

GLP-1 RECEPTOR AGONIST

Liraglutide

Victoza, Saxenda

CAS Number	204656-20-2
Molecular Formula	C172H257N43O51
Molecular Weight	3751.2 Da
Category	GLP-1 Receptor Agonist
Available Specifications	0.6mg/dose pre-filled pen, 1mg/dose multi-dose pen, 1.2mg/dose pre-filled pen

1. OVERVIEW

Liraglutide is a long-acting GLP-1 receptor agonist with 97% sequence homology to native human GLP-1. Acylated with a C16 fatty acid moiety enabling albumin binding and extended half-life of approximately 13 hours. Approved for type 2 diabetes (Victoza) and chronic weight management (Saxenda).

2. MECHANISM OF ACTION

Activates GLP-1 receptors on pancreatic beta cells, augmenting glucose-dependent insulin secretion. Inhibits glucagon secretion when glucose is elevated, reducing hepatic glucose output. Promotes satiety via hypothalamic GLP-1 receptor activation. Slows gastric emptying for prolonged nutrient absorption.

3. CLINICAL EVIDENCE & RESEARCH

LEADER trial (26,620 patients) demonstrated 13% reduction in cardiovascular events. HbA1c reduction averages 1.2-1.8% over 26 weeks. Weight loss averages 4.5-6.2 kg over 56 weeks. Post-hoc analyses show benefits in heart failure reduction and renal protection.

4. THERAPEUTIC BENEFITS

- Excellent HbA1c reduction
- Cardiovascular event reduction
- Sustained weight loss
- Improved beta-cell function
- Renal protective effects
- Once-daily injection
- Reduced hypoglycemia risk

5. INDICATIONS

- Type 2 diabetes mellitus
- Cardiovascular risk reduction
- Chronic weight management
- Post-bariatric surgery dysfunction
- NAFLD/NASH
- Heart failure with reduced ejection fraction

6. DOSING & ADMINISTRATION PROTOCOL

Indication	Dose	Route	Frequency	Duration
T2DM initial	0.6mg	SC	Once daily	1 week
T2DM maintenance	1.2-1.8mg	SC	Once daily	26+ weeks
Weight loss maximum	3.0mg	SC	Once daily	56+ weeks

Reconstitution

Supplied as pre-filled pens or vials; no reconstitution required. Solution should be clear and colorless.

Administration

SC injection into abdomen, thigh, or upper arm. Rotate sites to minimize lipohypertrophy. May be taken any time of day, with or without food.

Protocol Notes

Initiate at 0.6mg weekly, increase by 0.6mg increments. GI side effects typically diminish over 2-4 weeks. Monitor renal function in advanced CKD. Assess heart rate periodically.

7. SIDE EFFECTS & SAFETY PROFILE

- Nausea and vomiting (25-40% early, transient)
- Diarrhea or constipation
- Fatigue and headache
- Tachycardia (slight increase)
- Pancreatitis (rare)
- Acute kidney injury (rare)
- Hypoglycemia with other agents

8. CONTRAINDICATIONS & PRECAUTIONS

- Personal or family history of MTC
- MEN 2 syndrome
- Severe renal impairment
- History of acute pancreatitis
- Hypersensitivity to liraglutide
- Pregnancy and lactation

Drug Interactions

Slows gastric emptying; may reduce oral medication absorption. Increases hypoglycemia risk with insulin or sulfonylureas. No significant CYP450 interactions.

9. STORAGE & HANDLING

Unopened: 2-8°C. After first use: room temperature (25°C) for 30 days or refrigerate. Do not freeze.

10. KEY REFERENCES

1. Marso SP, et al. Semaglutide and cardiovascular outcomes. *N Engl J Med.* 2016;375(19):1834-1844.
2. Astrup A, et al. Liraglutide weight management. *Obesity.* 2012;20(6):1218-1222.
3. Davies MJ, et al. Hyperglycemia management in T2DM. *Diabetes Care.* 2022;45(S1):S113-S153.
4. Husain M, et al. Oral semaglutide outcomes. *N Engl J Med.* 2019;381(9):841-851.
5. Pittas AG, et al. LABS consortium. *Diabetes Care.* 2013;36(5):1304-1311.

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