# Tirzepatide reduced the risk of developing type 2 diabetes by 94% in adults with pre-diabetes and obesity or overweight

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*176-week SURMOUNT-1 Phase 3 study in adults with pre-diabetes is the longest completed trial of tirzepatide to date*

*Tirzepatide resulted in sustained weight loss through the treatment period, averaging a 22.9% decrease in body weight with the 15 mg dose at end of treatment*

*Results are consistent with the combined pharmacology of GIP and GLP-1 receptor agonism*

INDIANAPOLIS, Aug. 20, 2024 /PRNewswire/ -- Eli Lilly and Company (NYSE: LLY) announced today positive topline results from the SURMOUNT-1 three-year study (176-week treatment period) evaluating the efficacy and safety of tirzepatide (Zepbound® and Mounjaro®) once weekly for long-term weight management and delay in progression to diabetes in adults with pre-diabetes and obesity or overweight. Weekly tirzepatide injections (5 mg[i], 10 mg, 15 mg) significantly reduced the risk of progression to type 2 diabetes by 94% [ii] among adults with pre-diabetes and obesity or overweight compared to placebo. Additionally, treatment with tirzepatide resulted in sustained weight loss through the treatment period, with adults on the 15 mg dose experiencing a 22.9% [ii] average decrease in body weight compared to 2.1% for placebo in adults with pre-diabetes and obesity or overweight at the end of the treatment period.

"Obesity is a chronic disease that puts nearly 900 million adults worldwide at an increased risk of other complications such as type 2 diabetes," said Jeff Emmick, M.D., Ph.D., senior vice president, product development, Lilly. "Tirzepatide reduced the risk of developing type 2 diabetes by 94% and resulted in sustained weight loss over the three-year treatment period. These data reinforce the potential clinical benefits of long-term therapy for people living with obesity and pre-diabetes."

Tirzepatide was evaluated in 1,032 adults who had pre-diabetes at randomization and obesity or overweight for a treatment period of 176 weeks, followed by a 17-week off-treatment period (193 weeks in total). Results from the SURMOUNT-1 phase 3 study's primary analysis at 72 weeks in all participants were published in the *New England Journal of Medicine* in 2022.

In a key secondary endpoint, tirzepatide led to a significant reduction in the risk of progression to type 2 diabetes in adults with pre-diabetes and obesity or overweight from baseline to week 176 ($p<0.0001$, controlled for type 1 error). For the efficacy estimand[ii], pooled doses of tirzepatide achieved significant results, demonstrating a 94% reduction in risk of progression to type 2 diabetes compared to placebo up to week 176. For the treatment-regimen estimand[iii], pooled doses of tirzepatide resulted in a significant 93% reduction in risk of progression to type 2 diabetes compared to placebo up to week 176.

In an additional key secondary endpoint, tirzepatide (10 mg and 15 mg) led to statistically significant weight reduction compared to placebo in adults with pre-diabetes and obesity or overweight from baseline to week 176 ($p<0.001$, controlled for type 1 error). For the efficacy estimand[ii], adults taking tirzepatide achieved average weight reductions of 15.4% (5 mg[i]), 19.9% (10 mg) and 22.9% (15 mg) compared to placebo (2.1%) at week 176. For the treatment-regimen estimand[iii], adults taking tirzepatide achieved average weight reductions of 12.3% (5 mg [i]), 18.7% (10 mg) and 19.7% (15 mg) compared to placebo (1.3%) at week 176.

During the 17-week off-treatment follow-up period, those who had discontinued from tirzepatide began to regain weight and had some increase in the progression to type 2 diabetes, resulting in an 88% reduction ($p<0.0001$, controlled for type 1 error) in the risk of progression to type 2 diabetes compared to placebo.

The overall safety and tolerability profile of tirzepatide over the 193-week study was consistent with the previously published primary results at 72 weeks in SURMOUNT-1 and other tirzepatide clinical studies conducted for chronic weight management. The most frequently reported adverse events were typically gastrointestinal-related and generally mild to moderate in severity. The most common gastrointestinal-related adverse events for patients treated with tirzepatide were diarrhea, nausea, constipation and vomiting.

Tirzepatide, a GIP and GLP-1 receptor agonist, works by activating the two hormone receptors. GLP-1 is a regulator of appetite and caloric intake. Nonclinical studies suggest the addition of GIP may further contribute to the regulation of food intake. Tirzepatide decreases calorie intake, and the effects are likely mediated by affecting appetite. In addition, tirzepatide stimulates insulin secretion in a glucose-dependent manner. Tirzepatide increases insulin sensitivity in patients with type 2 diabetes mellitus and these effects can lead to a reduction of blood glucose.

These topline results provide evidence for reduced risk of progression to type 2 diabetes and long-term maintenance of weight loss with tirzepatide in adults with pre-diabetes and obesity or overweight. Detailed results will be submitted to a peer-reviewed journal and presented at ObesityWeek 2024, which will take place November 3-6.

**About SURMOUNT-1**

SURMOUNT-1 (NCT04184622) was a multi-center, randomized, double-blind, parallel, placebo-controlled trial comparing the efficacy and safety of tirzepatide 5 mg, 10 mg and 15 mg to placebo as an adjunct to a reduced-calorie diet and increased physical activity in adults without type 2 diabetes who have obesity, or overweight with at least one of the following comorbidities: hypertension, dyslipidemia, obstructive sleep apnea (OSA) or cardiovascular disease. The 1,032 participants who had pre-diabetes at study commencement remained enrolled in SURMOUNT-1 for an additional 104 weeks of treatment following the initial 72-week completion date to evaluate the impact on body weight and potential differences in progression to

type 2 diabetes at three years of treatment with tirzepatide compared to placebo.

**About tirzepatide**
Tirzepatide is a once-weekly GIP (glucose-dependent insulinotropic polypeptide) receptor and GLP-1 (glucagon-like peptide-1) receptor agonist. Tirzepatide is a single molecule that activates the body's receptors for GIP and GLP-1, which are natural incretin hormones. Both GIP and GLP-1 receptors are found in areas of the human brain important for appetite regulation. Tirzepatide has been shown to decrease food intake and modulate fat utilization. Studies of tirzepatide in chronic kidney disease (CKD) and in morbidity/mortality in obesity (MMO) are also ongoing. Lilly submitted data for tirzepatide in moderate-to-severe obstructive sleep apnea (OSA) and obesity to the U.S. Food and Drug Administration (FDA) and other global regulatory agencies earlier this year. Lilly plans to submit data for tirzepatide in heart failure with preserved ejection fraction (HFpEF) and obesity to the U.S. FDA and other global regulatory agencies later this year.

Tirzepatide was approved by the U.S. FDA as Mounjaro® for adults with type 2 diabetes to improve glycemic control on May 13, 2022, and as Zepbound® for adults with obesity (a BMI of 30 kg/m2 or greater) or those who are overweight (a BMI of 27 kg/m2 or greater) who also have a weight-related comorbid condition on November 8, 2023. Tirzepatide is also commercialized as Mounjaro® in some global markets outside the U.S. for adults with obesity or those who are overweight who also have a weight-related comorbid condition.

Tirzepatide is the only approved GIP (glucose-dependent insulinotropic polypeptide) and GLP-1 (glucagon-like peptide-1) treatment for chronic weight management. Both Mounjaro® and Zepbound® should be used as an adjunct to diet and exercise.

**INDICATION AND SAFETY SUMMARY WITH WARNINGS**

Zepbound® (ZEHP-bownd) is an injectable prescription medicine that may help adults with obesity, or with excess weight (overweight) who also have weight-related medical problems, lose weight and keep it off. It should be used with a reduced-calorie diet and increased physical activity.

- Zepbound contains tirzepatide and should not be used with other tirzepatide-containing products or any GLP-1 receptor agonist medicines. It is not known if Zepbound is safe and effective when taken with other prescription, over-the-counter, or herbal weight loss products. It is not known if Zepbound can be used in people who have had pancreatitis. It is not known if Zepbound is safe and effective for use in children under 18 years of age.

**Warnings -** Zepbound may cause tumors in the thyroid, including thyroid cancer. Watch for possible symptoms, such as a lump or swelling in the neck, hoarseness, trouble swallowing, or shortness of breath. If you have any of these symptoms, tell your healthcare provider.

- Do not use Zepbound if you or any of your family have ever had a type of thyroid cancer called medullary thyroid carcinoma (MTC).
- Do not use Zepbound if you have Multiple Endocrine Neoplasia syndrome type 2 (MEN 2).
- Do not use Zepbound if you have had a serious allergic reaction to tirzepatide or any of the ingredients in Zepbound.

**Zepbound may cause serious side effects, including:**

**Severe stomach problems.** Stomach problems, sometimes severe, have been reported in people who use Zepbound. Tell your healthcare provider if you have stomach problems that are severe or will not go away.

**Kidney problems (kidney failure)**. Diarrhea, nausea, and vomiting may cause a loss of fluids (dehydration), which may cause kidney problems. It is important for you to drink fluids to help reduce your chance of dehydration.

**Gallbladder problems.** Gallbladder problems have happened in some people who use Zepbound. Tell your healthcare provider right away if you get symptoms of gallbladder problems, which may include pain in your upper stomach (abdomen), fever, yellowing of skin or eyes (jaundice), or clay-colored stools.

**Inflammation of the pancreas (pancreatitis).** Stop using Zepbound and call your healthcare provider right away if you have severe pain in your stomach area (abdomen) that will not go away, with or without vomiting. You may feel the pain from your abdomen to your back.

**Serious allergic reactions.** Stop using Zepbound and get medical help right away if you have any symptoms of a serious allergic reaction, including swelling of your face, lips, tongue or throat, problems breathing or swallowing, severe rash or itching, fainting or feeling dizzy, or very rapid heartbeat.

**Low blood sugar (hypoglycemia).** Your risk for getting low blood sugar may be higher if you use Zepbound with medicines that can cause low blood sugar, such as a sulfonylurea or insulin. **Signs and symptoms of low blood sugar may include** dizziness or light-headedness, sweating, confusion or drowsiness, headache, blurred vision, slurred speech, shakiness, fast heartbeat, anxiety, irritability, mood changes, hunger, weakness or feeling jittery.

**Changes in vision in patients with type 2 diabetes.** Tell your healthcare provider if you have changes in vision during treatment with Zepbound.

**Depression or thoughts of suicide.** You should pay attention to changes in your mood, behaviors, feelings or thoughts. Call your healthcare provider right away if you have any mental changes that are new, worse, or worry you.

**Common side effects**

The most common side effects of Zepbound include nausea, diarrhea, vomiting, constipation, stomach (abdominal) pain, indigestion, injection site reactions, feeling tired, allergic reactions, belching, hair loss, and heartburn. These are not all the possible side effects of Zepbound. Talk to your healthcare provider about any side effect that bothers you or doesn't go away.

Tell your healthcare provider if you have any side effects. **You can report side effects at 1-800-FDA-1088 or** www.fda.gov/medwatch.

**Before using Zepbound**

- **Your healthcare provider should show you how to use Zepbound before you use it for the first time.**
- **Tell your healthcare provider if you are taking medicines to treat diabetes including insulin or sulfonylureas which could increase your risk of low blood sugar. Talk to your healthcare provider about low blood sugar levels and how to manage them.**
- **If you take birth control pills by mouth, talk to your healthcare provider before you use Zepbound. Birth control pills may not work as well while using Zepbound.** Your healthcare provider may recommend another type of birth control for 4 weeks after you start Zepbound and for 4 weeks after each increase in your dose of Zepbound.

**Review these questions with your healthcare provider:**

❑ Do you have other medical conditions, including problems with your pancreas or kidneys, or severe problems with your stomach, such as slowed emptying of your stomach (gastroparesis) or problems digesting food?
❑ Do you take diabetes medicines, such as insulin or sulfonylureas?
❑ Do you have a history of diabetic retinopathy?
❑ Do you take any other prescription medicines or over-the-counter drugs, vitamins, or herbal supplements?
❑ Are you pregnant, plan to become pregnant, breastfeeding, or plan to breastfeed? Zepbound may harm your unborn baby. Tell your healthcare provider if you become pregnant while using Zepbound. It is not known if Zepbound passes into your breast milk. You should talk with your healthcare provider about the best way to feed your baby while using Zepbound.

- **Pregnancy Exposure Registry:** There will be a pregnancy exposure registry for women who have taken Zepbound during pregnancy. The purpose of this registry is to collect information about the health of you and your baby. Talk to your healthcare provider about how you can take part in this registry, or you may contact Lilly at 1-800-LillyRx (1-800-545-5979).

**How to take**

- Read the **Instructions for Use** that come with Zepbound.
- Use Zepbound exactly as your healthcare provider says.
- Zepbound is injected under the skin (subcutaneously) of your stomach (abdomen), thigh, or upper arm.
- **Use Zepbound 1 time each week, at any time of the day.**
- Change (rotate) your injection site with each weekly injection. **Do not** use the same site for each injection.
- If you take too much Zepbound, call your healthcare provider, seek medical advice promptly, or contact a Poison Center expert right away at 1-800-222-1222.

**Learn more**

Zepbound is a prescription medicine. For more information, call 1-800-LillyRx (1-800-545-5979) or go to **www.zepbound.lilly.com.**

This summary provides basic information about Zepbound but does not include all information known about this medicine. Read the information that comes with your prescription each time your prescription is filled. This information does not take the place of talking with your healthcare provider. Be sure to talk to your healthcare provider about Zepbound and how to take it. Your healthcare provider is the best person to help you decide if Zepbound is right for you.

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**INDICATION AND SAFETY SUMMARY WITH WARNINGS**

Mounjaro® (mown-JAHR-OH) is an injectable medicine for adults with type 2 diabetes used along with diet and exercise to improve blood sugar (glucose).

- It is not known if Mounjaro can be used in people who have had inflammation of the pancreas (pancreatitis). Mounjaro is not for use in people with type 1 diabetes. It is not known if Mounjaro is safe and effective for use in children under 18 years of age.

**Warnings -** Mounjaro may cause tumors in the thyroid, including thyroid cancer. Watch for possible symptoms, such as a lump or swelling in the neck, hoarseness, trouble swallowing, or shortness of breath. If you have any of these symptoms, tell your healthcare provider.

- Do not use Mounjaro if you or any of your family have ever had a type of thyroid cancer called medullary thyroid carcinoma (MTC).
- Do not use Mounjaro if you have Multiple Endocrine Neoplasia syndrome type 2 (MEN 2).
- Do not use Mounjaro if you are allergic to it or any of the ingredients in Mounjaro.

**Mounjaro may cause serious side effects, including:**

**Inflammation of the pancreas (pancreatitis).** Stop using Mounjaro and call your healthcare provider right away if you have severe pain in your stomach area (abdomen) that will not go away, with or without vomiting. You may feel the pain from your abdomen to your back.

**Low blood sugar (hypoglycemia).** Your risk for getting low blood sugar may be higher if you use Mounjaro with another medicine that can cause low

blood sugar, such as a sulfonylurea or insulin. **Signs and symptoms of low blood sugar may include** dizziness or light-headedness, sweating, confusion or drowsiness, headache, blurred vision, slurred speech, shakiness, fast heartbeat, anxiety, irritability, or mood changes, hunger, weakness and feeling jittery.

**Serious allergic reactions.** Stop using Mounjaro and get medical help right away if you have any symptoms of a serious allergic reaction, including swelling of your face, lips, tongue or throat, problems breathing or swallowing, severe rash or itching, fainting or feeling dizzy, and very rapid heartbeat.

**Kidney problems (kidney failure)**. In people who have kidney problems, diarrhea, nausea, and vomiting may cause a loss of fluids (dehydration), which may cause kidney problems to get worse. It is important for you to drink fluids to help reduce your chance of dehydration.

**Severe stomach problems.** Stomach problems, sometimes severe, have been reported in people who use Mounjaro. Tell your healthcare provider if you have stomach problems that are severe or will not go away.

**Changes in vision.** Tell your healthcare provider if you have changes in vision during treatment with Mounjaro.

**Gallbladder problems.** Gallbladder problems have happened in some people who use Mounjaro. Tell your healthcare provider right away if you get symptoms of gallbladder problems, which may include pain in your upper stomach (abdomen), fever, yellowing of skin or eyes (jaundice), and clay-colored stools.

**Common side effects**

The most common side effects of Mounjaro include nausea, diarrhea, decreased appetite, vomiting, constipation, indigestion, and stomach (abdominal) pain. These are not all the possible side effects of Mounjaro. Talk to your healthcare provider about any side effect that bothers you or doesn't go away.

Tell your healthcare provider if you have any side effects. **You can report side effects at 1-800-FDA-1088 or** www.fda.gov/medwatch.

**Before using Mounjaro**

- **Your healthcare provider should show you how to use Mounjaro before you use it for the first time.**
- **Talk to your healthcare provider about low blood sugar and how to manage it.**
- **If you take birth control pills by mouth, talk to your healthcare provider before you use Mounjaro. Birth control pills may not work as well while using Mounjaro.** Your healthcare provider may recommend another type of birth control for 4 weeks after you start Mounjaro and for 4 weeks after each increase in your dose of Mounjaro.

**Review these questions with your healthcare provider:**

❑ Do you have other medical conditions, including problems with your pancreas or kidneys, or severe problems with your stomach, such as slowed emptying of your stomach (gastroparesis) or problems digesting food?
❑ Do you take other diabetes medicines, such as insulin or sulfonylureas?
❑ Do you have a history of diabetic retinopathy?
❑ Are you pregnant, plan to become pregnant, breastfeeding, or plan to breastfeed? It is not known if Mounjaro will harm your unborn baby or pass into your breast milk.
❑ Do you take any other prescription medicines or over-the-counter drugs, vitamins, or herbal supplements?

**How to take**

- Read the **Instructions for Use** that come with Mounjaro.
- Use Mounjaro exactly as your healthcare provider says.
- Mounjaro is injected under the skin (subcutaneously) of your stomach (abdomen), thigh, or upper arm.
- **Use Mounjaro 1 time each week, at any time of the day.**
- **Do not** mix insulin and Mounjaro together in the same injection.
- You may give an injection of Mounjaro and insulin in the same body area (such as your stomach area), but not right next to each other.
- Change (rotate) your injection site with each weekly injection. **Do not** use the same site for each injection.
- If you take too much Mounjaro, call your healthcare provider or seek medical advice promptly.

**Learn more**

Mounjaro is a prescription medicine. For more information, call 1-833-807-MJRO (833-807-6576) [or go to **www.mounjaro.com**].

This summary provides basic information about Mounjaro but does not include all information known about this medicine. Read the information that comes with your prescription each time your prescription is filled. This information does not take the place of talking with your healthcare provider. Be sure to talk to your healthcare provider about Mounjaro and how to take it. Your healthcare provider is the best person to help you decide if Mounjaro is right for you.

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**About Lilly**

Lilly is a medicine company turning science into healing to make life better for people around the world. We've been pioneering life-changing discoveries for nearly 150 years, and today our medicines help more than 51 million people across the globe. Harnessing the power of biotechnology, chemistry and genetic medicine, our scientists are urgently advancing new discoveries to solve some of the world's most significant health challenges: redefining diabetes care; treating obesity and curtailing its most devastating long-term effects; advancing the fight against Alzheimer's disease; providing solutions to some of the most debilitating immune system disorders; and transforming the most difficult-to-treat cancers into manageable diseases. With each step toward a healthier world, we're motivated by one thing: making life better for millions more people. That includes delivering innovative clinical trials that reflect the diversity of our world and working to ensure our medicines are accessible and affordable. To learn more, visit Lilly.com and Lilly.com/news, or follow us on Facebook, Instagram and LinkedIn. P-LLY

[i] Not controlled for type 1 error.

[ii] The efficacy estimand represents efficacy had all patients remained on randomized treatment for the entire planned treatment duration (up to 176 weeks).

[iii] The treatment-regimen estimand represents efficacy regardless of adherence to randomized treatment.

**Cautionary Statement Regarding Forward-Looking Statements**

This press release contains forward-looking statements (as that term is defined in the Private Securities Litigation Reform Act of 1995), including statements about tirzepatide injection for the treatment of adults with type 2 diabetes, tirzepatide as a potential long-term therapy for adults with pre-diabetes and obesity or overweight and the timeline for future presentations and other milestones relating to tirzepatide and its clinical trials, and reflects Lilly's current belief and expectations. However, as with any pharmaceutical product, there are substantial risks and uncertainties in the process of research development and commercialization. Among other things, there can be no guarantee that planned or ongoing studies will be completed as planned, that future study results will be consistent with the results to date, that tirzepatide will receive additional regulatory approvals, or that tirzepatide will be commercially successful. For further discussion of these and other risks and uncertainties, see Lilly's most recent Form 10-K and Form 10-Q filings with the United States Securities and Exchange Commission. Except as required by law, Lilly undertakes no duty to update forward-looking statements to reflect events after the date of this release.

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View original content to download multimedia:https://www.prnewswire.com/news-releases/tirzepatide-reduced-the-risk-of-developing-type-2-diabetes-by-94-in-adults-with-pre-diabetes-and-obesity-or-overweight-302225947.html

SOURCE Eli Lilly and Company