i> and <i>Rezvoglar</i> are biosimilars considered interchangeable with <i>Lantus</i> <i>Basaglar</i> is a “follow-on” to <i>Lantus</i>; it is not interchangeable with <i>Lantus</i> - Daily dose of the <i>Toujeo</i> 300 units/mL formulation may need to be 10-15% higher than the daily dose of 100 units/mL formulations <i>Toujeo</i> may be less likely to cause hypoglycemia than the 100-units/mL products
<i>Lantus</i> (Sanofi)	100 units/mL	10 mL vials, 3 mL <i>SoloStar</i>	1-4 hrs	No peak	~24 hrs	
<i>Semglee</i> (Biocon)	100 units/mL	10 mL vials, 3 mL prefilled pens				
<i>Rezvoglar</i> (Lilly)	100 units/mL	3 mL <i>KwikPen</i>				
<i>Basaglar</i> (Lilly)	100 units/mL	3 mL <i>KwikPen</i>				
<i>Toujeo</i> (Sanofi)	300 units/mL	1.5 mL <i>SoloStar</i> , 3 mL <i>Max SoloStar</i>	1-6 hrs	No peak	24-36 hrs	
Insulin degludec –						- Injected once daily; does not need to be administered at the same time each day - Similar to insulin glargine 100 units/mL in A1C lowering, but may cause less hypoglycemia, especially nocturnal hypoglycemia 200 units/mL pen only allows for dosing of even number of units
<i>Tresiba</i> (Novo Nordisk)	100, 200 units/mL	10 mL vials, 3 mL <i>FlexTouch</i>	1-9 hrs	No peak	>42 hrs	

Product	Concentrations	Formulations	Onset	Peak	Duration	Comments
Prandial Insulins						
Regular Human Insulin						
Humulin R (Lilly)	100 units/mL	3, 10 mL vials	30-60 mins	1-5 hrs	4-12 hrs	- Should be injected about 30 minutes before a meal - Can be mixed with NPH insulin - May be slightly less effective than rapid-acting insulin analogs in lowering A1C, with more hypoglycemia - A U-500 insulin syringe is available for use with Humulin R 500 units/mL - Available OTC (100 units/mL formulations); ReliOn is only available at Walmart
	500 units/mL	20 mL vials, 3 mL KwikPen				
Novolin R (Novo Nordisk)	100 units/mL	10 mL vials, 3 mL FlexPen				
ReliOn Novolin R	100 units/mL	10 mL vials, 3 mL FlexPen				
Insulin inhalation powder –						
Afrezza (Mannkind)	4, 8, 12 units/inh	4, 8, 12 unit cartridges	12 mins	~35-55 mins	1.5-3 hrs	- Rapid-acting, dry powder formulation of recombinant regular human insulin - Administered via a breath-powered inhaler - Should be administered at the beginning of a meal - Dose can only be adjusted in 4-unit increments - Should not be used in patients who smoke or have lung cancer or chronic lung disease such as asthma or COPD; acute bronchospasm can occur - Pulmonary function should be assessed before starting treatment - Transient cough and throat pain are common
Rapid-Acting Insulin Analogs						
Insulin aspart – Novolog (Novo Nordisk)	100 units/mL	10 mL vials, 3 mL cartridges, 3 mL FlexPen	10-30 mins	1-2 hrs	3-5 hrs	- Novolog should be injected within 5-10 minutes before a meal - Novolog can be mixed with NPH insulin for SC injection - Merilog is a Novolog biosimilar; it is not interchangeable with Novolog - Kirsty is a biosimilar of Novolog considered interchangeable with Novolog - Fiasp should be injected at the start or within 20 minutes after starting a meal - Fiasp cannot be mixed with other insulins
Merilog (Sanofi)	100 units/mL	10 mL vials, 3 mL SoloStar pens				
Kirsty (Biocon)	100 units/mL	10 mL vials, 3 mL prefilled pens				
Fiasp (Novo Nordisk)	100 units/mL	10 mL vials, 3 mL FlexTouch	~2.5 mins	~63 mins	3-5 hrs	
Insulin glulisine – Apidra (Sanofi)	100 units/mL	10 mL vials, 3 mL SoloStar	10-30 mins	60 mins	4-5 hrs	- Should be injected within 15 minutes before a meal or within 20 minutes after starting a meal - Can be mixed with NPH insulin for SC injection
Insulin lispro – generic						
Humalog (Lilly)	100 units/mL	10 mL vials, 3 mL KwikPen	10-30 mins	0.5-2 hrs	3-5 hrs	- Should be injected within 15 minutes before a meal or immediately after a meal - Can be mixed with NPH insulin for SC injection - Admelog is a “follow-on” product similar to Humalog; they are not interchangeable - Lyumjev contains citrate to improve local vascular permeability and treprostinil to increase local vasodilation. It is not interchangeable with Humalog
	100, 200 units/mL	3 mL, 10 mL vials, 3 mL cartridges, 3 mL KwikPen				
Admelog (Sanofi)	100 units/mL	3, 10 mL vials, 3 mL SoloStar				
Lyumjev (Lilly)	100, 200 units/mL	10 mL vials, 3 mL KwikPen				

Product	Concentrations	Formulations	Onset	Peak	Duration	Comments
Premixed Insulins						
Humalog Mix 75/25 75% lispro protamine/25% lispro (Lilly)	100 units/mL	10 mL vials, 3 mL <i>KwikPen</i>	5-15 mins	2-4 hrs	14-24 hrs	- May simplify administration, but dose titration is more difficult - Hypoglycemia may be more frequent than with individual insulins - Not recommended for insulin-naive patients <i>Humulin 70/30</i> and <i>Novolin 70/30</i> are available OTC <i>ReliOn</i> is only available at Walmart
Humalog Mix 50/50 50% lispro protamine/50% lispro (Lilly)	100 units/mL	3 mL <i>KwikPen</i>	5-15 mins	2-4 hrs	14-24 hrs	
Novolog Mix 70/30 70% aspart protamine/30% aspart (Novo Nordisk)	100 units/mL	10 mL vials, 3 mL <i>FlexPen</i>	5-15 mins	2-4 hrs	14-24 hrs	
Humulin 70/30 70% NPH/30% regular (Lilly)	100 units/mL	3, 10 mL vials, 3 mL <i>KwikPen</i>	30-90 mins	1.5-6.5 hrs	18-24 hrs	
Novolin 70/30 ReliOn /Novolin 70/30 70% NPH/30% regular (Novo Nordisk)	100 units/mL	10 mL vials, 3 mL <i>FlexPen</i> 10 mL vials, 3 mL <i>FlexPen</i>	30-60 mins	2-12 hrs	12-24 hrs	