

Liraglutide — Basic Review Questions

1. What class of medication is liraglutide, and what is it used to treat?

Answer: Liraglutide is a GLP-1 receptor agonist (an incretin mimetic) — the same class as semaglutide, and in fact its predecessor. It is FDA-approved for type 2 diabetes (sold as Victoza), chronic weight management/obesity including in adolescents (sold as Saxenda), and cardiovascular risk reduction. It is given as a once-daily subcutaneous injection.

2. How does liraglutide lower blood sugar, and why does it rarely cause hypoglycemia?

Answer: It increases insulin release and decreases glucagon, but only when blood glucose is elevated — a glucose-dependent effect. When glucose is normal or low, it stops driving insulin release, so it rarely causes low blood sugar on its own, unlike sulfonylureas or insulin. It also slows how quickly the stomach empties, which blunts the rise in glucose after meals. The body's emergency (counter-regulatory) glucagon response is preserved, so the liver can still raise glucose if it drops.

3. How does liraglutide cause weight loss?

Answer: Mainly by acting on the brain's appetite centers in the hypothalamus, where it reduces hunger and increases the feeling of fullness. It also slows stomach emptying, so people stay full longer and tend to eat less. Together these reduce calorie intake — the weight loss is not just fluid/diuresis.

4. How is liraglutide dosed, and how are its side effects managed?

Answer: It is given once daily (unlike weekly semaglutide), starting at a low dose (0.6 mg) and increasing in steps. Those dose increases are the main source of GI side effects — nausea, diarrhea, and vomiting — which are usually temporary and settle within a few weeks at a stable dose. The standard escalation is too fast for many people, so a slower pace (holding longer at each step and never advancing while symptomatic) improves tolerability. A target weight-loss rate of about 0.5–0.75 lb/week helps preserve muscle and minimize side effects.

5. What are the key clinical trial findings a clinician should know?

Answer: LEADER (about 9,340 patients with type 2 diabetes at high cardiovascular risk) showed liraglutide reduced major cardiovascular events by 13%, cardiovascular death by 22%, and all-cause death by 15% — making it the first GLP-1 drug to prove a cardiovascular mortality benefit and establishing the whole class as cardioprotective. The SCALE obesity program showed about 8% weight loss and, in people with prediabetes, a 71% lower rate of progressing to type 2 diabetes over three years. LEADER also showed kidney benefit (fewer renal events).

6. How does liraglutide compare with semaglutide and tirzepatide, and where does it still fit?

Answer: Liraglutide was the foundational GLP-1 drug — the first to prove the class does more than lower blood sugar. Newer agents have since surpassed it: semaglutide produces greater weight loss (about 10–15% vs. liraglutide's 5–8%) and HbA1c

reduction, and tirzepatide (a dual GLP-1/GIP drug) produces even more (15–22%). Liraglutide still has real advantages, though: it is once-daily, which allows finer dose titration and a faster offset if side effects require stopping; it has the longest safety track record; and it remains a guideline first-line option for type 2 diabetes with established cardiovascular disease, as well as a useful maintenance option.