

## Comparison of GLP-1 and GIP/GLP-1 Receptor Agonists

modified July 2025

This chart compares GLP-1 and GIP/GLP-1 receptor agonists (e.g., tirzepatide) in regard to A1c reduction, weight loss, dosing, tolerability, clinical outcomes (e.g., cardiac or kidney benefit), how supplied, cost, and storage. For a review of class **adverse effects**, see **footnote f**.

<b>Drug/ A1c decrease/ Weight loss</b>	<b>Availability Cost<sup>b</sup> Storage<sup>c</sup></b>	<b>Dosing (subcutaneous injection in ADULTS unless otherwise specified)<sup>c</sup></b>	<b>Comments (e.g., clinical outcomes, tolerability)</b>
Dulaglutide (Trulicity)  Indicated for diabetes (ages ≥10 years), CV risk reduction  A1c: -0.84% to -1.34% <sup>1,a</sup>  Weight loss: 0.5% to 2.6% <sup>a,c</sup>	Single dose pen (autoinjector): 0.75, 1.5, 3 (US), 4.5 mg (US)  US: ~\$2,000 Canada: ~\$250 (1.5 mg/week)  Store at 2°C to 8°C, or room temp (≤30°C) for ≤14 days.	<b>Initial:</b> 0.75 mg once weekly. <b>Max:</b> may increase to 1.5 mg once weekly, then by 1.5 mg weekly every four weeks to a max of 4.5 mg once weekly. Max dose is 1.5 mg weekly in <b>children</b> 10 to 17 years.  <b>Comparative dose:</b> see footnote g.  <b>Missed dose:</b> If <72 hours remain until the next scheduled dose, skip the missed dose. If ≥72 hours remain, administer the missed dose. <sup>c</sup> If ≥3 doses are missed, consider restarting with ≤1.5 mg. <sup>15</sup>	<ul style="list-style-type: none"> <li>• MACE and kidney benefit.<sup>4,5</sup> See our Infographic, <i>Diabetes Medications: Cardiovascular and Kidney Impact</i>, for details.</li> <li>• Discontinuation due to adverse GI effects (1.5 mg): ~1 in 15 patients<sup>3</sup></li> </ul>
Exenatide (Byetta [US])  Indicated for diabetes.  A1c: -0.7% (10 mcg BID monotherapy) <sup>a,c</sup>  <i>Continued...</i>	Sixty (60)-dose pen: 5, 10 mcg (needles not included)  US: ~\$850  Store at 2°C to 8°C. In- use pens can be stored at ≤25°C for up to 30 days.	<b>Initial:</b> 5 mcg BID within 60 min before the two main meals (≥6 hours apart). <b>Max:</b> may increase to 10 mcg BID after four weeks.  <b>Comparative dose:</b> see footnote g.  <b>Missed dose:</b> skip missed dose  <b>Kidney impairment:</b> Not recommended if CrCl <30 mL/min. Use 10 mcg BID with	<ul style="list-style-type: none"> <li>• Discontinuation due to adverse GI effects (10 mcg BID): ~1 in 24 patients<sup>3</sup></li> </ul>

Drug/ A1c decrease/ Weight loss	Availability Cost <sup>b</sup> Storage <sup>c</sup>	Dosing (subcutaneous injection in ADULTS unless otherwise specified) <sup>c</sup>	Comments (e.g., clinical outcomes, tolerability)
Byetta, continued  Weight loss: - 0.3% to 2.8% <sup>a,c</sup>		caution if CrCl 30 to 50 mL/min. Use caution in kidney transplant.	
Liraglutide (Saxenda)  Indicated for weight loss.  Weight loss: 2.7% to 4% <sup>23,a</sup>	Dial-a-dose pen: 18 mg/3 mL (pen needles not included)  US: ~\$1,300 Canada: ~\$450  Store at 2°C to 8°C. In- use pens can be stored at room temp (≤30°C) for ≤30 days.	For patients 12 years and older: 3 mg <b>once daily</b> (start with 0.6 mg once daily, increase dose weekly by 0.6 mg to goal of 3 mg once daily). For adults, discontinue after 16 weeks if <4% (after 12 weeks if ≤5% [Canada]) weight loss achieved.  <b>Comparative dose:</b> see footnote g.  <b>Missed dose:</b> Skip the missed dose. If more than three days have elapsed since the last dose, retitrate starting with 0.6 mg once daily (US).	<ul style="list-style-type: none"> <li>• See <i>Victoza</i>, below for information on clinical outcomes in type 2 DM.</li> <li>• ~44% to 62% of patients met weight loss goal at 56 weeks compared to 16% to 34% with placebo.</li> <li>• Discontinuation due to adverse effects: ~1 in 11 patients.<sup>c</sup></li> <li>•</li> </ul>
Liraglutide <sup>d</sup> (Victoza, generics)  Indicated for diabetes, CV risk reduction.  <i>Continued...</i>	Dial-a-dose pen: 18 mg/3 mL (pen needles not included)  US: ~\$710 Canada: ~\$340	For patients 10 years and older: <b>Initial:</b> 0.6 mg once daily for one week, then 1.2 mg once daily. (Pediatric patients may achieve control with 0.6 mg once daily.) <b>Max:</b> may increase to 1.8 mg once daily after one week.  <b>Comparative dose:</b> see footnote g.	<ul style="list-style-type: none"> <li>• MACE and kidney benefit.<sup>7</sup> See our Infographic, <i>Diabetes Medications: Cardiovascular and Kidney Impact</i>, for details.</li> <li>• Discontinuation due to adverse GI effects (1.8 mg): ~1 in 8 patients<sup>3</sup></li> </ul>

Drug/ A1c decrease/ Weight loss	Availability Cost <sup>b</sup> Storage <sup>c</sup>	Dosing (subcutaneous injection in ADULTS unless otherwise specified) <sup>c</sup>	Comments (e.g., clinical outcomes, tolerability)
<p>Victoza, continued</p> <p>A1c: -0.79% to 1.3% (adults);<sup>1,a</sup> -1.06% (pediatrics)<sup>1,a,c</sup></p> <p>Weight loss: 2.7%<sup>23,a</sup></p>	<p>Store at 2°C to 8°C. In-use pens can be stored at room temp (<math>\leq 30^{\circ}\text{C}</math>) for <math>\leq 30</math> days.</p>	<p><b>Missed dose:</b> Skip the missed dose. If more than three days have elapsed since the last dose, retitrate starting with 0.6 mg once daily (US).</p>	
<p>Semaglutide (Ozempic)</p> <p>Indicated for diabetes (US: CV and CKD risk reduction).</p> <p>A1c: -1.12% to -1.67%<sup>1,a</sup></p> <p>Weight loss : 3.6% to 6.2%<sup>23,a</sup></p>	<p>Multi-dose pen: 0.25 or 0.5 mg (four 0.25 mg doses or two 0.5 mg doses), 1 mg (4 doses), 2 mg (4 doses [US]) (includes needles)</p> <p>US: ~\$1,000 Canada: ~\$240 (1 mg/week)</p> <p>Store at 2°C to 8°C. In-use pens can be stored at room temp (<math>\leq 30^{\circ}\text{C}</math>) for <math>\leq 56</math> days.</p>	<p><b>Initial:</b> 0.25 mg once weekly for four weeks, then 0.5 mg once weekly, <b>Max:</b> may increase to 1 mg once weekly after four weeks. After four weeks on the 1 mg dose, may increase to 2 mg once weekly. Target dose to reduce the risk of eGFR decline, ESKD, and CV death: 1 mg once weekly.</p> <p><b>Comparative dose:</b> see footnote g.</p> <p><b>Missed dose:</b> if &lt;48 hours remain until the next scheduled dose, skip the missed dose. If &gt;48 remain, administer the missed dose. If two or more consecutive doses are missed, consider starting with 0.25 mg once weekly.<sup>c</sup> Some experts would restart with 1 mg if one or two doses are missed, 0.5 mg if three or four doses are missed, or 0.25 mg if <math>\geq 5</math> doses are missed.<sup>15</sup></p>	<ul style="list-style-type: none"> <li>• MACE, PAD, and kidney benefit, including CKD.<sup>6,8,24</sup> See our Infographic, <i>Diabetes Medications: Cardiovascular and Kidney Impact</i>, for details.</li> <li>• Discontinuation due to adverse GI effects (1 mg): ~1 in 10 patients<sup>3</sup></li> </ul>

Drug/ A1c decrease/ Weight loss	Availability Cost <sup>b</sup> Storage <sup>c</sup>	Dosing (subcutaneous injection in ADULTS unless otherwise specified) <sup>c</sup>	Comments (e.g., clinical outcomes, tolerability)
<p>Semaglutide (Rybelsus)</p> <p>Indicated for diabetes.</p> <p>A1c: -0.8% to -1.2%<sup>a,c</sup></p> <p>Weight loss 1% to 4.1%<sup>a,c</sup></p>	<p>Formulation R1:* 3, 7, 14 mg tablets.</p> <p>Formulation R2:* 1.5, 4, 9 mg tablets.</p> <p>*Not interchangeable mg-per-mg. (In Canada: R1 formulation is called initial formulation, and R2 formulation is called optimized formulation)</p> <p>US: ~\$1,000 (R1)(7 mg) Canada: ~\$230 (R1)</p>	<p><b>Initial:</b> 3 mg (R1) or 1.5 mg (R2) once daily at least 30 minutes before the first food, beverage, or other oral medications of the day, with ≤120 mL of water (~half a glass). After 30 days, increase the dose to 7 mg (R1) or 4 mg (R2) once daily.</p> <p><b>Max:</b> After 30 days on the 7 mg (R1) or 4 mg (R2) dose, may increase to 14 mg (R1) or 9 mg (R2) once daily.</p> <p><b>Comparative dose (US: after the initiation phase):</b> 7 mg (R1) = 4 mg (R2), and 14 mg (R1) = 9mg (R2). US: patients on <i>Ozempic</i> 0.5 mg once weekly can be switched to 7 mg (R1) or 14 mg (R1). Also see footnote g.</p> <p><b>Missed dose:</b> skip the missed dose</p>	<ul style="list-style-type: none"> <li>MACE benefit.<sup>9</sup> See our Infographic, <i>Diabetes Medications: Cardiovascular and Kidney Impact</i>, for details.</li> <li>Discontinuation due to adverse GI effects: ~1 in 15 patients<sup>c</sup></li> <li>Dispense in original container.</li> </ul>
<p>Semaglutide (Wegovy)</p> <p>Indicated for weight loss and CV risk reduction.</p> <p><i>Continued...</i></p>	<p>Single-dose pen (autoinjector): 0.25, 0.5, 1, 1.7, 2.4 mg.</p> <p>US: ~\$1,350 Canada: ~\$420</p>	<p>For patients 12 years and older: 0.25 mg once weekly, increased every four weeks to 0.5 mg, 1 mg, 1.7 mg, then 2.4 mg once weekly.</p> <p>Canada: consider stopping if the patient is not showing progress after 12 weeks on the maintenance dose.</p> <p><b>Comparative dose:</b> see footnote g.</p> <p><b>Missed dose:</b> if &lt;48 hours remain until the next scheduled dose, skip the missed dose. If &gt;48 hours remain, administer the missed dose. If two or more consecutive doses are missed, consider restarting with 0.25 mg once weekly.<sup>c</sup> Some experts would restart with 1</p>	<ul style="list-style-type: none"> <li>MACE and PAD benefit.<sup>6,10</sup> See our Infographic, <i>Diabetes Medications: Cardiovascular and Kidney Impact</i>, for details.</li> <li>67% to 85% of patients met weight loss goal (≥5%) at 52 weeks compared to 30% to 48% with placebo.<sup>13,14</sup></li> <li>Discontinuation due to adverse effects: ~ 1 in 15 patients<sup>c</sup></li> <li>In a head-to-head, open-label study in patients without diabetes, weight loss from baseline was ~14% vs ~20% with tirzepatide (<i>Zepbound</i>).<sup>25</sup></li> <li>In a head-to-head, open-label study in patients without diabetes, weight loss from baseline was ~16% vs ~6% with liraglutide 3 mg (<i>Saxenda</i>).<sup>26</sup></li> </ul>

Drug/ A1c decrease/ Weight loss	Availability Cost <sup>b</sup> Storage <sup>c</sup>	Dosing (subcutaneous injection in ADULTS unless otherwise specified) <sup>c</sup>	Comments (e.g., clinical outcomes, tolerability)
Wegovy, continued  Weight loss: 10.3% to 14.4% (patients without diabetes) <sup>13,14</sup>	Store at 2°C to 8°C. Can be stored at room temp (≤30°C) for ≤28 days.	mg if one or two doses are missed, 0.5 mg if three or four doses are missed, and 0.25 mg if ≥5doses are missed. <sup>15</sup>	
Tirzepatide <sup>c</sup> (Mounjaro)  Indicated for diabetes.  A1c: -1.74% to -2.47% <sup>1,a</sup>  Weight loss: ~7% to 11%. (in patients using insulin) <sup>22,a</sup>	Single-dose vial or pen (autoinjector [US]): 2.5, 5, 7.5, 10, 12.5 (US), 15 mg (US) (vial does not include needles or syringe)  US: ~\$1,100 Canada: ~\$100 (10 mg vial)  Store at 2°C to 8°C. Can be stored at room temp (≤30°C) for ≤21 days.	<b>Initial:</b> 2.5 mg once weekly for four weeks, then 5 mg once weekly. <b>Max:</b> may increase by 2.5 mg/week every four weeks to a max of 15 mg once weekly.  <b>Comparative dose:</b> see footnote g.  <b>Missed dose:</b> If <72 hours remain until the next scheduled dose, skip the missed dose. If ≥72 hours remain, administer the missed dose. <sup>c</sup> If ≥3 doses are missed, consider restarting with ≤5 mg once weekly. <sup>15</sup>	<ul style="list-style-type: none"> <li>• May delay oral contraceptive absorption. Advise switching to a non-oral contraceptive or adding a barrier contraceptive for four weeks after initiation or a dosage increase.<sup>c</sup></li> <li>• Discontinuation due to adverse GI effects (15 mg): ~1 in 16 patients.<sup>c</sup></li> </ul>

Drug/ A1c decrease/ Weight loss	Availability Cost <sup>b</sup> Storage <sup>c</sup>	Dosing (subcutaneous injection in ADULTS unless otherwise specified) <sup>c</sup>	Comments (e.g., clinical outcomes, tolerability)
<p>Tirzepatide<sup>c</sup> (Zepbound)</p> <p>Indicated for weight loss, (and for sleep apnea [AHI <math>\geq 15</math>] in obese patients [US]).</p> <p>Weight loss: ~14% to 20% (patients did not have diabetes)<sup>12,a</sup></p>	<p>Single-dose vial (US) or pen: 2.5, 5, 7.5, 10, 12.5, 15 mg (vials do not include syringe or needle)</p> <p>US: ~\$1,100 Canada: ~\$570 (10 mg)</p> <p>Store at 2°C to 8°C. Can be stored at room temp (<math>\leq 30^\circ\text{C}</math>) for <math>\leq 21</math> days.</p>	<p>Start with 2.5 mg once weekly, increase dose by 2.5 mg every 4 weeks to target dose of 5 mg, 10 mg, or 15 mg. Target dose for sleep apnea is 10 or 15 mg.</p> <p><b>Comparative dose:</b> see footnote g.</p> <p><b>Missed dose:</b> If <math>&lt; 72</math> hours remain until the next scheduled dose, skip the missed dose. If <math>\geq 72</math> hours remain, administer the missed dose.<sup>c</sup> If <math>\geq 3</math> doses are missed, consider restarting with <math>\leq 5</math> mg once weekly.<sup>15</sup></p>	<ul style="list-style-type: none"> <li>Benefit in patients with HFpEF and obesity.<sup>31</sup> See our Infographic, <i>Diabetes Medications: Cardiovascular and Kidney Impact</i>, for details.</li> <li>May delay oral contraceptive absorption. Advise switching to a non-oral contraceptive or adding a barrier contraceptive for four weeks after initiation or a dosage increase.<sup>c</sup></li> <li>Discontinuation due to adverse effects: ~ 1 in 15 patients<sup>c</sup></li> <li>Though no specific guidance is available, stopping after 12 weeks if <math>&lt; 5\%</math> weight loss achieved is reasonable based on guidelines.<sup>11</sup></li> <li>85% to 91% of patients met weight loss goal (<math>\geq 5\%</math>) at 72 weeks compared to 35% with placebo.<sup>12</sup></li> <li>In a head-to-head, open-label study in patients without diabetes, weight loss from baseline was ~20% vs ~14% with semaglutide (<i>Wegovy</i>).<sup>25</sup></li> </ul>

**Abbreviations:** AHI = apnea-hypopnea index; BID = twice daily; CKD = chronic kidney disease; CV = cardiovascular; DM: diabetes mellitus; eGFR = estimated glomerular filtration rate; ESKD = end-stage kidney disease; GI = gastrointestinal; GIP = glucose-dependent insulinotropic polypeptide; GLP-1 = glucagon-like peptide-1; HF = heart failure; HFpEF = heart failure with preserved ejection fraction; MACE = major adverse cardiovascular events; MI = myocardial infarction; NNT = number needed to treat; PAD = peripheral artery disease; SCr = serum creatinine

- Diabetes indication:** A1c and weight reduction compared to placebo, as an add-on to other diabetes medication (unless monotherapy is specified). **Weight loss indication:** weight loss with lifestyle changes and/or diet. **Weight loss is the amount above that seen with placebo.** Weight loss varies based on lifestyle modification, dose achieved, concomitant medications, etc.
- Wholesale acquisition cost (US) per month of maximum dose (or dose specified) of generic, if available. US medication pricing by Elsevier, accessed January 2025. Canadian cost is wholesale (August 2024 [Zepbound, liraglutide July 2025]). Prices for products that are dosed weekly represent a 28-day supply. Prices for products that are dosed daily represent a 30-day supply.
- US product information used in creation of this chart:** Trulicity (November 2024), Byetta (November 2024), Saxenda (November 2024), Victoza (November 2024), Ozempic (January 2025), Rybelsus (December 2024), Wegovy (November 2024), Mounjaro (December 2024), Zepbound (April 2025). **Canadian product monographs used in creation of this chart:** Trulicity (July 2024), Saxenda (April 2024), Victoza

(December 2024), Ozempic (March 2024), Rybelsus (October 2024), Wegovy (November 2024), Mounjaro (September 2024), Zepbound (May 2025)

- d. **Liraglutide** is available in combination with insulin degludec (Xultophy).
- e. **Tirzepatide** is a GLP-1 agonist and glucose-dependent insulinotropic polypeptide (GIP) agonist.
- f. **Adverse effects:**<sup>c</sup> (Note that in the US, these medications must be dispensed with a **Medication Guide**.)
  - GI side effects are common during dose escalation (e.g., nausea, vomiting, diarrhea). Resulting volume depletion may lead to acute kidney injury. GLP-1 agonists have been associated with bowel obstruction.<sup>17</sup> Educate patients about the potential for ileus.<sup>20</sup>
    - These GI side effects, and delayed gastric emptying, entail special considerations in surgical patients. See our chart, *Perioperative Management of Diabetes*.
  - These drugs carry warnings about gallbladder disease (low risk) and pancreatitis (association unclear).<sup>3,19,21,c</sup> Stop if pancreatitis is suspected, and do not restart if pancreatitis is confirmed. There have been reports of pancreatic cancer in patients using GLP-1 agonists, but current evidence does not support causality.<sup>19</sup>
  - These drugs are contraindicated in patients with a personal or family history of medullary thyroid cancer or patients with multiple endocrine neoplasia type 2. They cause thyroid C-cell tumors in mice.
  - Rapid improvement in glycemic control is associated with diabetic retinopathy complications.
  - Risk of hypoglycemia is low as monotherapy.
  - Monitor for depression and suicidal ideation in patients taking these drugs for weight loss. Discontinue if symptoms develop.
  - Don't combine with other GLP-1 agonists. Generally, avoid use in patients taking a dipeptidylpeptidase-4 inhibitor (e.g., saxagliptin), as combining these two classes of medications is unlikely to improve weight loss or glycemic control and is not cost-effective.<sup>18</sup>
- g. **Comparative dosing based on glycemic efficacy.**<sup>15</sup> Consider a lower starting dose if GI tolerability is a priority.<sup>16</sup>
  - exenatide 5 mcg BID ~liraglutide 0.6 mg/day ~semaglutide 3 mg (R1) orally once daily
  - dulaglutide 0.75 mg/week ~ exenatide 10 mcg BID ~ liraglutide 1.2 mg/day ~ semaglutide 0.25 mg/week ~ semaglutide 7 mg orally once daily
  - dulaglutide 1.5 mg/week ~ exenatide 2 mg/week ~ liraglutide 1.8 mg/day ~ semaglutide 0.5 mg/week ~ semaglutide 14 mg orally once daily ~ tirzepatide 2.5 mg/week
  - dulaglutide 4.5 mg/week ~ semaglutide 1 mg/week
  - semaglutide 2 mg/week ~ tirzepatide 5 mg/week

**Comparative dosing based on weight loss**<sup>25-30</sup>

- liraglutide 3 mg ~ semaglutide 1.7 mg
- tirzepatide 5 mg ~ semaglutide 2.4 mg < tirzepatide 10 to 15 mg

*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.*

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