Comparison of Insulins (Canada)

(Modified July 2024)

This chart compares insulins in regard to duration, usual frequency, and cost. It also provides information on route of administration, stability of in-use products at room temperature, and place in therapy. See our toolbox, *Improving Diabetes Outcomes*, for more information on insulin and injectable diabetes meds.

--Information in this chart is from product monographs (**see footnote a**) unless otherwise specified.--

Insulin, Manufacturer	Duration	Usual Frequency	Formulations/Cost[b]	Stability, in-use, room temp
Rapid-acting: prandial human insulin analogues (rDNA origin). Onset 10 to 20 minutes (*Fiasp* faster.).[1] For **type 1 diabetes**, recommended at each meal as part of an intensive basal-prandial regimen.[1] For **type 2 diabetes**, as part of a "basal plus" strategy[c] or basal-bolus intensive regimen[d].[1] All are given via subcutaneous injection. *Humalog* 100 unit/mL can be given intramuscularly but is not recommended. See chart below for those available for intravenous or subcutaneous infusions (pump). All are clear and colourless.[1]				
Humalog (insulin lispro), Eli Lilly (*Liprelog*, an "authorized biosimilar" made by Eli Lilly, has been approved, but not yet marketed; no cost available)	3.5 to 4.75 hours	One to three times daily.[1] Inject within 15 min before a meal, or within 20 min after the start of the meal.	**100 units/mL**: $34/10 mL vial $67/5 of 3 mL cartridges $67/5 of 3 mL *KwikPen* $71/5 of 3mL *Junior KwikPen* **200 units/mL**: $125/5 of 3 mL *KwikPen*	Vial, cartridge, pen: 28 days Pump reservoir (100 mL/mL): 14 days IV infusion:[2] 48 hours (0.1 to 1 unit/mL in NS)
Admelog (insulin lispro), Sanofi-Aventis Biosimilar of *Humalog*[e]	2 to 5 hours	One to three times daily.[1] Inject within 15 min before a meal, or within 20 min after the start of the meal.	$25/10 mL vial $49/5 of 3 mL cartridges $49/5 of 3 mL *SoloSTAR* pens	Vial, cartridge, pen: 28 days Pump reservoir: 14 days
Kirsty (insulin aspart), BGP Pharma Biosimilar of *NovoRapid*[e]	3 to 5 hours	One to three times daily.[1] Inject 5 to 10 min before a meal, or immediately after the meal.	$46/5 of 3 mL pre-filled pens	Vial, pen: 28 days

Insulin, **Manufacturer**	**Duration**	**Usual Frequency**	**Formulations/Cost[b]**	**Stability, in-use, room temp**
Rapid-acting, continued				
Lyumjev (insulin lispro), Eli Lilly Approved, but not yet marketed	3 to 5 hours	One to three times daily.[1] Inject 0 to 2 min before a meal, or within 20 min after the start of the meal.	**100 units/mL**: 10 mL vial 5 of 3 mL cartridges 5 of 3 mL *KwikPen* 5 of 3 mL *Junior KwikPen* 5 of 3 mL *Tempo Pen* **200 units/mL**: 5 of 3 mL *Kwik Pen* Cost not available.	Vial, cartridge, pen: 28 days IV infusion: 20 hours (0.1 to 1 unit/mL in NS or D5W)
NovoRapid (insulin aspart), Novo Nordisk	3 to 5 hours	One to three times daily.[1] Inject within 5 to 10 min before a meal, or immediately after the meal.	$33/10 mL vial $67/5 of 3 mL *Penfill* cartridge $69/5 of 3 mL *FlexTouch* pens	Vial, cartridge, pen: 28 days Pump reservoir: 6 days.[3] IV infusion: 24 hours in D5W, D10W, or NS.[2]
Trurapi (insulin aspart), Sanofi-Aventis Biosimilar of *NovoRapid*[e]	3 to 5 hours	One to three times daily. Inject within 5 to 10 min before a meal, or immediately after the meal.	$49/5 of 3 mL cartridges $49/5 of 3 mL *SoloSTAR* pens	Cartridge, pen: 28 days Pump reservoir: 6 days[3] IV infusion: 24 hours (details in labeling)
Apidra (insulin glulisine), Sanofi-Aventis	4 hours	One to three times daily.[1] Inject within 15 min before a meal, or within 20 min after the start of the meal.	$29/10 mL vial $57/5 of 3 mL cartridges $57/5 of 3 mL *SoloStar* pens	Vial, cartridge, pen: 28 days Pump reservoir: 48 hours
Fiasp (insulin aspart), Novo Nordisk Formulated with niacinamide for faster absorption.	3 to 5 hours	One to three times daily.[1] Inject within 2 min before a meal, or within 20 min after the start of the meal.	$32/10 mL vial $66/5 of 3 mL *Penfill* cartridge $68/5 of 3 mL *FlexTouch* pens	Vial, cartridge, pen: 28 days Pump reservoir: 6 days IV infusion: 24 hours (0.5 to 1 unit/mL in NS or D5W)

Insulin, Manufacturer	Duration	Usual Frequency	Formulations/Cost[b]	Stability, in-use, room temp
Short-acting (regular): regular human insulin of rDNA origin (*Humulin R*, *Novolin ge Toronto*, *Entuzity*), or pork insulin (*Hypurin Regular*). Onset about 15 minutes *Entuzity*, 30 minutes (*Humulin R* and *Novolin ge Toronto*), or up to 60 minutes for pork insulin. Longer time to onset and longer duration than rapid-acting analogues. For type 1 diabetes, recommended at each meal as part of an intensive basal-prandial regimen.[1] For type 2 diabetes, as part of a "basal plus" strategy[c] or basal-bolus intensive regimen[d].[1] Can be given via subcutaneous or intramuscular injection, or intravenous infusion. All are clear and colourless.[1]				
Humulin R **100 units/mL**, Eli Lilly	6 to 8 hours	One to three times daily.[1] Inject 30 to 45 min before meal.[1]	$28/10 mL vial $55/5 x 3 mL cartridges	Vial, cartridge: 28 days IV infusion:[2] 48 hours (0.1 to 1 unit/mL in NS)
Entuzity **500 units/mL**, Eli Lilly	17 to 24 hours	Two to three times daily. Inject 30 minutes before meal.	$106/2 of 3 mL *KwikPen*	Pen: 28 days
Myxredlin Baxter Biosimilar of *Novolin ge Toronto*[e] Approved but not yet marketed	See *Novolin ge Toronto*	0.3 to 1 unit/kg/day via IV infusion. (For emergencies [e.g., diabetic coma and pre-coma], patients with diabetes undergoing surgery.)	IV infusion 1 unit/mL in 100 mL NS Cost not available.	IV infusion: 25 days
Novolin ge Toronto, Novo Nordisk	8 hours	One to three times daily.[1] Inject 30 minutes before meal.	$26/10 mL vial $51/5 of 3 mL *Penfill* cartridges	Vial, cartridge: 28 days IV infusion: 24 hours (details in labeling)
Hypurin Regular, Wockhardt UK	6 to 8 hours	One to three times daily.[1] Inject 30 to 45 min before meal.[1]	$107/10 mL vial	Vial: 28 days
Intermediate-acting (NPH): human insulin (rDNA origin) isophane suspension (*Humulin N*, *Novolin ge NPH*), or pork insulin isophane suspension (*Hypurin NPH*). For **type 1 diabetes**, may be used as the basal component of basal-prandial regimens.[1] An initial insulin option in **type 2 diabetes**, often as a once-daily add-on to oral agents.[1] As type-2 diabetes progresses, may be used as part of a "basal plus" strategy[c] or basal-bolus intensive regimen[d].[1] Onset one to three hours.[1] Administered via subcutaneous injection. *Hypurin NPH* can also be given IM (faster onset and shorter duration). All appear cloudy.[1]				
Novolin ge NPH, Novo Nordisk	About 24 hours	Once or twice daily.	$26/10 ml vial $52/5 of 3 mL *Penfill* cartridges	Vial, cartridge: 28 days
Humulin N, Eli Lilly	up to 24 hours	Once or twice daily.[1]	$28/10 mL vial $55/5 of 3 mL cartridges $55/5 of 3 mL *KwikPen*	Vial, cartridge, pen: 28 days
Hypurin NPH, Wockhardt UK	18 to 24 hours	Once or twice daily.[1]	$107/10 mL vial	Vial: 28 days

Insulin, Manufacturer	Duration	Usual Frequency	Formulations/Cost[b]	Stability, in-use, room temp
Long-acting: human insulin analogue (rDNA origin). For **type 1 diabetes**, may be used as the basal component of basal-prandial regimens.[1] An initial insulin option in **type 2 diabetes**, often as a once-daily add-on to oral agents.[1] As type-2 diabetes progresses, may be used as part of a "basal plus" strategy[c] or basal-bolus intensive regimen[d].[1] Administered via subcutaneous injection. All are clear and colourless.[1]				
Basaglar (insulin glargine), Eli Lilly Biosimilar of *Lantus*[e]	See *Lantus*.	Once daily at the same time each day.	$78/ 5 of 3 mL cartridges $78/ 5 of 3 mL *KwikPen*	Cartridge, pen: 28 days
Lantus (insulin glargine), Sanofi-Aventis	Median 24 hours (range 10.8 to >24 hours; sampling period 24 hours)	Once daily at the same time each day.	$67/10 mL vial $100/5 of 3 mL cartridges $100/5 of 3 mL *SoloStar* pens	Vial, cartridge, pen: 28 days
Levemir (insulin detemir), Novo Nordisk	6 to 24 hours (dose-dependent; binds to albumin)	Once daily, or twice daily as part of a basal-bolus regimen, with the evening dose administered with the evening meal or at bedtime.	$117/5 of *Penfill* cartridges $120/5 of 3 mL *FlexTouch* pens	Cartridge, pen: 42 days
Semglee (insulin glargine) BGP Pharma Biosimilar to *Lantus*[e]	See *Lantus*	Once daily at the same time each day.	$69/5 of 3 mL pens	Pen: 28 days
Toujeo (insulin glargine), Sanofi-Aventis (300 units/mL)	Up to 36 hours	Once daily at the same time each day. First injection may provide insufficient coverage; may take at least 5 days to see maximum effect.	$86/3 of 1.5 mL *SoloStar* pens $143/5 of 1.5 mL *SoloStar* pens $171/3 of 3 mL *DoubleStar* pen	Pen: 42 days

Insulin, Manufacturer	Duration	Usual Frequency	Formulations/Cost[b]	Stability, in-use, room temp
Ultra-Long-acting: human insulin analogue (rDNA origin). Administered via subcutaneous injection. May be beneficial for patients with adherence issues. All are clear and colourless.[1] • Consider **insulin degludec** for patients with severe or nocturnal hypoglycemia on another basal analogue, or with hypoglycemia risk factors.[4] • Consider avoiding **insulin icodec** in patients most at risk of hypoglycemia (e.g., impaired hypoglycemia awareness, history of severe and recurrent hypoglycemia) due to lack of data in these patients.				
Awiqli (insulin icodec) Novo Nordisk (700 units/mL)	At least 1 week[9]	Once weekly	$85 /1.5 mL *FlexTouch* pen $170 /3 mL *FlexTouch* pen	Pen: 12 weeks
Tresiba (insulin degludec), Novo Nordisk	42 hours	Once daily at the same time each day.	**100 units/mL**: $120/5 of 3 mL *FlexTouch* pens **200 unit/mL**: $144/5 of 3 mL *FlexTouch* pens	Pen: 56 days
Insulin Mixes: human insulin analogue (rDNA origin) solution and protamine-crystallized human insulin analogue suspension (*NovoMix 30*, *Humalog Mix 25*, *Humalog Mix 50*). Others are human insulin (rDNA origin) solution and human insulin isophane suspension. Generally, not appropriate for type 1 diabetes due to lack of dose flexibiltiy.[1] Consider for elderly patients with type 2 diabetes due to ease of use.[1] Typically added to oral agents.[1] Given once or twice daily with breakfast and/or supper.[1] Administered via subcutaneous injection. All appear cloudy.[1]				
NovoMix 30 (30% insulin aspart solution, 70% insulin aspart protamine suspension), Novo Nordisk	Up to 24 hours	Typically given pre-breakfast and/or pre-supper,[1] immediately (not more than 5 to 10 min) before the meal, or immediately after the meal.	$61/5 of 3 mL *Penfill* cartridges	Cartridge: 28 days
Humalog Mix 25 (25% insulin lispro solution/75% insulin lispro protamine suspension), Eli Lilly	Up to 22 hours	Typically given pre-breakfast and/or pre-supper,[1] within 15 min before the meal.	$68/5 of 3 mL cartridges $68/5 of 3 mL *KwikPen*	Cartridge, pen: 28 days
Humalog Mix 50 (50% insulin lispro solution, 50% insulin lispro protamine suspension), Eli Lilly	Up to 22 hours	Typically given pre-breakfast and/or pre-supper,[1] within 15 min before the meal.	$67/5 of 3 mL cartridges $67/5 of 3 mL *KwikPen*	Cartridge, pen: 28 days

Insulin, Manufacturer	Duration	Usual Frequency	Formulations/Cost[b]	Stability, in-use, room temp
Insulin Mixes, continued				
Humulin 30/70 (30% regular, 70% NPH), Eli Lilly	Mean: 23 hours (range: 18 to 24 hours)[7]	Typically given pre-breakfast and/or pre-supper, about 30 to 45 min before the meal.[1]	$28/10 mL vial $55/5 x 3 mL cartridges	Vial, cartridge: 28 days
Novolin ge 30/70 (30% regular, 70% NPH), Novo Nordisk	About 24 hours	Typically given pre-breakfast and/or pre-supper,[1] within 30 minutes before meal.	$26/10 mL vial $50/5 of 3 mL *Penfill* cartridges	Vial, cartridge: 28 days
Novolin ge 40/60 (40% regular, 60% NPH), Novo Nordisk	About 24 hours	Typically given pre-breakfast and/or pre-supper,[1]within 30 minutes before the meal.	$50/5 of 3 mL *Penfill* cartridges	Cartridge: 28 days
Novolin ge 50/50 (50% regular, 50% NPH), Novo Nordisk	About 24 hours	Typically given pre-breakfast and/or pre-supper,[1] within 30 minutes before the meal.	$50/5 of 3 mL *Penfill* cartridges	Cartridge: 28 days

a. **Product monographs used in creation of this chart**: *Humalog* (April 2021), *Kirsty* (October 2021), *Lyumjev* (September 2021), *NovoRapid* (August 2021), *Apidra* (December 2021), *Fiasp* (July 2021), *Trurapi* (July 2022), *Admelog* (December 2021), *Humulin* (March 2021), *Entuzity* (March 2021), *Myxredlin* (August 2022), *Novolin ge* (August 2021), *Hypurin Regular* (June 2017), *Hypurin NPH* (June 2017), *Basaglar* (March 2021), *Lantus* (December 2021), *Levemir* (August 2021), *Semglee* (September 2022), *Toujeo* (October 2019), *Awiqli* (March 2024), *Tresiba* (July 2021), *NovoMix 30* (August 2021).
b. Wholesale acquisition cost (WAC).
c. "Basal plus" strategy: rapid- or short-acting insulin once daily at main meal or breakfast plus basal insulin.[1]
d. Basal-bolus intensive regimen: rapid- or short-acting insulin three times daily with meals plus basal insuilin.[1]
e. Biosimilar products are not automatically interchangeable with the reference biologic drug. Each province/territory determines interchangeability.[8]

Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.

References

1. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes. 2018 Apr;42 Suppl 1:S1-S325.
2. Clinical Pharmacology powered by ClinicalKey. Tampa (FL): Elsevier. 2022. http://www.clinicalkey.com. (Accessed August 16, 2022).
3. Senesh G, Bushi D, Neta A, Yodfat O. Compatibility of insulin Lispro, Aspart, and Glulisine with the Solo MicroPump, a novel miniature insulin pump. J Diabetes Sci Technol. 2010 Jan 1;4(1):104-10.
4. Marso SP, McGuire DK, Zinman B, et al. Efficacy and Safety of Degludec versus Glargine in Type 2 Diabetes. N Engl J Med. 2017 Aug 24;377(8):723-732.
5. Lane W, Bailey TS, Gerety G, et al. Effect of Insulin Degludec vs Insulin Glargine U100 on Hypoglycemia in Patients With Type 1 Diabetes: The SWITCH 1 Randomized Clinical Trial. JAMA. 2017 Jul 4;318(1):33-44.
6. Wysham C, Bhargava A, Chaykin L, et al. Effect of Insulin Degludec vs Insulin Glargine U100 on Hypoglycemia in Patients With Type 2 Diabetes: The SWITCH 2 Randomized Clinical Trial. JAMA. 2017 Jul 4;318(1):45-56.
7. Product information for Humulin 70/30. Eli Lilly and Company. Indianapolis, IN 46285. June 2022.
8. Health Canada. Biosimilar biologic drugs in Canada: fact sheet. August 27, 2019. https://www.canada.ca/en/health-canada/services/drugs-health-products/biologics-radiopharmaceuticals-genetic-therapies/applications-submissions/guidance-documents/fact-sheet-biosimilars.html. (Accessed August 15, 2022).
9. Pieber TR, Asong M, Fluhr G, et al. Pharmacokinetic and pharmacodynamic properties of once-weekly insulin icodec in individuals with type 2 diabetes. Diabetes Obes Metab. 2023 Dec;25(12):3716-3723.

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