▼This medicinal product is subject to additional monitoring in Australia due to approval of an extension of indications. This will allow quick identification of new safety information. Healthcare professionals are asked to report any suspected adverse events at www.tga.gov.au/reporting-problems.

AUSTRALIAN PRODUCT INFORMATION

MOUNJARO® (TIRZEPATIDE) SOLUTION FOR INJECTION

MOUNJARO® KWIKPEN® (TIRZEPATIDE) SOLUTION FOR INJECTION

1 NAME OF THE MEDICINE

Tirzepatide

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Single-dose vial and pre-filled pen (autoinjector)

MOUNJARO tirzepatide 2.5 mg/0.5 mL solution for injection vial and pre-filled pen

Each vial and pre-filled pen contains tirzepatide 2.5 mg in 0.5 mL solution.

MOUNJARO tirzepatide 5 mg/0.5 mL solution for injection vial and pre-filled pen

Each vial and pre-filled pen contains tirzepatide 5 mg in 0.5 mL solution.

MOUNJARO tirzepatide 7.5 mg/0.5 mL solution for injection vial and pre-filled pen

Each vial and pre-filled pen contains tirzepatide 7.5 mg in 0.5 mL solution.

MOUNJARO tirzepatide 10 mg/0.5 mL solution for injection vial and pre-filled pen

Each vial and pre-filled pen contains tirzepatide 10 mg in 0.5 mL solution.

MOUNJARO tirzepatide 12.5 mg/0.5 mL solution for injection vial and pre-filled pen

Each vial and pre-filled pen contains tirzepatide 12.5 mg in 0.5 mL solution.

MOUNJARO tirzepatide 15 mg/0.5 mL solution for injection vial and pre-filled pen

Each vial and pre-filled pen contains tirzepatide 15 mg in 0.5 mL solution.

Multiple-dose pre-filled pen (KwikPen®)

MOUNJARO KwikPen tirzepatide 4.17 mg/mL solution for injection multiple-dose pre-filled pen

Each multiple-dose pre-filled pen delivers four 0.6 mL doses containing 2.5 mg tirzepatide.

MOUNJARO KwikPen tirzepatide 8.33 mg/mL solution for injection multiple-dose pre-filled pen

Each multiple-dose pre-filled pen delivers four 0.6 mL doses containing 5 mg tirzepatide.

MOUNJARO KwikPen tirzepatide 12.5 mg/mL solution for injection multiple-dose pre-filled pen

Each multiple-dose pre-filled pen delivers four 0.6 mL doses containing 7.5 mg tirzepatide.

MOUNJARO KwikPen tirzepatide 16.67 mg/mL solution for injection multiple-dose pre-filled pen

Each multiple-dose pre-filled pen delivers four 0.6 mL doses containing 10 mg tirzepatide.

MOUNJARO KwikPen tirzepatide 20.83 mg/mL solution for injection multiple-dose pre-filled pen

Each multiple-dose pre-filled pen delivers four 0.6 mL doses containing 12.5 mg tirzepatide.

MOUNJARO KwikPen tirzepatide 25 mg/mL solution for injection multiple-dose pre-filled pen

Each multiple-dose pre-filled pen delivers four 0.6 mL doses containing 15 mg tirzepatide.

For the full list of excipients, see section **6.1 List of excipients**.

3 PHARMACEUTICAL FORM

Solution for Injection.

MOUNJARO is a clear, colourless to slightly yellow, sterile solution for subcutaneous administration. The single dose vial and pre-filled pen are preservative-free. The multiple-dose pre-filled pen contains preservatives.

4 CLINICAL PARTICULARS

4.1 THERAPEUTIC INDICATIONS

Type 2 diabetes mellitus (T2DM)

MOUNJARO is indicated for the treatment of adults with insufficiently controlled type 2 diabetes mellitus as an adjunct to diet and exercise

- as monotherapy when metformin is not tolerated or contraindicated.
- in addition to other medicinal products for the treatment of type 2 diabetes.

MOUNJARO is indicated for the treatment of adolescents and children aged 10 years and above weighing 50 kg or more with insufficiently controlled type 2 diabetes mellitus as an adjunct to diet and exercise

- as monotherapy when metformin is not tolerated or contraindicated.
- in addition to other medicinal products for the treatment of type 2 diabetes.

See sections **5.1 Pharmacodynamic properties – Clinical Trials** and **5.2 Pharmacokinetic properties** for additional information.

Chronic Weight Management (CWM)

MOUNJARO is indicated as an adjunct to a reduced-calorie diet and increased physical activity for chronic weight management, including weight loss and weight maintenance, in adults with an initial body mass index (BMI) of:

- ≥30 kg/m^2 (obesity) or
- ≥27 kg/m^2 to <30 kg/m^2 (overweight) in the presence of at least one weight-related comorbid condition (e.g., hypertension, dyslipidaemia, obstructive sleep apnoea, cardiovascular disease, prediabetes or type 2 diabetes mellitus).

Obstructive Sleep Apnoea (OSA)

MOUNJARO is indicated for the treatment of moderate to severe obstructive sleep apnoea in adults with obesity.

4.2 DOSE AND METHOD OF ADMINISTRATION

The starting dose of tirzepatide is 2.5 mg once weekly.

After 4 weeks, increase the dose to 5 mg once weekly.

If needed, dose increases can be made in 2.5 mg increments after a minimum of 4 weeks on the current dose.

Adults (≥ 18 years)

The recommended doses are 5 mg, 10 mg and 15 mg.

The 2.5 mg, 7.5 mg and 12.5 mg are not maintenance doses.

The maximum dose of tirzepatide is 15 mg once weekly.

Children and adolescents (aged 10 to <18 years) for the treatment of T2DM

The recommended doses are 5 mg and 10 mg.

The maximum dose is 10 mg once weekly.

In children and adolescents weighing 60 kg or less, caution is advised when escalating to the 10 mg dose, since safety data are limited. Based on PopPK analyses, tirzepatide exposure in children and adolescents weighing 60 kg or less dosed with 10 mg weekly may exceed the exposure observed in adults dosed with 15 mg weekly (see **5.2 Pharmacokinetic properties**).

Available doses are 2.5 mg, 5 mg, 7.5 mg, 10 mg, 12.5 mg and 15 mg (see section **2 Qualitative and Quantitative Composition**).

The MOUNJARO KwikPen is a variable dosing device and there is potential for underdosing in patients if used incorrectly. Please refer to the Instructions for Use leaflet in the carton and

ensure the dose knob on the MOUNJARO KwikPen device is turned to the '1' icon to inject a full dose.

Self-monitoring of blood glucose is not needed to adjust the dose of tirzepatide.

When tirzepatide is added to existing metformin and/or sodium-glucose co-transporter 2 inhibitor (SGLT2i) therapy, the current dose of metformin and/or SGLT2i can be continued.

When tirzepatide is added to existing therapy of a sulfonylurea and/or insulin, a reduction in the dose of sulfonylurea or insulin may be considered to reduce the risk of hypoglycaemia. Blood glucose self-monitoring is necessary to adjust the dose of sulfonylurea and insulin. A stepwise approach to insulin reduction is recommended. (see sections **4.4 Special warnings and precautions for use** and **4.8 Adverse effects (Undesirable effects)**).

Missed dose

If a dose is missed, it should be administered as soon as possible.

If there are fewer than 3 days until the next regularly scheduled dose, skip the missed dose and administer the next dose on the regularly scheduled day. Patients can then resume their regular once weekly dosing schedule.

Changing the weekly dosing schedule

The day of weekly administration can be changed, if necessary, as long as the time between two doses is at least 3 days (72 hours).

Special population

Use in the elderly (≥ 65 years)

No dose adjustment is needed based on age.

Gender and body weight

No dose adjustment is needed based on gender or body weight.

Race and Ethnicity

No dose adjustment is needed based on race and ethnicity.

Renal impairment

No dose adjustment is needed in patients with renal impairment (including end-stage renal disease). Experience with the use of tirzepatide in patients with severe renal impairment and ESRD is limited. Caution should be exercised when treating these patients with tirzepatide.

Hepatic impairment

No dose adjustment is needed in patients with hepatic impairment. Experience with the use of tirzepatide in patients with severe hepatic impairment is limited. Caution should be exercised when treating these patients with tirzepatide.

Paediatric population

No adjustment to the paediatric population dose is needed based on age, gender, race, ethnicity or body weight in children and adolescents aged 10 to less than 18 years treated for T2DM. However, in children weighing less than 60 kg, caution is advised when escalating to the 10 mg dose, since safety data are limited (see section **5.2 Pharmacokinetic properties**).

No data are available for children and adolescents with T2DM with a body weight of less than 50 kg, or a BMI below the 85th percentile at treatment initiation.

The safety and efficacy of tirzepatide have not been established in children aged less than 10 years for the treatment of T2DM and in children and adolescents less than 18 years in other indications.

Method of Administration

MOUNJARO can be injected at any time of the day, with or without meals.

Inject MOUNJARO subcutaneously in the abdomen or thigh.

It is recommended to rotate injection sites with each dose.

Patients or caregivers should be advised to carefully read the Instructions for Use included with the package leaflet before administering the medicinal product. In children and adolescents aged 10 to less than 18 years for the treatment of T2DM, a caregiver may give injections, or a patient may self-inject if a healthcare professional determines that it is appropriate.

Single-dose vial and pre-filled pen: Preservative-free, for single use in one patient only. Discard any residue.

Multiple-dose pre-filled pen: for single-patient use only.

4.3 CONTRAINDICATIONS

MOUNJARO is contraindicated in patients with known hypersensitivity to tirzepatide or any of the excipients listed in section **6.1 List of excipients**.

4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE

MOUNJARO should not be used in patients with Type 1 diabetes mellitus or for the treatment of diabetic ketoacidosis.

Acute pancreatitis

Tirzepatide has not been studied in patients with a history of pancreatitis and should be used in caution with these patients.

Acute pancreatitis has been reported in patients treated with tirzepatide.

Patients should be informed of the symptoms of acute pancreatitis. If pancreatitis is suspected, tirzepatide should be discontinued. If the diagnosis of pancreatitis is confirmed,

tirzepatide should not be restarted. In the absence of other signs and symptoms of pancreatitis, elevations in pancreatic enzymes alone are not predictive of acute pancreatitis.

Hypoglycaemia in patients with T2DM

Patients receiving tirzepatide in combination with an insulin secretagogue (for example, a sulfonylurea) or insulin may have an increased risk of hypoglycaemia. The risk of hypoglycaemia may be lowered by a reduction in the dose of the insulin secretagogue or insulin (see sections **4.2 Dose and method of administration** and **4.8 Adverse effects (Undesirable effects)**).

Gastrointestinal effects

Tirzepatide has been associated with gastrointestinal adverse reactions, which include nausea, vomiting, and diarrhoea (see section **4.8 Adverse effects (Undesirable effects)**). These events may lead to dehydration, which could cause a deterioration in renal function, including acute renal failure.

Patients treated with tirzepatide should be advised of the potential risk of dehydration, particularly in relation to gastrointestinal adverse reactions and take precautions to avoid fluid depletion. Monitor renal function when initiating or escalating doses of MOUNJARO in patients with renal impairment reporting severe gastrointestinal adverse reactions.

Severe gastrointestinal disease

Tirzepatide has not been studied in patients with severe gastrointestinal disease, including severe gastroparesis, and should be used with caution in these patients. Events related to impaired gastric emptying, including severe gastroparesis, have been reported. Monitor and consider dose modification or discontinuation in patients who develop severe gastrointestinal symptoms while on treatment.

Malnutrition

Events related to malnutrition have been reported, including severe, in patients receiving tirzepatide. Risks associated with malnutrition include, but are not limited to, vitamin and mineral deficiency, protein deficiency, and low body weight. Balanced nutritional support should be considered. Discontinuation should be considered for severe or persistent cases.

Diabetic retinopathy

Rapid improvement in glucose control has been associated with a temporary worsening of diabetic retinopathy. Tirzepatide has not been studied in patients with non-proliferative diabetic retinopathy requiring acute therapy, proliferative diabetic retinopathy or diabetic macular oedema, and should be used with caution in these patients with appropriate monitoring.

Pulmonary aspiration

Tirzepatide delays gastric emptying. Pulmonary aspiration has been reported in patients receiving long acting GLP-1 receptor agonists undergoing general anaesthesia or deep sedation. This should be considered prior to such procedures.

Psychiatric disorders

Suicidal behaviour and ideation have been reported with GLP-1 receptor agonists. Monitor patients for the emergence or worsening of depression, suicidal thoughts or behaviours, and/or any unusual changes in mood or behaviour. Consider the benefits and risks for individual patients prior to initiating or continuing therapy in patients with suicidal thoughts or behaviours or have a history of suicidal attempts.

Congestive heart failure

There is limited therapeutic experience in patients with congestive heart failure.

Benzyl alcohol

MOUNJARO KwikPen contains 5.4 mg benzyl alcohol in each 0.6 mL dose. Benzyl alcohol may cause allergic reactions.

Patients with hepatic or renal impairment should be informed of the potential risk of metabolic acidosis due to accumulation of benzyl alcohol over time.

Use in hepatic impairment

No dose adjustment is needed in patients with hepatic impairment (see section **5.2 Pharmacokinetic properties**). Experience with the use of tirzepatide in patients with severe hepatic impairment is limited. Caution should be exercised when treating these patients with tirzepatide.

Use in renal impairment

No dose adjustment is needed in patients with renal impairment (including end-stage renal disease) (see section **5.2 Pharmacokinetic properties**). Experience with the use of tirzepatide in patients with severe renal impairment and ESRD is limited. Caution should be exercised when treating these patients with tirzepatide.

Use in the elderly

No dose adjustment is required based on age. Only very limited data are available from patients aged ≥ 85 years.

Paediatric use

The safety and efficacy of tirzepatide have not yet been established in children aged less than 10 years for the treatment of T2DM and in children and adolescents less than 18 years in other indications.

Effects on laboratory tests

No information on the effect of tirzepatide on laboratory tests is available.

4.5 INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTIONS

Tirzepatide delays gastric emptying and has the potential to affect the rate of absorption of concomitantly administered oral medications. This effect, resulting in decreased C_{max} and a delayed t_{max}, is most pronounced at the time of tirzepatide treatment initiation.

Based on the results from a study with paracetamol, which was used as a model medicinal product to evaluate the effect of tirzepatide on gastric emptying, it is not anticipated that tirzepatide treatment will result in a clinically meaningful impact on orally administered drugs that do not have a narrow therapeutic index. However, it is recommended to monitor patients on oral medicinal products that are dependent on threshold concentrations for efficacy and those with a narrow therapeutic index (e.g., warfarin, digoxin), especially during the early phase of treatment with tirzepatide and following any dose increase. The risk of delayed effect should also be considered for any oral medicinal product for which a rapid onset of effect is important.

Oral contraceptives

Administration of a combination oral contraceptive (0.035 mg ethinylestradiol plus 0.25 mg norgestimate) in the presence of a single dose of tirzepatide (5 mg) resulted in a reduction of oral contraceptive C_{max} by 55 to 66%, with a 16 to 23% reduction in area under the curve (AUC) and a delay in t_{max} of 2.5 to 4.5 hours. This reduction in exposure after a single 5 mg dose of tirzepatide is not considered clinically relevant. Doses other than a single 5 mg dose of tirzepatide were not investigated in this interaction study.

The reduction in exposure described above may be significant in a setting with concomitant administration of medicines also affecting those exposures. Appropriate contraception methods (including non-oral contraceptives) should be discussed with the patient based on the patient's individual circumstances prior to commencing tirzepatide. Reduced efficacy of oral contraceptives cannot be excluded, it is therefore advised that patients using oral hormonal contraceptives switch to a non-oral contraceptive method or add a barrier method of contraception for 4 weeks after initiation and for 4 weeks after each dose escalation with MOUNJARO.

4.6 FERTILITY, PREGNANCY AND LACTATION

Effects on fertility

The effect of tirzepatide on fertility in humans is unknown.

Tirzepatide did not affect fertility in male rats at doses up to 3 mg/kg/day, resulting in exposures 2 times the clinical AUC at the maximum recommended human dose (MRHD). In female rats, prolonged oestrus cycling and decreases in the mean numbers of corpora lutea, implantation sites, and viable embryos per litter was observed at subclinical exposures based on AUC at the MRHD.

Use in pregnancy

Pregnancy Category D.

There are no adequate and well-controlled studies of tirzepatide in pregnant women. Tirzepatide should not be used during pregnancy. Women of childbearing potential are advised to use contraception during treatment with tirzepatide (see section **4.5 Interactions with other medicines and other forms of interactions**). If a patient wishes to become pregnant or becomes pregnant, treatment with tirzepatide should be discontinued. Tirzepatide should be discontinued at least one month before a planned pregnancy based on half-life considerations (see section **5.2 Pharmacokinetic properties**).

Studies in animals have shown reproductive toxicity when tirzepatide was administered during organogenesis. In pregnant rats, embryofetal toxicity (increased post-implantation loss, impaired growth and an increased incidence of fetal abnormalities) was observed at subclinical plasma exposures. All developmental effects occurred at maternally toxic doses. Exposures at the No Observed Adverse Effects Level (NOAEL) were subclinical and a direct effect of tirzepatide on the fetus cannot be excluded.

Use in lactation

Following a single 5 mg dose, the concentration of tirzepatide in breastmilk was found to be undetectable to very low compared to plasma concentrations. As tirzepatide is an amino acid sequence, any low amount present in breastmilk is expected to be degraded and not orally absorbed as intact drug by the breastfed infant. Administer tirzepatide to nursing women only if the potential benefit to the mother justifies the potential risk to the infant. A risk to the newborns/infants cannot be excluded.

4.7 EFFECTS ON ABILITY TO DRIVE AND USE MACHINES

No studies on the effects on the ability to drive and use machines have been performed. When tirzepatide is used in combination with a sulfonylurea or insulin, patients should be advised to take precautions to avoid hypoglycaemia while driving and using machines (see section **4.4 Special warnings and precautions for use**).

4.8 ADVERSE EFFECTS (UNDESIRABLE EFFECTS)

Summary of safety profile

Type 2 diabetes mellitus (T2DM)

Adults

In 7 completed phase 3 studies, 5,119 patients were exposed to tirzepatide alone or in combination with other glucose lowering medicinal products. The most frequently reported adverse reactions in clinical studies were gastrointestinal disorders, including nausea (very common), diarrhoea (very common), constipation (common) and vomiting (common), see **Table 2**. In general, these reactions were mostly mild or moderate in severity and occurred more often during dose escalation and decreased over time. (see sections **4.2 Dose and method of administration** and **4.4 Special warnings and precautions for use**).

Children and adolescent patients, aged 10 to below 18 years

In 1 completed phase 3 study, 99 patients were exposed to tirzepatide. The frequencies of all adverse reactions were similar to those in adults with T2DM, with the exception of vomiting (very common), abdominal pain (very common), and hypoglycaemia with concomitant metformin alone (common), see **Table 3**. In general, gastrointestinal reactions were mild or moderate in severity and occurred more often during dose escalation and decreased over time (see sections **4.2 Dose and method of administration** and **4.4 Special warnings and precautions for use**).

Chronic Weight Management (CWM)

In 2 completed phase 3 studies, 2519 adult patients were exposed to tirzepatide. The most frequently reported adverse reactions were gastrointestinal disorders, including nausea (very common), diarrhoea (very common), constipation (very common), and vomiting (very common), see **Table 4**. In general, these reactions were mostly mild or moderate in severity and occurred more often during dose escalation and decreased over time (see sections **4.2 Dose and method of administration** and **4.4 Special warnings and precautions for use**). Adverse drug reactions in the CWM clinical trials were similar to those in the T2DM trials with the exception of the frequencies of abdominal pain (very common), constipation (very common) and vomiting (very common).

Obstructive Sleep Apnoea (OSA)

In 2 completed phase 3 studies, 233 adult patients were exposed to tirzepatide. The adverse reactions observed with MOUNJARO maximum tolerated dose (10 mg or 15 mg) were consistent with those reported in the two pooled placebo controlled clinical trials for chronic weight management.

Tabulated list of adverse reactions

The following related adverse reactions have been identified and are listed in **Table 1** as MedDRA preferred term by system organ class and in order of decreasing incidence (very common: ≥ 1/10; common: ≥ 1/100 to < 1/10; uncommon: ≥ 1/1,000 to < 1/100; rare: ≥ 1/10,000 to < 1/1,000; very rare: < 1/10,000) and not known (cannot be estimated from the available data). Within each incidence grouping, adverse reactions are presented in order of decreasing frequency.

Table 1 Adverse reactions in adult patients

System Organ Class Adverse Reaction Term	**Very Common ≥10%**	**Common ≥1% and <10%**	**Uncommon ≥0.1% and <1%**	**Rare ≥0.01% and <0.1%**	**Very Rare <0.01%**
Gastrointestinal Disorders					
Nausea	X				
Diarrhoea[a]	X				
Abdominal Pain[a,e]	X				
Vomiting[e]	X				
Dyspepsia		X			
Constipation[a,e]	X				
Abdominal Distension		X			
Eructation		X			
Flatulence		X			
Gastroesophageal Reflux Disease		X			
Cholelithiasis			X		
Acute Pancreatitis			X		
General Disorders and Administration Site Conditions					
Fatigue[a]		X			
Injection Site Reaction[a]		X			
Immune System Disorders					
Hypersensitivity		X			
Metabolism and Nutrition Disorders					
Decreased Appetite[b]		X			
Hypoglycaemia in patients with T2DM[c]					

Hypoglycaemia with concomitant secretagogues/insulin					
-add on to basal insulin, with or without metformin	X				
-add on to sulfonylurea, with or without metformin and/or SGLT-2i	X				
Hypoglycaemia without concomitant secretagogues/insulin					
- add on to metformin and SGLT2i		X			
- add on to metformin			X		
Nervous System Disorders					
Dizziness[d]		X			
Dysgeusia			X		
Skin and Subcutaneous Tissue Disorders					
Hair Loss[d]		X			
Vascular Disorders					
Hypotension[a,d]		X			

[a] **Includes the following MedDRA preferred terms:**
Diarrhoea: diarrhoea, frequent bowel movements;
Abdominal Pain: abdominal discomfort, abdominal pain, abdominal pain lower, abdominal pain upper, abdominal tenderness, gastrointestinal pain;
Constipation: constipation, faeces hard;
Fatigue: asthenia, fatigue, lethargy, malaise;
Injection Site Reaction: injection site bruising, injection site erythema, injection site haematoma, injection site haemorrhage, injection site hypersensitivity, injection site induration, injection site inflammation, injection site irritation, injection site pain, injection site paraesthesia, injection site pruritus, injection site rash, injection site reaction, injection site swelling;
Hypotension: blood pressure decreased, hypotension, orthostatic hypotension
[b] T2DM indication only
[c] hypoglycaemia with blood glucose <3.0 mmol/L or severe hypoglycaemia
[d] CWM and OSA indications only
[e] Frequency was very common in CWM and OSA trials and common in T2DM trials.

Table 2 Summary of treatment-emergent adverse events with frequency ≥5% in any treatment group in adult T2DM studies

Preferred Term	TZP 5 mg (N=237) %	TZP 10 mg (N=240) %	TZP 15 mg (N=241) %	TZP ALL (N=718) %	Placebo (N=235) %
Nausea	12.2	15.4	18.3	15.3	4.3
Diarrhoea	11.8	13.3	16.2	13.8	8.9
Nasopharyngitis	10.5	6.7	9.5	8.9	14.0
Decreased Appetite	5.5	9.6	11.2	8.8	1.3
Dyspepsia	8.0	7.5	5.4	7.0	2.6
Vomiting	5.1	5.0	9.1	6.4	2.1
Constipation	5.9	5.8	6.6	6.1	1.3
Lipase increased	3.0	1.3	5.4	3.2	2.6
Hyperglycaemia	2.5	2.1	1.7	2.1	20.0

N=number of patients in treatment group; TZP=tirzepatide

Table 3 Summary of treatment-emergent adverse events with frequency ≥5% in any treatment group in children and adolescents aged 10 to less than 18 years with T2DM

Preferred Term	**TZP 5 mg** (N=32) %	**TZP 10 mg** (N=33) %	**TZP_ALL** (N=65) %	**Placebo** (N=34) %
Diarrhoea	25.0	24.2	24.6	5.9
Nausea	21.9	18.2	20.0	8.8
Vomiting	15.6	12.1	13.8	2.9
Abdominal pain upper	6.2	12.1	9.2	8.8
Abdominal pain	15.6	3.0	9.2	2.9
Dyspepsia	6.2	12.1	9.2	0
Headache	6.2	9.1	7.7	2.9
Oropharyngeal pain	9.4	3.0	6.2	5.9
Cough	9.4	3.0	6.2	2.9
Hyperglycaemia	0	0	0	14.7
Nasopharyngitis	3.1	6.1	4.6	5.9
Decreased appetite	0	12.1	6.2	0
Anxiety	3.1	6.1	4.6	0
Gastroenteritis	0	0	0	5.9
Injection site reaction	0	6.1	3.1	0
Tonsillitis	6.2	0	3.1	0

N=number of patients in treatment group; TZP=tirzepatide

Table 4 Summary of treatment-emergent adverse events with frequency ≥5% in any treatment group in CWM studies SURMOUNT-1 and SURMOUNT-2

Preferred Term	**TZP 5 mg[a] (N=630) %**	**TZP 10 mg (N=948) %**	**TZP 15 mg (N=941) %**	**TZP ALL (N=2519) %**	**Placebo (N=958) %**
Nausea	24.6	29.0	28.0	27.5	8.5
Diarrhoea	18.7	20.8	22.5	20.9	7.8
COVID-19	14.9	15.9	12.2	14.3	14.9
Constipation	16.8	14.1	10.8	13.6	5.2
Vomiting	8.3	10.8	12.5	10.8	2.2
Decreased appetite	9.4	10.9	9.0	9.8	2.9
Dyspepsia	8.9	9.0	9.9	9.3	3.9
Headache	6.5	6.2	6.0	6.2	5.3
Abdominal pain	4.9	4.9	5.7	5.2	2.9
Eructation	3.8	5.5	5.1	4.9	0.6
Alopecia	5.1	4.2	4.9	4.7	0.8
Dizziness	4.1	5.5	3.6	4.5	2.1
Hyperglycaemia	0.2	0.6	0.4	0.4	5.1

N=number of patients in treatment group; TZP=tirzepatide

[a] The TZP 5 mg group is only from SURMOUNT-1

Table 5 Summary of treatment-emergent adverse events with frequency ≥5% in any treatment group in OSA studies

Preferred Term	Placebo (N=234) n (%)	Tirzepatide (N=233) n (%)
Diarrhoea	25 (10.7)	56 (24.0)
Nausea	18 (7.7)	55 (23.6)
Constipation	8 (3.4)	36 (15.5)
Vomiting	6 (2.6)	31 (13.3)
Eructation	1 (0.4)	19 (8.2)
Nasopharyngitis	20 (8.5)	18 (7.7)
Dyspepsia	3 (1.3)	16 (6.9)
Gastroesophageal reflux disease	1 (0.4)	15 (6.4)
COVID-19	21 (9.0)	14 (6.0)
Injection site reaction	1 (0.4)	14 (6.0)
Abdominal pain	6 (2.6)	12 (5.2)
Upper respiratory tract infection	18 (7.7)	12 (5.2)

n = number of participants with at least 1 TEAE
N = number of participants in treatment group

Description of selected adverse reactions

Gastrointestinal adverse reactions

In pooled adult placebo-controlled phase 3 studies, gastrointestinal disorders were dose-dependently increased for tirzepatide 5 mg (37.1%), 10 mg (39.6%) and 15 mg (43.6%) compared with placebo (20.4%). Nausea occurred in 12.2%, 15.4% and 18.3% versus 4.3% and diarrhoea in 11.8%, 13.3% and 16.2% versus 8.9% for tirzepatide 5 mg, 10 mg and 15 mg versus placebo. Gastrointestinal adverse reactions were mostly mild (74%) or moderate (23.3%) in severity. The incidence of nausea, vomiting, and diarrhoea was higher during the dose escalation period and decreased over time.

More subjects in the tirzepatide 5 mg (3.0%), 10 mg (5.4%) and 15 mg (6.6%) groups compared to the placebo group (0.4%) discontinued permanently due to the gastrointestinal event.

Hypoglycaemia

The risk of severe hypoglycaemia with tirzepatide is low. In clinical studies in adult patients, 10 (0.20%) patients reported 12 episodes of severe hypoglycaemia. Of these 10 patients, 5 (0.10%) were on a background of insulin glargine or sulfonylurea who reported 1 episode each.

Clinically significant hypoglycaemia occurred in 10 to 14% (0.14 to 0.16 events/patient year) of patients when tirzepatide was added to sulfonylurea and in 14 to 19% (0.43 to 0.64 events/patient year) of patients when tirzepatide was added to basal insulin.

The rate of clinically significant hypoglycaemia when tirzepatide was used as monotherapy or when added to other oral antidiabetic medication was up to 0.03 events/patient year (see **Table 1** and sections **4.2 Dose and method of administration**, **4.4 Special warnings and precautions for use** and **5.1 Pharmacodynamic properties**).

Children and adolescents aged 10 to less than 18 years with T2DM

No severe hypoglycaemic episodes occurred during the paediatric T2DM trial. During the placebo-controlled phase, clinically significant hypoglycaemia (blood glucose < 3.0 mmol/L) occurred in 28.6% (1.98 events/patient year) of patients treated with tirzepatide and in 10.0% (0.35 events/patient year) of patients treated with placebo, when added to basal insulin with or without metformin. The rate was 9.1% (0.28 events/patient year) and 4.2% (0.07 events/patient year) for tirzepatide- and placebo-treated patients, respectively, when added to metformin alone.

Hypersensitivity reactions

Hypersensitivity reactions have been reported with tirzepatide in the pool of adult placebo-controlled trials, sometimes severe (e.g., urticaria and eczema); hypersensitivity reactions were reported in 3.2 % of tirzepatide-treated patients compared to 1.7 % of placebo-treated patients.

Immunogenicity

There was no evidence that the pharmacokinetic profile and efficacy were impacted by the development of anti-drug antibodies (ADA). More tirzepatide-treated adult patients who developed anti-tirzepatide antibodies experienced hypersensitivity reactions or injection site reactions than those who did not develop these antibodies.

Consistent with the potentially immunogenic properties of protein and peptide medicinal products, patients may develop antibodies following treatment with tirzepatide.

In Phase 3 clinical studies, approximately 51 - 65% of tirzepatide-treated patients developed ADA.

Of the overall tirzepatide-treated patients,

- up to 2.8% and up to 2.7% had neutralising antibodies against tirzepatide activity on the glucose-dependent insulinotropic polypeptide (GIP) and glucagon-like peptide-1 (GLP-1) receptors, respectively.
- up to 0.9% and 0.4% had neutralising antibodies against native GIP and GLP-1, respectively.

Children and adolescents aged 10 to less than 18 years with T2DM

In a Phase 3 clinical study, during the placebo-controlled period, of the tirzepatide-treated children and adolescent patients aged 10 to less than 18 years with T2DM:

- 49.2% developed ADAs.
- none had neutralising antibodies against tirzepatide activity on the GIP and GLP-1 receptors, native GIP, or native GLP-1.

Heart rate

T2DM

Adults

In the pooled placebo-controlled phase 3 studies in adult patients, treatment with tirzepatide resulted in a maximum mean increase in heart rate of 3 to 5 beats per minute (bpm) across doses. The maximum mean increase in heart rate in placebo-treated patients was 1 bpm.

The incidence of patients who had a change of baseline heart rate of >20 bpm for 2 or more consecutive visits was 2.1%, 3.8% and 2.9%, for tirzepatide 5 mg, 10 mg and 15 mg, respectively, compared with 2.1% for placebo.

Small mean increases in PR interval were observed with tirzepatide when compared to placebo (mean increase of 1.4 to 3.2 msec and mean decrease of 1.4 msec respectively). No difference in arrythmia and cardiac conduction disorder treatment emergent events were observed between tirzepatide 5 mg, 10 mg, 15 mg and placebo (3.8%, 2.1%, 3.7% and 3% respectively).

Children and adolescent patients aged 10 to less than 18 years

Changes in heart rate in the clinical trial with children and adolescent patients aged 10 to less than 18 years with T2DM were similar to adults.

CWM and OSA

In the pooled CWM and pooled OSA, placebo-controlled phase 3 studies in adult patients, treatment with tirzepatide resulted in a mean increase in heart rate of 3 bpm. There was a mean increase in heart rate of 0.1 bpm in placebo-treated patients.

Injection site reactions

In the pooled placebo-controlled T2DM phase 3 studies in adult patients, injection site reactions were increased for tirzepatide (3.2%) compared with placebo (0.4%).

Overall, in the phase 3 studies, the most common signs and symptoms of injection site reactions were erythema and pruritus. The maximum severity of injection site reactions for patients was mild (90%) or moderate (10%). No injection site reactions were serious.

Pancreatic enzymes

T2DM

Adults

In the pooled placebo-controlled phase 3 studies in adult patients, treatment with tirzepatide resulted in mean increases from baseline in pancreatic amylase of 33% to 38% and lipase of 31% to 42% across doses. Placebo treated patients had an increase from baseline in amylase of 4% and no changes were observed in lipase.

Children and adolescent patients aged 10 to less than 18 years

Mean increases in pancreatic amylase and lipase in the clinical trial with children and adolescent patients aged 10 to less than 18 years with T2DM were similar to adults.

CWM and OSA

In the placebo-controlled phase 3 studies, treatment with tirzepatide resulted in mean increases from baseline in pancreatic amylase of 23% and lipase of 34%.

POSTMARKETING DATA

The following adverse drug reactions are based on post marketing reports of tirzepatide:

Eye disorders - Events of non-arteritic anterior ischaemic optic neuropathy (NAION), a rare condition associated with the potential for decreased vision including permanent loss of vision, have been reported in patients treated with products with GLP-1 receptor agonist activity. A sudden loss of vision should lead to ophthalmological examination.

Gastrointestinal disorders – Intestinal obstruction including ileus.

Hepatobiliary disorders - Acute gallbladder disease including cholelithiasis, cholecystitis, biliary colic and cholecystectomy: Uncommon

Immune System disorders – Anaphylactic Reaction and Angioedema.

Nervous System disorders – Dysaesthesia: Uncommon (≥0.1% - <1%).

Reporting suspected adverse effects

Reporting suspected adverse reactions after registration of the medicinal product is important. It allows continued monitoring of the benefit-risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions at http://www.tga.gov.au/reporting-problems.

4.9 OVERDOSE

In the event of overdose, appropriate supportive treatments should be initiated according to the patient's clinical signs and symptoms. A period of observation and treatment of these symptoms may be necessary, taking into account the half-life of tirzepatide (approximately 5 days).

For information on the management of overdose, contact the Poisons Information Centre on 13 11 26 (Australia).

5 PHARMACOLOGICAL PROPERTIES

5.1 PHARMACODYNAMIC PROPERTIES

Pharmacotherapeutic group: Drugs used in diabetes, blood glucose lowering drugs, excl. insulins,

ATC code: A10BX16.

Mechanism of action

Tirzepatide is a long-acting GIP and GLP-1 receptor agonist. It is an amino acid sequence with a C20 fatty diacid moiety that enables albumin binding and prolongs half-life. Both receptors are present on the pancreatic α and β endocrine cells, brain, heart, vasculature, immune cells (leukocytes), gut and kidney. GIP receptors are also present on adipocytes.

Tirzepatide is selective to human GIP and GLP-1 receptors. Tirzepatide has high affinity to both the GIP and GLP-1 receptors. The activity of tirzepatide on the GIP receptor is similar to native GIP hormone. The activity of tirzepatide on the GLP-1 receptor is lower compared to native GLP-1 hormone. Tirzepatide is a biased agonist at the GLP-1 receptor with preferential signaling towards the activation of adenylyl cyclase as opposed to the recruitment of β - arrestin.

Pharmacodynamic effects

Glycaemic control

Tirzepatide improves glycaemic control by lowering fasting and postprandial glucose concentrations in patients with T2DM through several mechanisms.

Insulin secretion

Tirzepatide increases β - cell glucose sensitivity. In a hyperglycaemic clamp study in adult patients with T2DM, tirzepatide was compared to placebo and the selective GLP-1 receptor agonist semaglutide 1mg for insulin secretion. Tirzepatide 15 mg enhanced the first- and second-phase insulin secretion rate by 466% and 302% from baseline, respectively, in a glucose dependent manner. There was no change in first- and second-phase insulin secretion rate for placebo and the rates increased for semaglutide 1 mg by 298% and 223%, respectively.

Insulin sensitivity

In adults tirzepatide 15 mg improved whole body insulin sensitivity by 63%, as measured by M-value, a measure of glucose tissue uptake using hyperinsulinemic euglycaemic clamp. The M-value was unchanged for placebo and increased in semaglutide 1 mg by 35%.

Tirzepatide lowers body weight in patients with T2DM, which may contribute to improvement in insulin sensitivity. Reduced food intake with tirzepatide contributes to body weight loss. Body weight reduction is mostly due to reduced fat mass.

Glucagon concentration

Tirzepatide reduced the fasting and postprandial glucagon concentrations. In adults, tirzepatide 15 mg reduced fasting glucagon concentration by 28% and glucagon AUC after a mixed meal by 43%, compared with no change for placebo, and decreases for semaglutide 1mg in fasting glucagon by 22% and in glucagon AUC by 29%.

Gastric emptying

Tirzepatide delays gastric emptying, with largest delay after the first dose and this effect diminishes over time. Slowing post-meal glucose absorption and can lead to a beneficial effect on postprandial glycaemia.

Energy intake

In adult patients with T2DM, tirzepatide reduced food intake contributing to body weight loss. In pre-clinical rodent studies tirzepatide induced a preference to lower fat food.

Appetite Regulation

Tirzepatide regulates appetite and decreases food intake. Both the GIP and GLP-1 receptors are found in areas of the brain that are important for appetite regulation.

Animal studies show that tirzepatide distributes to and activates neurons in brain regions involved in regulation of appetite and food intake.

Body Weight

Tirzepatide reduces and controls body weight. GIP receptors are present on adipocytes. Studies in diet-induced obese mice show that tirzepatide modulates fat utilisation through the GIP receptor.

Clinical trials - Clinical efficacy and safety

T2DM

Adults

Glycaemic control and body weight

The safety and efficacy of tirzepatide were evaluated in five (5) global randomised, controlled, phase 3 studies (SURPASS 1 to 5) assessing glycaemic efficacy as the primary objective involving 6,263 treated patients with T2DM (4,199 treated with tirzepatide). The secondary objectives included body weight, fasting serum glucose (FSG) and proportion of patients reaching target HbA1c. All five phase 3 studies assessed tirzepatide 5 mg, 10 mg and 15 mg. All patients treated with tirzepatide started with 2.5 mg for 4 weeks. Then the dose of tirzepatide was increased by 2.5 mg every 4 weeks until they reached their assigned dose.

Across all studies, treatment with tirzepatide demonstrated sustained, statistically significant and clinically meaningful reductions from baseline in HbA1c and body weight compared to either placebo or active control treatment (semaglutide, insulin degludec and insulin glargine) for up to 1 year. In 1 study these effects were sustained for up to 2 years. Results from the phase 3 studies are presented below based on the modified intent-to-treat (mITT) population consisting of all randomly assigned patients who were exposed to at least 1 dose of study treatment, excluding patients discontinuing study treatment due to inadvertent enrolment. The analysis aligned to the efficacy estimand for a longitudinal continuous variable employed a mixed model for repeated measurements.

SURPASS 1 – Monotherapy

In a 40-week double blind placebo-controlled study (GPGK), 478 patients with inadequate glycaemic control with diet and exercise, were randomised to tirzepatide 5 mg, 10 mg or 15 mg once weekly or placebo. Patients had a mean age of 54 years and 52 % were men. At baseline the patients had a mean duration of diabetes of 5 years and the mean BMI was 32 kg/m^2.

Table 6 SURPASS 1: Results at week 40

		Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide 15 mg	Placebo
m-ITT population (n)		121	121	120	113
HbA_{1c} (%)	Baseline (mean)	7.97	7.88	7.88	8.08
	Change from baseline	-1.87##	-1.89##	-2.07##	+0.04
	Difference from placebo [95% CI]	-1.91** [-2.18, -1.63]	-1.93** [-2.21, -1.65]	-2.11** [-2.39, -1.83]	-
Patients (%) achieving HbA_{1c}	<7%	86.8**	91.5**	87.9**	19.6
	≤6.5%	81.8††	81.4††	86.2††	9.8
	<5.7%	33.9**	30.5**	51.7**	0.9
FSG (mmol/L)	Baseline (mean)	8.5	8.5	8.6	8.6
	Change from baseline	-2.4##	-2.6##	-2.7##	+0.7#
	Difference from placebo [95% CI]	-3.13** [-3.71, -2.56]	-3.26** [-3.84, -2.69]	-3.45** [-4.04, -2.86]	-
Body weight (kg)	Baseline (mean)	87.0	85.7	85.9	84.4
	Change from baseline	-7.0##	-7.8##	-9.5##	-0.7
	Difference from placebo [95% CI]	-6.3** [-7.8, -4.7]	-7.1** [-8.6, -5.5]	-8.8** [-10.3, -7.2]	-
Patients (%) achieving weight loss	≥5%	66.9††	78.0††	76.7††	14.3
	≥10%	30.6††	39.8††	47.4††	0.9
	≥15%	13.2†	17.0†	26.7†	0.0

m-ITT - modified intent to treat population (efficacy estimand)
** $p < 0.001$ for superiority, adjusted for multiplicity.
† $p < 0.05$, †† $p < 0.001$ compared to placebo, not adjusted for multiplicity.
# $p < 0.05$, ## $p < 0.001$ compared to baseline.

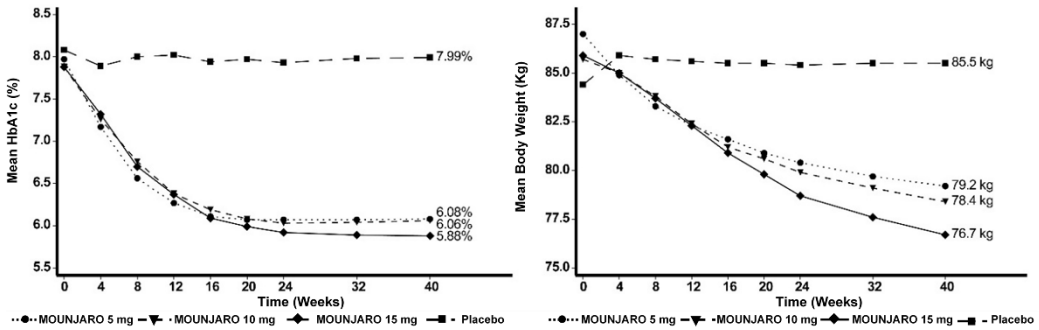


Figure 1 Mean HbA1c (%) from baseline and mean change in body weight (kg) from baseline over time

SURPASS 2 - Combination therapy with metformin

In a 40-week (GPGL) active-controlled open-label study, (double-blind with respect to tirzepatide dose assignment) 1,879 patients were randomised to tirzepatide 5 mg, 10 mg or 15 mg once weekly or semaglutide 1 mg once weekly, all in combination with metformin. Patients had a mean age of 57 years and 47 % were men. At baseline the patients had a mean duration of diabetes of 9 years and the mean BMI was 34 kg/m^2.

Table 7. SURPASS 2: Results at week 40

		Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide 15 mg	Semaglutide 1 mg
m-ITT population (n)		470	469	469	468
HbA_{1c} (%)	Baseline (mean)	8.33	8.31	8.25	8.24
	Change from baseline	-2.09##	-2.37##	-2.46##	-1.86##
	Difference from semaglutide [95% CI]	-0.23** [-0.36, -0.10]	-0.51** [-0.64, -0.38]	-0.60** [-0.73, -0.47]	-
Patients (%) achieving HbA_{1c}	<7%	85.5*	88.9**	92.2**	81.1
	≤6.5%	74.0†	82.1††	87.1††	66.2
	<5.7%	29.3††	44.7**	50.9**	19.7
FSG (mmol/L)	Baseline (mean)	9.67	9.69	9.56	9.49
	Change from baseline	-3.11##	-3.42##	-3.52##	-2.70##
	Difference from semaglutide [95% CI]	- 0.41† [-0.65, -0.16]	- 0.72†† [-0.97, -0.48]	- 0.82†† [-1.06, -0.57]	-
Body weight (kg)	Baseline (mean)	92.6	94.9	93.9	93.8
	Change from baseline	-7.8##	-10.3##	-12.4##	-6.2##
	Difference from semaglutide [95% CI]	-1.7** [-2.6, -0.7]	-4.1** [-5.0, -3.2]	-6.2** [-7.1, -5.3]	-
Patients (% achieving target)	≥5%	68.6†	82.4††	86.2††	58.4
	≥10%	35.8††	52.9††	64.9††	25.3
	≥15%	15.2†	27.7††	39.9††	8.7

m-ITT - modified intent to treat population (efficacy estimand)
* p < 0.05, ** p < 0.001 for superiority, adjusted for multiplicity.
† p < 0.05, †† p < 0.001 compared to semaglutide 1mg, not adjusted for multiplicity.
p < 0.001 compared to baseline.

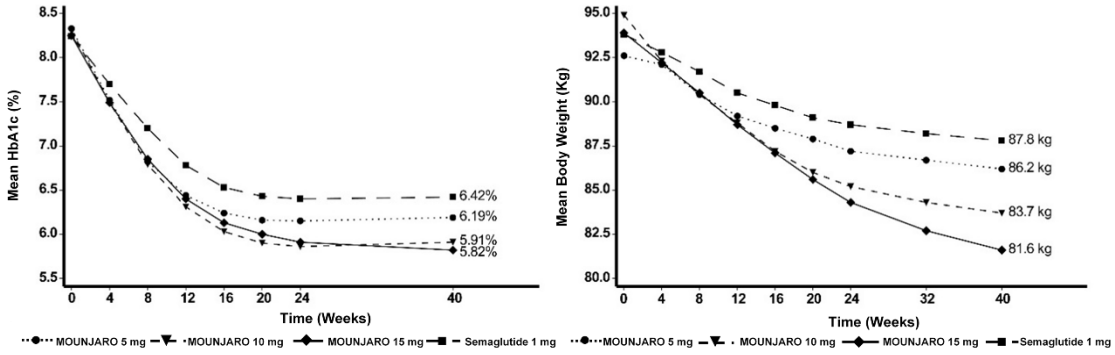


Figure 2 Mean HbA1c (%) from baseline and mean change in body weight (kg) from baseline over time

SURPASS 3 - Combination therapy with metformin, with or without SGLT2i

In a 52-week active-controlled open-label study (GPGH), 1,444 patients were randomised to tirzepatide 5 mg, 10 mg or 15 mg once weekly or insulin degludec, all in combination with metformin and with or without a sodium-glucose co-transporter 2 inhibitor (SGLT2i). 32% of patients were using SGLT2i at baseline. At baseline the patients had a mean duration of diabetes of 8 years, a mean BMI of 34 kg/m^2, a mean age of 57 years and 56 % were men.

Patients treated with insulin degludec started at a dose of 10 U/day which was adjusted using an algorithm for a target fasting blood glucose of < 5 mmol/L. The mean dose of insulin degludec at week 52 was 49 units/day.

Table 8. SURPASS 3: Results at week 52

		Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide 15 mg	Titrated insulin degludec[a]
m-ITT population (n)		358	360	358	359
HbA_{1c} (%)	Baseline (mean)	8.17	8.19	8.21	8.13
	Change from baseline	-1.93##	-2.20##	-2.37##	-1.34##
	Difference from insulin degludec [95% CI]	-0.59** [-0.73, -0.45]	-0.86** [-1.00, 0.72]	-1.04** [-1.17, 0.90]	-
Patients (%) achieving HbA_{1c}	<7%	82.4**	89.7**	92.6**	61.3
	≤6.5%	71.4††	80.3††	85.3††	44.4
	<5.7%	25.8††	38.6††	48.4††	5.4
FSG (mmol/L)	Baseline (mean)	9.54	9.48	9.35	9.24
	Change from baseline	-2.68##	-3.04##	-3.29##	-3.09##
	Difference from insulin degludec [95% CI]	0.41† [0.14, 0.69]	0.05 [-0.24, 0.33]	-0.20 [-0.48, 0.08]	-
Body weight (kg)	Baseline (mean)	94.5	94.3	94.9	94.2
	Change from baseline	-7.5##	-10.7##	-12.9##	+2.3##
	Difference from insulin degludec [95% CI]	-9.8** [-10.8, -8.8]	-13.0** [-14.0, -11.9]	-15.2** [-16.2, -14.2]	-
Patients (%) achieving weight loss	≥5%	66.0††	83.7††	87.8††	6.3
	≥10%	37.4††	55.7††	69.4††	2.9
	≥15%	12.5††	28.3††	42.5††	0.0

m-ITT - modified intent to treat population (efficacy estimand)
[a] The mean dose of insulin degludec at week 52 was 49 units/day.
** p < 0.001 for superiority, adjusted for multiplicity.
†† p < 0.001 compared to insulin degludec, not adjusted for multiplicity.
# p < 0.05, ## p < 0.001 compared to baseline.

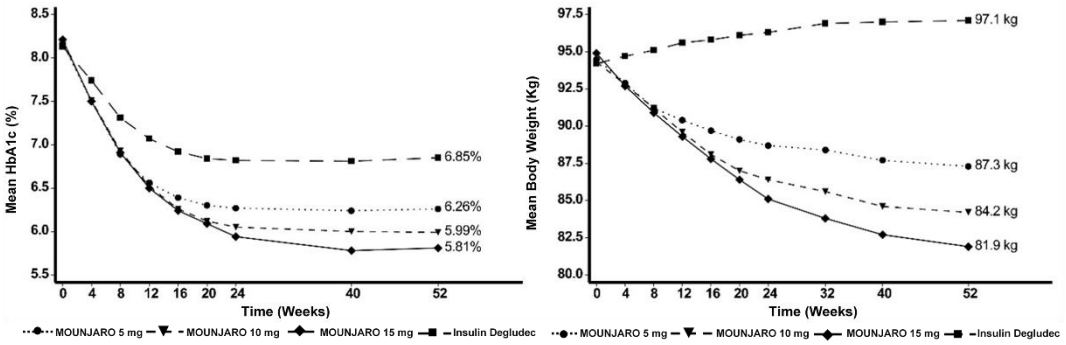


Figure 3 Mean change in HbA1c (%) and body weight (kg) from baseline to week 52

Continuous glucose monitoring (CGM)

A subset of patients (N = 243) participated in an evaluation of the 24-hour glucose profiles captured with blinded CGM. At 52-weeks, patients treated with tirzepatide (10 mg and 15 mg pooled) spent significantly more time with glucose values in the euglycaemic range defined as 3.9 to 7.8 mmol/L compared to patients treated with insulin degludec, with 73% and 48% of the 24-hour period in range, respectively.

At 52-weeks patients in all 3 tirzepatide dose groups spent a greater proportion of the 24-hour period with blood glucose in the range of 3.9 to 10.0 mmol/L than patients treated with insulin degludec: tirzepatide (range), 84.9% to 91.2%; insulin degludec, 75.0%.

Liver fat content (LFC) and adipose tissue

A subset of patients (N = 296) participated in an evaluation of LFC, visceral adipose tissue (VAT) and abdominal subcutaneous adipose tissue (ASAT) assessed through magnetic resonance imaging. At 52-weeks, patients treated with tirzepatide (10 mg and 15 mg pooled) demonstrated statistically significantly greater mean reductions in LFC compared to insulin degludec, -8.09% versus -3.38% respectively, from baselines of 15.67% and 16.58%. Patients treated with tirzepatide 5 mg, 10 mg and 15 mg had significantly greater reductions in volume of VAT (-1.10, -1.53 and -1.65 L respectively) and ASAT (-1.40, -2.25 and -2.05 L respectively) from overall baselines of 6.6 L and 10.4 L respectively at 52 weeks compared with an increase in the insulin degludec group (0.38 and 0.63 L).

SURPASS 4 – Combination therapy with 1-3 oral antidiabetic medicinal products: metformin, sulfonylureas or SGLT2i

In an active-controlled open-label study of up to 104 weeks (primary endpoint at 52 weeks) (GPGM), 2,002 patients with T2DM and increased cardiovascular risk were randomised to tirzepatide 5 mg, 10 mg or 15 mg once weekly or insulin glargine once daily on a background of metformin (95%) and/or sulfonylureas (54%) and/or SGLT-2i (25%). At baseline the patients had a mean duration of diabetes of 12 years, a mean BMI of 33 kg/m^2, a mean age of 64 years and 63% were men. Patients treated with insulin glargine started at a dose of 10 U/day which was adjusted using an algorithm with a fasting blood glucose target of <5.6 mmol/L. The mean dose of insulin glargine at week 52 was 44 units/day.

Table 9. SURPASS 4: Results at week 52

		Tirzepatide 5 mg	**Tirzepatide 10 mg**	**Tirzepatide 15 mg**	**Titrated insulin glargine[a]**
m-ITT population (n)		328	326	337	998
52 weeks					
HbA_{1c} (%)	Baseline (mean)	8.52	8.60	8.52	8.51
	Change from baseline	-2.24##	-2.43##	-2.58##	-1.44##
	Difference from insulin glargine [95% CI]	-0.80** [-0.92, -0.68]	-0.99** [-1.11, -0.87]	-1.14** [-1.26, -1.02]	-
Patients (%) achieving HbA_{1c}	<7%	81.0**	88.2**	90.7**	50.7
	≤6.5%	66.0††	76.0††	81.1††	31.7
	<5.7%	23.0††	32.7††	43.1††	3.4
FSG (mmol/L)	Baseline (mean)	9.57	9.75	9.67	9.37
	Change from baseline	-2.8##	-3.06##	-3.29##	-2.84##
	Difference from insulin glargine [95% CI]	0.04 [-0.22, 0.30]	-0.21 [-0.48, 0.05]	-0.44†† [-0.71, -0.18]	-
Body weight (kg)	Baseline (mean)	90.3	90.7	90.0	90.3
	Change from baseline	-7.1##	-9.5##	-11.7##	+1.9##
	Difference from insulin glargine [95% CI]	-9.0** [-9.8, -8.3]	-11.4** [-12.1, -10.6]	-13.5** [-14.3, -12.8]	-
Patients (%) achieving weight loss	≥5%	62.9††	77.6††	85.3††	8.0
	≥10%	35.9††	53.0††	65.6††	1.5
	≥15%	13.8††	24.0††	36.5††	0.5

m-ITT - modified intent to treat population (efficacy estimand)

[a] The mean dose of insulin glargine at week 52 was 44 units/day.
** p < 0.001 for superiority, adjusted for multiplicity.
†† p < 0.001 compared to insulin glargine, not adjusted for multiplicity.
p < 0.001 compared to baseline.

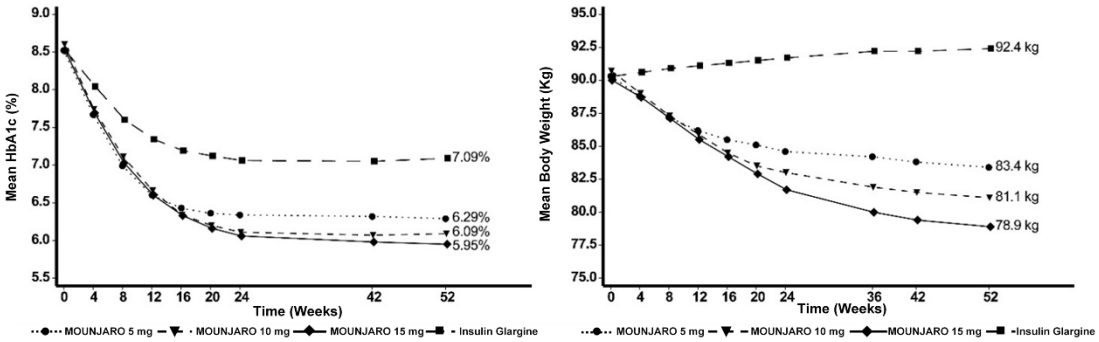


Figure 4 Mean change in HbA1c (%) and body weight (kg) from baseline to week 52

SURPASS 5 - Combination therapy with titrated basal insulin, with or without metformin

In a 40-week double-blind placebo-controlled study (GPGI), 475 patients with inadequate glycaemic control using insulin glargine with or without metformin were randomised to tirzepatide 5 mg, 10 mg or 15 mg once weekly or placebo. Insulin glargine doses were adjusted utilising an algorithm with a fasting blood glucose target of <5.6 mmol/L. At baseline the patients had a mean duration of diabetes of 13 years, a mean BMI of 33 kg/m2, a mean age of 61 years and 56% were men. The overall estimated median dose of insulin glargine at baseline was 34 units/day. The median dose of insulin glargine at week 40 was 38, 36, 29 and 59 units/day for tirzepatide 5 mg, 10 mg, 15 mg and placebo respectively.

Table 10. SURPASS 5: Results at week 40

		Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide 15 mg	Placebo[a]
m-ITT population (n)		116	118	118	119
HbA_{1c} (%)	Baseline (mean)	8.29	8.34	8.22	8.39
	Change from baseline	-2.23##	-2.59##	-2.59##	-0.93##
	Difference from placebo [95% CI]	-1.30** [-1.52, -1.07]	-1.66** [-1.88, -1.43]	-1.65** [-1.88, -1.43]	-
Patients (%) achieving HbA_{1c}	<7%	93.0**	97.4**	94.0**	33.9
	≤6.5%	80.0††	94.7††	92.3††	17.0
	<5.7%	26.1††	47.8††	62.4††	2.5
FSG (mmol/L)	Baseline (mean)	9.00	9.04	8.91	9.13
	Change from baseline	-3.41##	-3.77##	-3.76##	+2.16##
	Difference from placebo [95% CI]	-1.25** [-1.64, -0.86]	-1.61** [-2.00, -1.22]	-1.60** [-1.99, -1.20]	-
Body weight (kg)	Baseline (mean)	95.5	95.4	96.2	94.1
	Change from baseline	-6.2##	-8.2##	-10.9##	+1.7#
	Difference from placebo [95% CI]	-7.8** [-9.4, -6.3]	-9.9** [-11.5, -8.3]	-12.6** [-14.2, -11.0]	-
Patients (%) achieving weight loss	≥5%	53.9††	64.6††	84.6††	5.9
	≥10%	22.6††	46.9††	51.3††	0.9
	≥15%	7.0†	26.6†	31.6††	0.0

m-ITT - modified intent to treat population (efficacy estimand)
[a] The overall median dose of insulin glargine at baseline was 34 units/day. The median dose of insulin glargine at week 40 was 38, 36, 29 and 59 units/day for tirzepatide 5 mg, 10 mg, 15 mg and placebo respectively.
** p < 0.001 for superiority, adjusted for multiplicity.

† p < 0.05, †† p < 0.001 compared to placebo, not adjusted for multiplicity.
# p < 0.05, ## p < 0.001 compared to baseline.

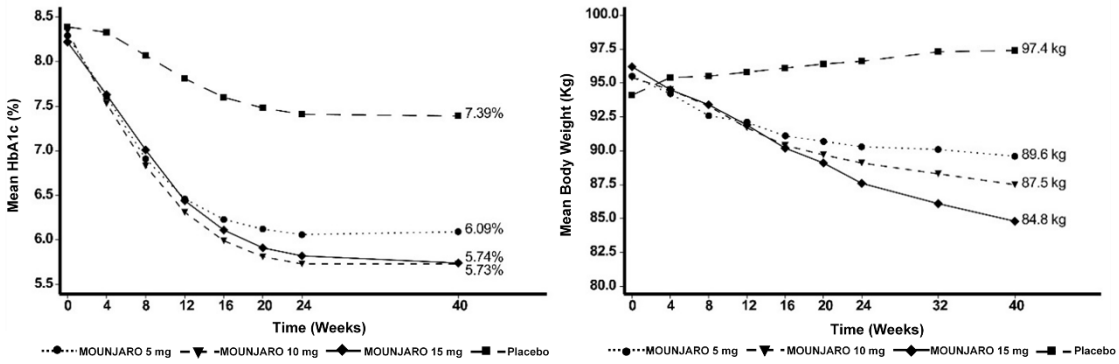


Figure 5 Mean change in HbA1c (%) and body weight (kg) from baseline to week 40

Cardiovascular Evaluation

Cardiovascular (CV) risk was assessed via a meta-analysis of patients with at least one adjudication confirmed major adverse cardiac event (MACE). The composite endpoint of MACE-4 included CV death, nonfatal myocardial infarction, non-fatal stroke, or hospitalisation for unstable angina.

In a primary meta-analysis of phase 2 and 3 registration studies, a total of 116 patients (tirzepatide: 60 [n = 4410]; all comparators: 56 [n = 2169]) experienced at least one adjudication confirmed MACE-4: The results showed that tirzepatide was not associated with excess risk for CV events compared with pooled comparators (HR: 0.81; CI: 0.52 to 1.26).

An additional analysis was conducted specifically for the SURPASS-4 study that enrolled patients with established CV disease. A total of 109 patients (tirzepatide: 47 [n=995]; insulin glargine: 62 [n=1000]) experienced at least one adjudication confirmed MACE-4: The results showed that tirzepatide was not associated with excess risk for CV events compared with insulin glargine (HR: 0.74; CI:0.51 to 1.08).

Blood pressure

In the pooled placebo-controlled T2DM phase 3 studies, treatment across tirzepatide doses resulted in a mean decrease in systolic and diastolic blood pressure of 6 to 9 mmHg and 3 to 4 mmHg, respectively. There was a mean decrease in systolic and diastolic blood pressure of 2 mmHg each in placebo-treated patients.

Other information

Fasting serum glucose

Treatment with tirzepatide resulted in significant reductions from baseline in FSG (changes from baseline to primary end point were -2.4 mmol/L to -3.8 mmol/L). Significant reductions from baseline in FSG could be observed as early as 2 weeks. The improvement in FSG was sustained through the longest study duration of 104 weeks.

Postprandial glucose

Treatment with tirzepatide resulted in significant reductions in mean 2 -hour post prandial glucose (mean of 3 main meals of the day) from baseline (changes from baseline to primary end point were - 3.35 mmol/L to - 4.85 mmol/L).

Pancreatic enzymes

Treatment with tirzepatide resulted in an increase from baseline in pancreatic amylase of 33% to 38% and lipase of 31% to 42%. Placebo-treated patients had an increase from baseline in amylase of 4% and no changes were observed in lipase. In the absence of other signs and symptoms of acute pancreatitis, elevations in pancreatic enzymes alone are not predictive of acute pancreatitis.

Triglycerides

Across SURPASS 1-5 trials, tirzepatide 5 mg, 10 mg and 15 mg resulted in reduction in serum triglyceride of 15 - 19%, 18 - 27% and 21 - 25% respectively.

In the 40-week trial versus semaglutide 1 mg, tirzepatide 5 mg, 10 mg and 15 mg resulted in 19%, 24% and 25% reduction in serum triglycerides levels respectively compared to 12% reduction with semaglutide 1 mg.

Proportion of patients reaching HbA1c <5.7% without clinically significant hypoglycaemia

In the 4 studies where tirzepatide was not combined with basal insulin, 93.6% to 100% of patients who achieved a normal glycaemia of HbA1c <5.7%, at the primary endpoint visit with tirzepatide treatment did so without clinically significant hypoglycaemia. In Study SURPASS-5, 85.9% patients treated with tirzepatide who reached HbA1c <5.7% did so without clinically significant hypoglycaemia.

Children and adolescents aged 10 to less than 18 years

The safety and efficacy of tirzepatide 5 mg and 10 mg once weekly was evaluated in 99 patients aged 10 to below 18 years with T2DM and inadequate glycaemic control on metformin (68.7%) or basal insulin (8.1%), or both (23.2%), in a 30-week double-blind, placebo-controlled phase 3 study, followed by a 22-week open-label extension (SURPASS-PEDS). In the open-label period, all participants on placebo were switched to tirzepatide at a maintenance dose of 5 mg while participants randomised to tirzepatide continued their treatment at the same dose of 5 mg or 10 mg.

All participants were required to have a HbA1c of >6.5% to ≤11%, a body weight ≥50 kg and a BMI greater than the 85th percentile of the general age and gender-matched population for the country.

At baseline, patients had a mean age of 14.7 years and 60.6% were female. Tanner Stage 5 was present in 66.7% of females and 56.4% of males. 57.6% of participants were White and 6.1% were Asian. The mean HbA1c was 8.04%, and the mean duration of T2DM was 2.37 years. The mean BMI was 35.4 kg/m^2 with a mean BMI percentile of 98.6. 91.9% of participants were taking metformin at baseline.

At 30 weeks, tirzepatide 5 mg and 10 mg, both pooled and individually, were superior to placebo in lowering HbA1c. Glycaemic efficacy was sustained through Week 52.

Table 11 SURPASS-PEDS: Results at week 30

		Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide Pooled	Placebo[a]
m-ITT population (n)		32	33	65	34
HbA_{1c} (%)	Baseline (mean)	8.22	7.92	8.07	8.02
	Change from baseline	-2.16##	-2.30##	-2.23##	0.05
	Difference from placebo [95% CI]	-2.21** [-2.89, -1.53]	-2.35** [-3.03, -1.66]	-2.28** [-2.87, -1.69]	-
HbA_{1c} (mmol/mol)	Baseline (mean)	66.3	63.1	64.7	64.2
	Change from baseline	-23.6##	-25.1##	-24.4##	0.53
	Difference from placebo [95% CI]	-24.2** [-31.6, -16.8]	-25.6** [-33.1, -18.2]	-24.9** [-31.4, -18.4]	-
Patients (%) achieving HbA_{1c}	<7%	84.2††	91.5††	87.9††	34.3
	≤6.5%	70.8**	86.1**	78.6**	27.8
	<5.7%	46.9†	59.6††	53.4††	14.4
FSG (mmol/L)	Baseline (mean)	8.25	8.56	8.41	8.51
	Change from baseline	-1.94##	-2.97##	-2.46##	-0.44
	Difference from placebo [95% CI]	-1.50* [-2.71, -0.29]	-2.53** [-3.70, -1.36]	-2.02** [-3.05, -0.98]	-
BMI (kg/m^2)	Baseline (mean)	33.9	37.3	35.6	34.7
	Change (%) from baseline	-7.4##	-11.2##	-9.3##	-0.4
	Difference (%) from placebo [95% CI]	-7.0** [-10.48, -3.60]	-10.8** [-14.25, -7.39]	-8.9** [-11.91, -5.95]	-

m-ITT - modified intent to treat population (efficacy estimand)
* $p < 0.05$, ** $p < 0.001$ for superiority, adjusted for multiplicity.
† $p < 0.01$, †† $p < 0.001$ compared to placebo, not adjusted for multiplicity.
$p < 0.001$ compared to baseline, not adjusted for multiplicity.

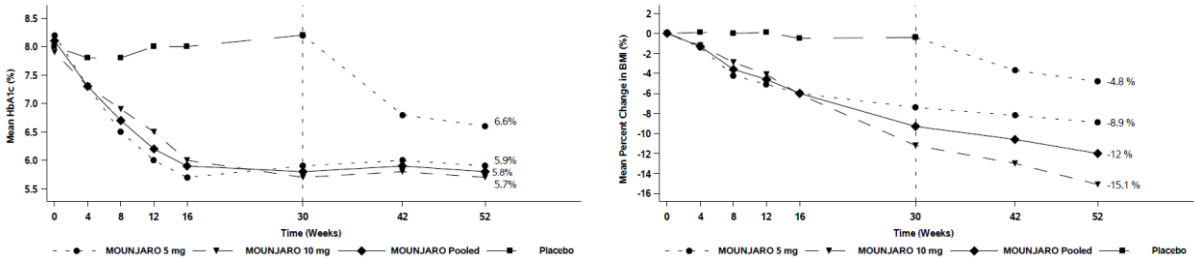


Figure 6 Mean HbA1c (%) and % change in BMI from baseline to week 52

Cardiovascular evaluation

Changes in blood pressure and heart rate in children and adolescents aged 10 to less than 18 years were similar to adults.

Chronic Weight Management (CWM)

The safety and efficacy of tirzepatide for CWM (weight reduction and maintenance) in combination with a reduced calorie intake and increased physical activity were evaluated in three randomised double-blinded, placebo-controlled phase 3 studies in patients with prediabetes or normoglycaemia, but without diabetes mellitus (SURMOUNT-1, SURMOUNT-3 and SURMOUNT-4) and in patients with diabetes mellitus (SURMOUNT-2). The safety and efficacy were also assessed in a randomised, open label, comparator-controlled (semaglutide) phase 3 study in patients without diabetes mellitus (SURMOUNT-5). SURMOUNT-1 included a total of 2539 patients (1896 randomised to treatment with

tirzepatide), while a total of 938 patients (623 randomised to treatment with tirzepatide) were included in SURMOUNT-2. SURMOUNT-3 included a total of 806 participants (579 randomised to treatment), while a total of 783 participants were enrolled in the open-label tirzepatide lead-in period with 670 participants randomised to treatment in the double-blind period in SURMOUNT-4. SURMOUNT-5 included a total of 751 randomised patients (374 on tirzepatide and 376 on semaglutide).

All patients treated with tirzepatide started with 2.5 mg for 4 weeks. Then the dose of tirzepatide was increased by 2.5 mg every 4 weeks until they reached their assigned dose.

In SURMOUNT-1, the dose of tirzepatide or matching placebo was escalated to 5 mg, 10 mg, or 15 mg subcutaneously once weekly during a 20-week period followed by the maintenance period.

In SURMOUNT-2, the dose of tirzepatide or matching placebo was escalated to 10 mg or 15 mg subcutaneously once weekly during a 20-week period followed by the maintenance period.

In SURMOUNT-5, the dose of tirzepatide was escalated to 10 mg or 15 mg subcutaneously once weekly during a 20-week period and the dose of semaglutide was escalated to 1.7 mg or 2.4 mg subcutaneously once weekly during a 16-week period, followed by the maintenance period.

SURMOUNT-1

In a 72-week double blind placebo-controlled study, 2539 adult patients with obesity (BMI ≥30 kg/m^2), or with overweight (BMI ≥27 kg/m^2 to <30 kg/m^2) and at least one weight-related comorbid condition, such as treated or untreated dyslipidaemia, hypertension, obstructive sleep apnoea, or cardiovascular disease, were randomised to tirzepatide 5 mg, 10 mg or 15 mg once weekly or placebo. Patients with T2DM were excluded. Patients had a mean age of 45 years and 67.5% were women. The mean baseline body weight was 104.8 kg and mean BMI was 38 kg/m^2. At baseline 1032 (40.6%) of patients had prediabetes. Prediabetes was defined as fasting glucose of 5.6 to 6.9 mmol/L, 2h glucose of 7.8 to 11.0 mmol/L, or a HbA1c of 5.7% to 6.4% with two abnormal tests needed for diagnosis.

Table 12: SURMOUNT-1: Results at week 72

	Tirzepatide 5 mg	**Tirzepatide 10 mg**	**Tirzepatide 15 mg**	**Placebo**
mITT population (n)	630	636	630	643
Body weight				
Baseline (kg)	102.9	105.9	105.5	104.8
Change (%) from baseline	-16.0†††	-21.4†††	-22.5†††	-2.4†††
Difference (%) from placebo [95 % CI]	-13.5*** [-14.6, -12.5]	-18.9*** [-20.0, -17.8]	-20.1*** [-21.2, -19.0]	-
Change (kg) from baseline	-16.1†††	-22.2†††	-23.6†††	-2.4†††

Difference (kg) from placebo [95 % CI]	-13.8### [-15.0, -12.6]	-19.8### [-21.0, -18.6]	-21.2### [-22.4, -20.0]	-
Patients (%) achieving body weight reduction				
≥ 5 %	89.4***	96.2***	96.3***	27.9
≥ 10 %	73.4###	85.9***	90.1***	13.5
≥ 15 %	50.2###	73.6***	78.2***	6.0
≥ 20 %	31.6###	55.5***	62.9***	1.3
Waist circumference (cm)				
Baseline	113.2	114.9	114.4	114.0
Change from baseline	-14.6†††	-19.4†††	-19.9†††	-3.4†††
Difference from placebo [95 % CI]	-11.2### [-12.3, -10.0]	-16.0*** [-17.2, -14.9]	-16.5*** [-17.7, -15.4]	-

###p-value < 0.001 versus placebo, not adjusted for multiplicity.
***p-value < 0.001 versus placebo, adjusted for multiplicity.
†††p-value <0.001 versus baseline.

In SURMOUNT-1, at 72 weeks, pooled doses of tirzepatide 5 mg, 10 mg and 15 mg led to a significant improvement compared to placebo in systolic blood pressure (-8.1 mmHg vs. -1.3 mmHg), diastolic blood pressure (-5.3 mmHg vs -1.0 mmHg), total cholesterol (-6.1% vs -1.2%), triglycerides (-27.6% vs. -6.3%), non-HDL (-11.4% vs. -1.8%), LDL (-6.8% vs -0.9%), HDL (7.9% vs. 0.2%), and HbA1c (-0.5% vs. -0.1% or -5.1 mmol/mol vs -0.8 mmol/mol).

The subset of patients with prediabetes at baseline (N=1032) continued for up to 176 weeks of treatment to evaluate long-term effects on body weight reduction and delay in onset of adjudication-confirmed T2DM.

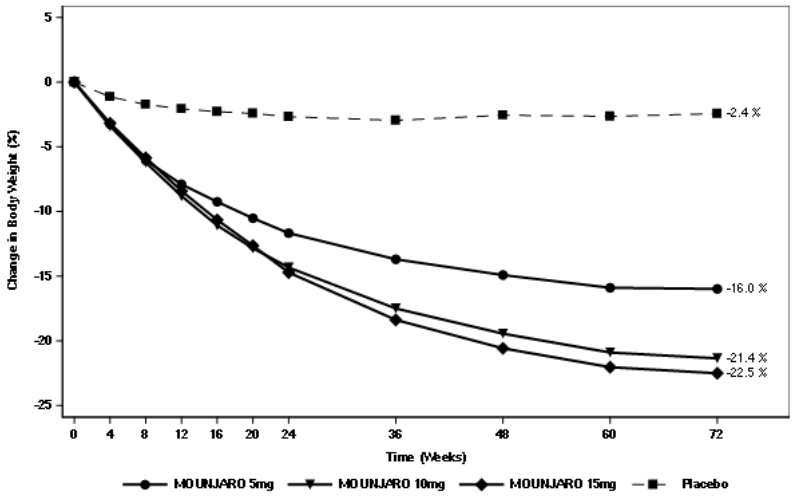


Figure 7 Mean change in body weight (%) from baseline to week 72

Among those with prediabetes at baseline, 95.3% patients treated with tirzepatide reverted to normoglycaemia at week 72, as compared with 61.9% of patients in the placebo group.

Table 13 SURMOUNT-1: Results at week 176 (patients with prediabetes at baseline)

	Tirzepatide 5 mg	Tirzepatide 10 mg	Tirzepatide 15 mg	Placebo
mITT population (n)	247	262	253	270
Body weight				
Baseline (kg)	104.6	108.9	108.5	107.4
Change (%) from baseline	-15.4††	-19.9††	-22.9††	-2.1†
Difference (%) from placebo [95 % CI]	-13.2## [-15.3, -11.1]	-17.7** [-19.8, -15.7]	-20.7** [-22.8, -18.6]	-
Change (kg) from baseline	-15.7††	-21.4††	-24.6††	-2.3†
Difference (kg) from placebo [95 % CI]	-13.4## [-15.9, -11.0]	-19.1## [-21.5, -16.7]	-22.3## [-24.7, -19.9]	-

†p < 0.05, ††p < 0.001 versus baseline.
**p < 0.001 versus placebo, adjusted for multiplicity.
##p < 0.001 versus placebo, not adjusted for multiplicity.

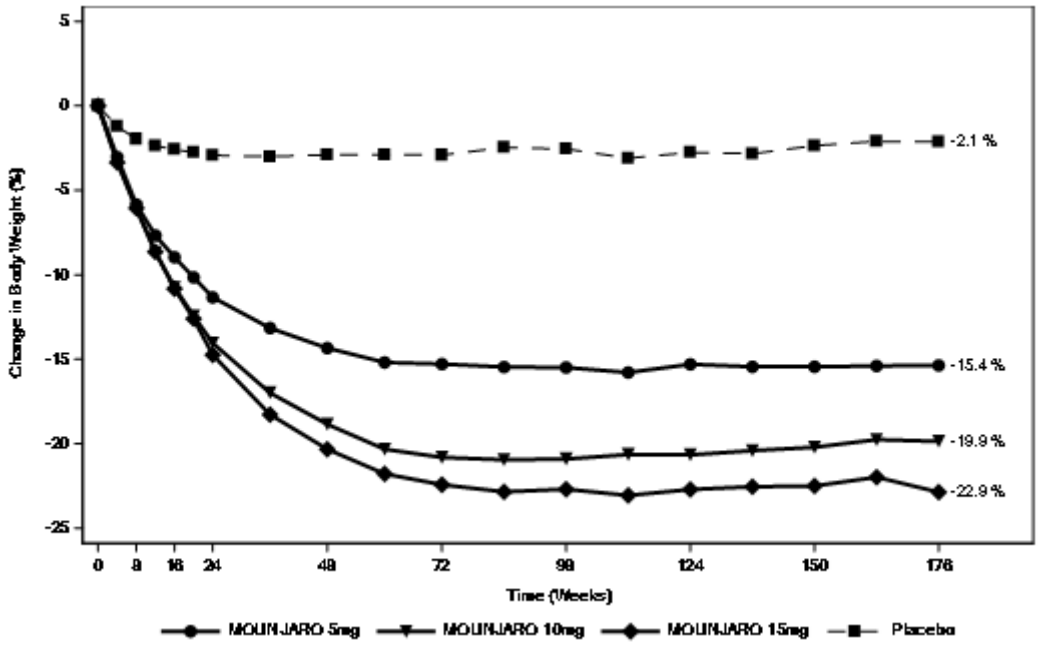


Figure 8 Mean change in body weight (%) from baseline to week 176 (patients with prediabetes at baseline

At the end of 176 weeks, 94.5 % of patients treated with tirzepatide reverted to normoglycaemia, as compared with 60.4 % of patients in the placebo group.9 (1.2%) patients treated with tirzepatide developed T2DM, as compared with 34 (12.6%) patients in the placebo group over 176 weeks.

SURMOUNT-2

In a 72-week double blind placebo-controlled study, 938 adult patients with BMI ≥27 kg/m^2 and T2DM, were randomised to tirzepatide 10 mg or 15 mg once weekly or placebo. Patients

had a mean age of 54 years and 50.7% were women. Mean baseline body weight was 100.7 kg and mean BMI was 36.1 kg/m^2.

Table 14 SURMOUNT-2: Results at week 72

	Tirzepatide 10 mg	**Tirzepatide 15 mg**	**Placebo**
mITT population (n)	312	311	315
Body weight			
Baseline (kg)	101.1	99.5	101.7
Change (%) from baseline	-13.4†††	-15.7†††	-3.3†††
Difference (%) from placebo [95 % CI]	-10.1*** [-11.5, -8.8]	-12.4*** [-13.7, -11.0]	-
Change (kg) from baseline	-13.5†††	-15.6†††	-3.2†††
Difference (kg) from placebo [95 % CI]	-10.3*** [-11.7, -8.8]	-12.4*** [-13.8, -11.0]	-
Patients (%) achieving body weight reduction			
≥ 5 %	81.6***	86.4***	30.6
≥ 10 %	63.4***	69.6***	8.7
≥ 15 %	41.4***	51.8***	2.6
≥ 20 %	23.0***	34.0***	1.0
Waist circumference (cm)			
Baseline	114.3	114.6	116.1
Change from baseline	-11.2†††	-13.8†††	-3.4†††
Difference from placebo [95 % CI]	-7.8*** [-9.2, -6.4]	-10.4*** [-11.8, -8.9]	-

***p-value < 0.001 versus placebo, adjusted for multiplicity.
†††p-value < 0.001 versus baseline.

In SURMOUNT-2, pooled doses of tirzepatide 10 mg and 15 mg led to a significant improvement compared to placebo in systolic blood pressure (-7.2 mmHg vs. -1.0 mmHg), diastolic blood pressure (-2.6 mmHg vs -0.2 mmHg), total cholesterol (-2.6% vs 2.1%), triglycerides (-28.7% vs. -5.8%), non-HDL (-6.7% vs. 2.3%), LDL (2.8% vs 6.3%), HDL (8.3% vs. 1.1%), and HbA1c (-2.2% vs. -0.2% or -23.9 mmol/mol vs -1.8 mmol/mol).

During the trial, treatment was permanently discontinued by 9.3% and 13.8% of patients randomised to tirzepatide 10 mg and 15 mg respectively compared to 14.9% randomised to placebo.

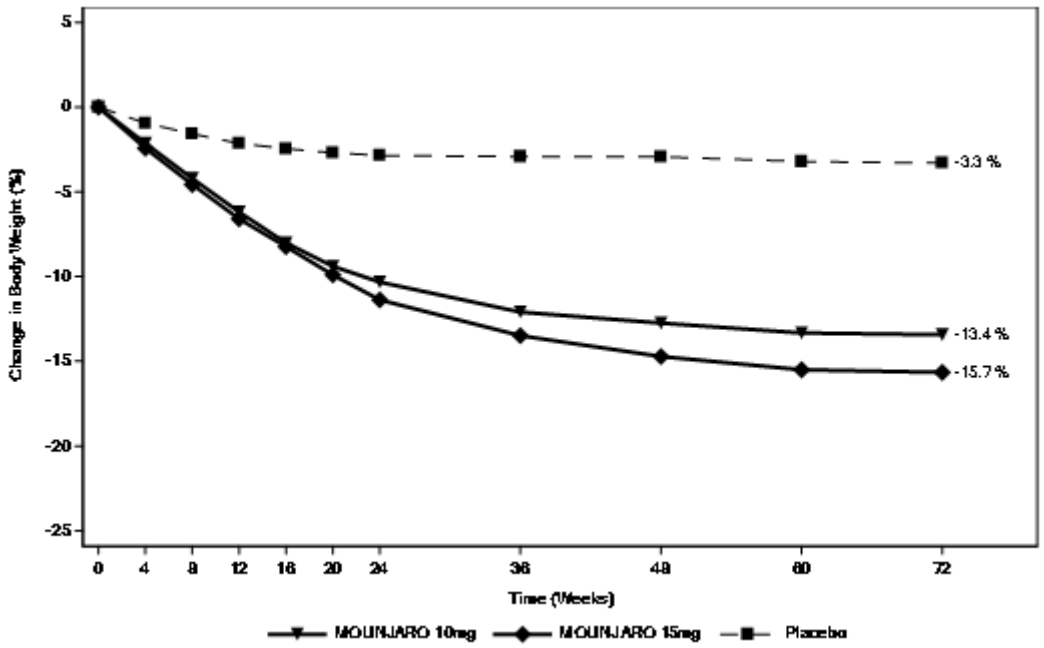


Figure 9 Mean change in body weight (%) from baseline to week 72

SURMOUNT-3

In an 84-week study, 806 adult patients with obesity (BMI ≥30 kg/m^2) or with overweight (BMI ≥27 kg/m^2 to <30 kg/m^2) and at least one weight related comorbid condition, entered a 12-week intensive lifestyle intervention lead-in period consisting of a low-calorie diet (1200-1500 kcal/day), increased physical activity and frequent behavioural counselling. At the end of the 12-week lead-in period, 579 patients who achieved ≥5.0% weight reduction were randomised to tirzepatide maximum tolerated dose (MTD) of 10 mg or 15 mg once weekly or to placebo, for 72 weeks (double-blind phase). Patients were on a reduced-calorie diet and increased physical activity throughout the double-blind phase of the study. At randomisation patients had a mean age of 46 years and 63% were women. Mean BMI at randomisation was 35.9 kg/m^2.

Table 15 SURMOUNT-3: Results at week 72

	Tirzepatide MTD	**Placebo**
mITT population (n)	287	292
Body weight		
Baseline[1] (kg)	102.3	101.3
Change (%) from baseline[1]	-21.1††	3.3††
Difference (%) from placebo [95% CI]	-24.5** [-26.1, -22.8]	-
Change (kg) from baseline[1]	-21.5††	3.5††
Difference (kg) from placebo [95% CI]	-25.0## [-26.9, -23.2]	-
Patients (%) achieving body weight reduction		
≥ 5%	94.4**	10.7
≥ 10%	88.0**	4.8

	Tirzepatide MTD	Placebo
≥ 15%	73.9**	2.1
≥ 20%	54.9**	1.0
Patients (%) who maintain ≥80% of the body weight lost during the 12-week lead-in period	98.6**	37.8
Waist circumference (cm)		
Baseline[1]	109.2	109.6
Change from baseline[1]	-16.8††	1.1
Difference from placebo [95% CI]	-17.9** [-19.5, -16.3]	-

[1]Randomisation (Week 0)
††p < 0.001 versus baseline[1].
**p < 0.001 versus placebo, adjusted for multiplicity.
##p < 0.001 versus placebo, not adjusted for multiplicity.

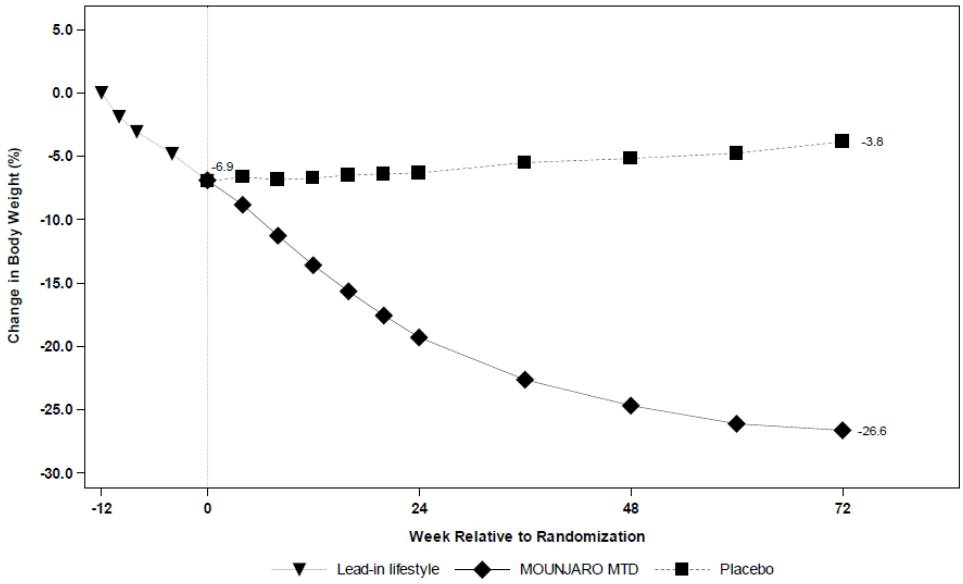


Figure 10 Mean change in body weight (%) from Week -12 to week 72

SURMOUNT-4

In an 88-week study, 783 adult patients with obesity (BMI ≥30 kg/m²) or with overweight (BMI ≥27 kg/m² to <30 kg/m²) and at least one weight related comorbid condition, were enrolled in a 36-week open label tirzepatide lead-in phase. At the start of lead-in period, the enrolled patients had a mean body weight of 107.0 kg and a mean BMI of 38.3 kg/m². At the end of the lead-in period, 670 patients who achieved tirzepatide MTD of 10 mg or 15 mg dose were randomised to continue treatment with tirzepatide once weekly or to switch to placebo for 52 weeks (double-blind phase). Patients were counselled on a reduced calorie diet and increased physical activity throughout the trial. At randomisation (week 36), patients had a mean age of 49 years and 71% were women. Mean body weight at randomisation was 85.2 kg and mean BMI was 30.5 kg/m².

Patients who continued treatment with tirzepatide for an additional 52 weeks (up to 88 weeks in total) maintained and experienced further weigh loss after the initial weight reduction achieved during the 36-week lead-in phase. The weight reduction was superior and clinically meaningful compared to the placebo group, in which a substantial regain of

body weight lost during the lead-in phase was observed (see **Table 15** and **Figure 11**). Nevertheless, the observed mean body weight for placebo-treated patients was lower at week 88 than at the start of the lead-in phase (see **Figure 11**).

Table 16 SURMOUNT-4: Results at week 88

	Tirzepatide MTD	**Placebo**
mITT population (n)	335	335
Body weight		
Weight (kg) at Week 0 (baseline)	106.7	107.8
Weight (kg) at Week 36 (randomisation)	84.5	85.9
Change (%) from Week 36 at Week 88	-6.7††	14.8††
Difference (%) from placebo at Week 88 [95% CI]	-21.4** [-22.9, -20.0]	-
Change (kg) from Week 36 at Week 88	-5.7††	11.9††
Difference (kg) from placebo at Week 88 [95% CI]	-17.6## [-18.8, -16.4]	-
Patients (%) achieving body weight reduction from Week 0 to Week 88		
≥ 5%	98.5**	69.0
≥ 10%	94.0**	44.4
≥ 15%	87.1**	24.0
≥ 20%	72.6**	11.6
Patients (%) who maintain ≥80% of the body weight lost during the 36-week lead-in period at Week 88	93.4**	13.5
Waist circumference (cm)		
Baseline (Week 0)	114.9	115.6
Randomisation (Week 36)	96.7	98.2
Change from randomisation (Week 36)	-4.6††	8.3
Difference from placebo [95% CI]	-12.9** [-14.1, -11.7]	-

††p < 0.001 versus baseline.
**p < 0.001 versus placebo, adjusted for multiplicity.
##p < 0.001 versus placebo, not adjusted for multiplicity.

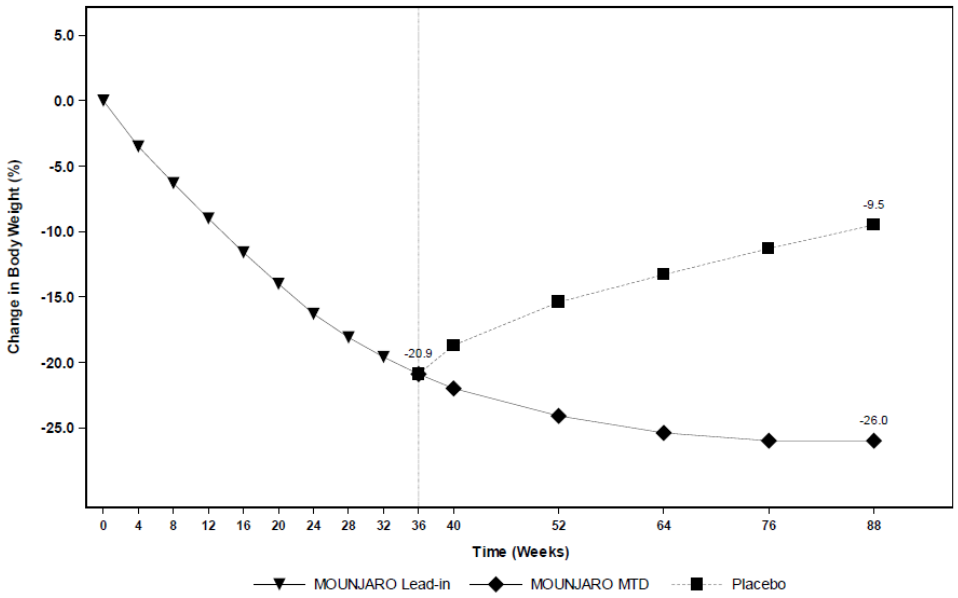


Figure 11 Mean change in body weight (%) from baseline (Week 0) to week 88

Risk of weight regain to >95% of study baseline (Week 0) weight at week 88

Time to event analysis showed that continued tirzepatide treatment during the double-blind period reduced the risk of returning to greater than 95% body weight observed at Week 0, for those who had already lost at least 5% since week 0 by approximately 99% compared with placebo (hazard ratio, 0.013 [95% CI, 0.004 to 0.046]; p < 0.001).

Cardiovascular evaluation

An analysis was conducted for the SURMOUNT-1 study where a total of 14 patients (tirzepatide: 9 (0.47%) out of 1 896; placebo: 5 (0.78%) out of 643) experienced at least one adjudication confirmed MACE. Percentages of patients with adjudication confirmed MACE were similar across placebo and tirzepatide groups.

Analysis was conducted for the SURMOUNT-2 study. A total of 11 patients (tirzepatide: 7 (1.12%) out of 623 placebo: 4 (1.27%) out of 315) experienced at least one adjudication confirmed MACE. Percentages of patients with adjudication confirmed MACE were similar across placebo and tirzepatide groups.

Blood Pressure

In SURMOUNT-1 treatment with tirzepatide resulted in a mean decrease in systolic and diastolic blood pressure of 8.1 mmHg and 5.3 mmHg, respectively. There was a mean decrease in systolic and diastolic blood pressure of 1.3 mmHg and 1.0 mmHg respectively in placebo treated patients.

In SURMOUNT-2 treatment with tirzepatide resulted in a mean decrease in systolic and diastolic blood pressure of 7.2 mmHg and 2.6 mmHg, respectively. There was a mean decrease in systolic and diastolic blood pressure of 1.0 mmHg and 0.2 mmHg respectively in placebo treated patients.

Other information

Changes in body composition

Changes in body composition were evaluated in a sub-study in SURMOUNT-1 using dual energy X-ray absorptiometry (DEXA). The results of the DEXA assessment showed that treatment with tirzepatide was accompanied by greater reduction in fat mass than in lean body mass leading to an improvement in body composition compared to placebo after 72 weeks. Furthermore, this reduction in total fat mass was accompanied by a reduction in visceral fat. These results suggest that most of the total weight loss was attributable to a reduction in fat tissue, including visceral fat.

SURMOUNT-5

In a 72-week study, 751 adult patients with obesity (BMI ≥30 kg/m^2) or overweight (BMI ≥27 kg/m^2 to <30 kg/m^2) with at least 1 weight-related comorbid condition were randomised to maximum tolerated dose of tirzepatide (15 mg or 10 mg once weekly) or semaglutide (2.4 mg or 1.7 mg once weekly). Patients were counselled on a reduced calorie diet and increased physical activity throughout the trial. Participants had a mean age of 44.7 years and a mean BMI of 39.4 kg/m^2. Overall, 64.7% were female.

Treatment with tirzepatide for 72 weeks resulted in superior and clinically meaningful reduction in body weight compared to semaglutide. Tirzepatide achieved superiority compared with semaglutide for the proportion of patients achieving ≥10%, ≥15%, ≥20%, and ≥25% body weight reduction.

Table 17 SURMOUNT-5: Results at week 72

	Tirzepatide 15 mg or MTD	**Semaglutide 2.4 mg or MTD**
mITT population (n)	374	376
Body weight		
Baseline (kg)	112.8	113.6
Change (%) from baseline	-21.6††	-15.4††
Difference (%) from semaglutide [95% CI]	-6.2** [-7.8, -4.6]	-
Change (kg) from baseline	-24.3††	-17.0††
Difference (kg) from semaglutide [95% CI]	-7.3** [-9.2, -5.4]	-
Patients (%) achieving body weight reduction		
≥ 10 %	86.7**	67.3
≥ 15 %	71.2**	46.0
≥ 20 %	54.8**	31.9
≥ 25 %	36.2**	19.4
Waist circumference (cm)		
Baseline	117.8	118.9
Change from baseline	-20.0††	-14.7††
Difference from semaglutide [95% CI]	-5.4** [-7.1, -3.7]	-

m-ITT - modified intent to treat population (efficacy estimand)

††p-value <0.001 versus baseline;
**p-value <0.001 versus semaglutide, adjusted for multiplicity.

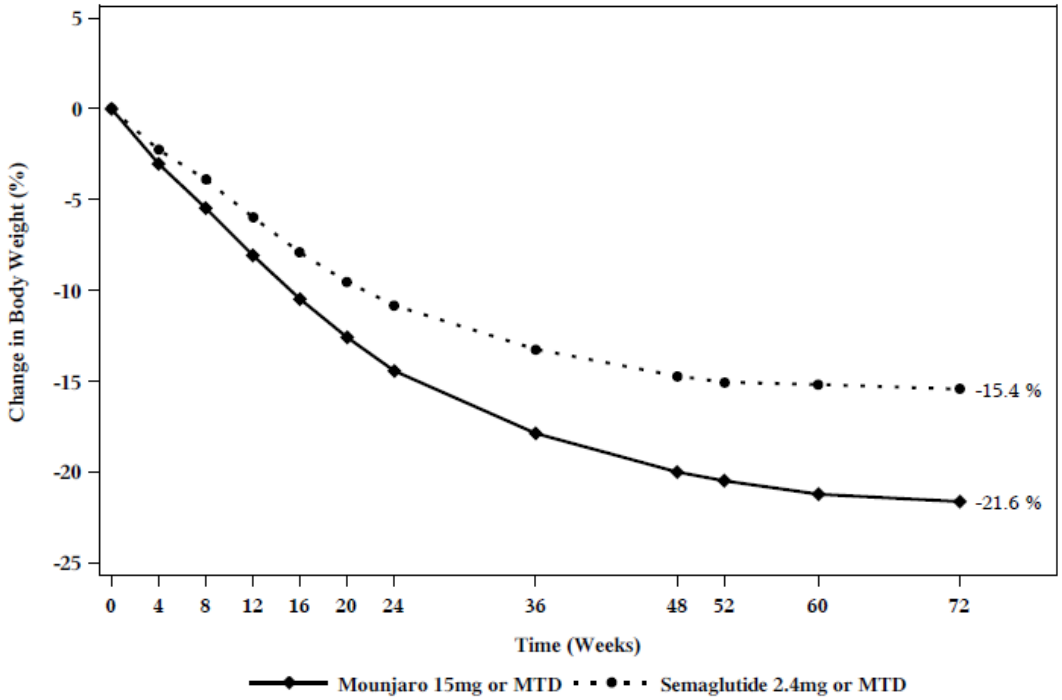


Figure 12 Mean change in body weight (%) from baseline to week 72

Obstructive Sleep Apnoea

The efficacy and safety of tirzepatide for the treatment of moderate to severe obstructive sleep apnoea (OSA), in combination with diet and exercise, in patients with obesity were evaluated in two randomised double-blinded, placebo-controlled phase 3 studies (SURMOUNT-OSA Study 1 and Study 2). A total of 469 adult patients with moderate to severe OSA and obesity (234 randomised to treatment with tirzepatide) were included in these studies. Patients with T2DM were excluded. Study 1 enrolled patients unable or unwilling to use Positive Airway Pressure (PAP) therapy. Study 2 enrolled patients on PAP therapy. All patients were treated with the maximum tolerated dose (MTD; 10 mg or 15 mg) of tirzepatide or placebo, once weekly for 52 weeks.

In both studies, treatment with tirzepatide demonstrated statistically significant and clinically meaningful reduction in the apnoea-hypopnoea index (AHI) compared with placebo. A reduction in AHI was observed with tirzepatide irrespective of age, sex, ethnicity, baseline BMI or baseline OSA severity. Greater proportions of patients treated with tirzepatide achieved remission or mild non-symptomatic OSA compared to placebo (**Table 18**). Among tirzepatide treated patients, greater proportions of patients achieved at least 50% AHI reduction compared to placebo.

SURMOUNT-OSA, Study 1

In a 52-week double-blind placebo-controlled study, 234 adult patients with moderate to severe OSA and obesity, were randomised to tirzepatide MTD of 10 mg or 15 mg once weekly, or to placebo, once weekly. Patients had a mean age of 48 years, 33% were female, 35% had moderate OSA, 63% had severe OSA, 65% had pre-diabetes, 76% had hypertension, 10% had

cardiac disorders, and 81% had dyslipidemia. Patients had a mean Epworth Sleepiness Scale (ESS) of 10.6.

Table 18 SURMOUNT-OSA, Study 1: Results at week 52

	Tirzepatide MTD	Placebo
mITT population (n)	114	120
AHI (events/hr)		
Baseline mean	54.3	50.9
Change from baseline	-27.4††	-4.8†
Difference from placebo [95% CI]	-22.5** [-28.7, -16.4]	-
% Change in AHI		
% Change from baseline	-55.0††	-5.0
% Difference from placebo [95% CI]	-49.9** [-62.8, -37.0]	-
Patients (%) achieving reduction in AHI		
≥50%	62.3	19.2
% Difference from placebo [95% CI]	43.6** [31.1, 56.2]	-
Remission or mild non-symptomatic OSA		
% of Patients with AHI <5 or AHI 5-14 and ESS≤10	43.0	14.9
% Difference from placebo [95% CI]	30.6** [19.8, 41.4]	-
Sleep apnoea-specific hypoxic burden (% min/h)[a]		
Baseline geometric mean	156.6	148.2
% Change from baseline	-67.6††	-13.8
Relative difference from placebo [95% CI]	-62.4** [-70.6, -51.9]	-
Body weight (kg)		
Baseline mean	117.0	112.7
% Change from baseline	-18.1††	-1.3
% Difference from placebo [95% CI]	-16.8** [-18.8, -14.7]	-
Systolic Blood Pressure (mmHg) [b]		
Baseline mean	128.2	130.3
Change from baseline	-9.6††	-1.7
Difference from placebo [95% CI]	-7.9** [-11.0, -4.9]	-
hsCRP (mg/L) [a]		
Baseline geometric mean	3.6	3.8
% Change from baseline	-44.2††	-21.4†
Relative difference from placebo [95% CI]	-28.9* [-43.4, -10.8]	-

† $p < 0.05$, †† $p < 0.001$ versus baseline.

* $p < 0.05$, ** $p < 0.001$ versus placebo, adjusted for multiplicity.

[a] Analysed using log transformed data.

[b] Blood pressure was assessed at Week 48 because PAP withdrawal at Week 52 may confound blood pressure assessment.

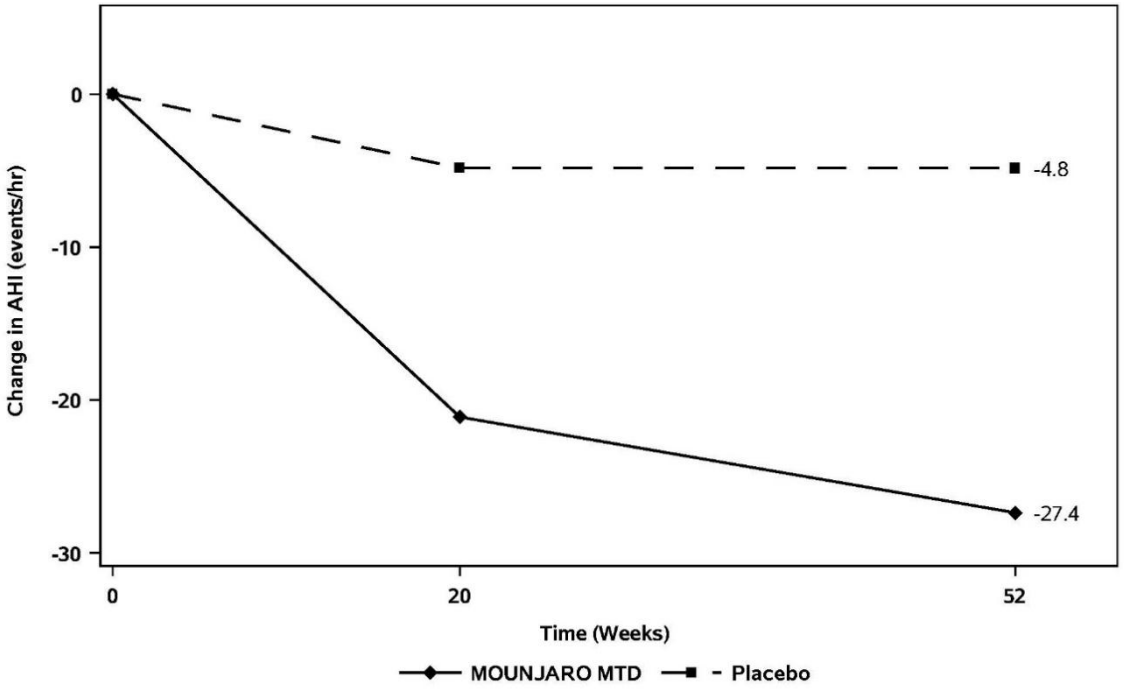


Figure 13 Change from Baseline in Apnoea-Hypopnea Index (AHI) to Week 52 in SURMOUNT-OSA, Study 1

In SURMOUNT-OSA, Study 1, tirzepatide MTD led to a significant improvement compared to placebo in diastolic blood pressure (-5.2 mmHg vs. -2.0 mmHg), triglycerides (-32.9% vs. -1.0%), non-HDL-C (-15.0% vs. -2.3%), HDL-C (10.6% vs. 3.1%), and fasting insulin (-44.2% vs. -4.7%).

SURMOUNT-OSA, Study 2

In a 52-week double-blind placebo-controlled study, 235 adult patients with moderate to severe OSA and obesity, were randomised to tirzepatide MTD of 10 mg or 15 mg once weekly or to placebo, once weekly. Patients had a mean age of 52 years, 28% were female, 31% had moderate OSA, 68% had severe OSA, 65% had pre-diabetes, 77% had hypertension, 11% had cardiac disorders, and 84% had dyslipidemia. Patients had a mean ESS of 10.2.

Table 19 SURMOUNT-OSA, Study 2: Results at week 52

	Tirzepatide MTD	**Placebo**
mITT population (n)	119	114
AHI (events/hr)		
Baseline mean	45.8	53.1
Change from baseline	-30.4††	-6.0†
Difference from placebo [95% CI]	-24.4** [-30.3, -18.6]	-
% Change in AHI		
% Change from baseline	-62.8††	-6.4
% Difference from placebo [95% CI]	-56.4** [-70.7, -42.2]	-
Patients (%) achieving reduction in AHI		
≥50%	74.3	22.9
% Difference from placebo [95% CI]	50.8** [38.6, 62.9]	-

	Tirzepatide MTD	Placebo
Remission or mild non-symptomatic OSA		
% of Patients with AHI <5 or AHI 5-14 and ESS≤10	51.5	13.6
% Difference from placebo [95% CI]	35.1** [23.8, 46.4]	-
Sleep apnoea-specific hypoxic burden (% min/h)[a]		
Baseline geometric mean	129.9	139.1
% Change from baseline	-76.9††	-30.4†
Relative difference from placebo [95% CI]	-66.8** [-76.5, -53.1]	-
Body weight (kg)		
Baseline mean	115.8	115.0
% Change from baseline	-20.1††	-2.3†
% Difference from placebo [95% CI]	-17.8** [-19.9, -15.7]	-
Systolic Blood Pressure (mmHg) [b]		
Baseline mean	130.7	130.5
Change from baseline	-7.6††	-3.3†
Difference from placebo [95% CI]	-4.3* [-7.3, -1.2]	-
hsCRP (mg/L) [a]		
Baseline geometric mean	3.0	2.7
% Change from baseline	-50.7††	-10.4
Relative difference from placebo [95% CI]	-45.1** [-58.8, -26.7]	-

† $p < 0.05$, †† $p < 0.001$ versus baseline.
* $p < 0.05$, ** $p < 0.001$ versus placebo, adjusted for multiplicity.
[a] Analysed using log transformed data.
[b] Blood pressure was assessed at Week 48 because PAP withdrawal at Week 52 may confound blood pressure assessment.

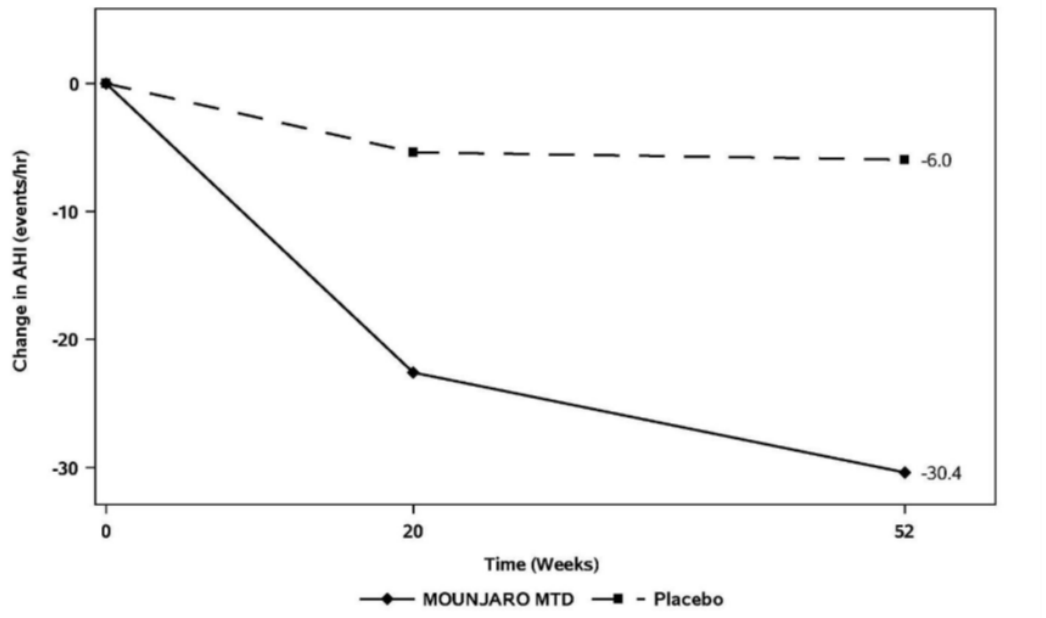


Figure 14 Change from Baseline in Apnoea-Hypopnea Index (AHI) to Week 52 in SURMOUNT-OSA, Study 2

In SURMOUNT-OSA, Study 2, tirzepatide MTD led to a significant improvement compared to placebo in triglycerides (-35.2% vs. -5.4%), non-HDL-C (-15.8% vs. -1.8%), HDL-C (15.0% vs. 4.5%), and fasting insulin (-48.5% vs. -5.6%).

Improvement in sleep-related impairment and sleep disturbance

Tirzepatide-treated patients, pooled across Studies 1 and 2, demonstrated statistically significant improvement in sleep-related impairment and sleep disturbance, as measured by the PROMIS sleep related impairment short form 8a (PROMIS SRI); t-scores (-7.3) versus placebo (-3.5) and PROMIS sleep disturbance short form 8b (PROMIS SD); t-scores (-5.8) versus placebo (-2.9), respectively. This trend was consistent in the individual studies. A significantly greater proportion of patients treated with tirzepatide reported a meaningful within-patient change compared to placebo in PROMIS SRI (Study 1: 44.4% vs 26.6%; Study 2: 39.1% v 23.1%) and PROMIS SD (Study 1: 35.8% vs 24.8%; Study 2: 46.1% vs 27.2%).

Cardiovascular evaluation

In two placebo-controlled OSA phase 3 studies, one patient experienced at least one adjudication confirmed MACE (tirzepatide: 0 (n = 233); placebo: 1 (n = 234)).

Blood pressure

In two placebo-controlled OSA phase 3 studies, treatment with tirzepatide resulted in a mean decrease in systolic and diastolic blood pressure of 9.0 mmHg and 3.8 mmHg, respectively. There was a mean decrease in systolic and diastolic blood pressure of 2.5 mmHg and 1.0 mmHg, respectively, in placebo treated patients.

Other information

Triglycerides

In two placebo-controlled OSA phase 3 studies (Study 1 and Study 2, respectively), treatment with tirzepatide MTD (10 mg or 15 mg) resulted in 32.9% and 35.2% reduction in serum triglyceride levels compared to 1.0% and 5.4% reduction with placebo.

Special populations

In adult patients with T2DM, the efficacy of tirzepatide was not impacted by age, gender, race, ethnicity, region, or by baseline BMI, HbA1c, diabetes duration and level of renal function impairment.

In adult patients who are overweight or with obesity, treatment with tirzepatide produced a statistically significant reduction from baseline in body weight compared to placebo. A reduction in body weight was observed with tirzepatide irrespective of age, sex, race, ethnicity, baseline BMI, and glycaemic status.

The efficacy of tirzepatide for the treatment of moderate to severe OSA in patients with obesity was not impacted by age, sex, ethnicity, baseline BMI, or baseline OSA severity.

5.2 PHARMACOKINETIC PROPERTIES

Absorption

Maximum concentration of tirzepatide is reached 8 to 72 hours post dose. Steady state exposure is achieved following 4 weeks of once weekly administration. Tirzepatide exposure increases in a dose proportional manner. Similar exposure was achieved with subcutaneous administration of tirzepatide in the abdomen, thigh, or upper arm. Absolute bioavailability of subcutaneous tirzepatide was 80%.

Distribution

The mean apparent steady-state volume of distribution of tirzepatide following subcutaneous administration in patients with T2DM is approximately 10.3 L in patients with T2DM and 9.7 L in patients with obesity. Tirzepatide is highly bound to plasma albumin (99%).

Metabolism

Tirzepatide is metabolised by proteolytic cleavage of the peptide backbone, beta-oxidation of the C20 fatty diacid moiety and amide hydrolysis.

Excretion

The apparent population mean clearance of tirzepatide is approximately 0.06 L/h with an elimination half-life of approximately 5 days, enabling once weekly administration.

Tirzepatide is eliminated by metabolism. The primary excretion routes of tirzepatide metabolites are via urine and faeces. Intact tirzepatide is not observed in urine or faeces.

Special populations

Age, gender, race, ethnicity, body weight

Age, gender, race, ethnicity or body weight, do not have a clinically relevant effect on the pharmacokinetics (PK) of tirzepatide.

Renal impairment

Renal impairment does not impact the PK of tirzepatide. The PK of tirzepatide after a single 5 mg dose was evaluated in patients with different degrees of renal impairment (mild, moderate, severe, ESRD) compared with subjects with normal renal function. This was also shown for patients with both T2DM and renal impairment based on data from clinical studies.

Hepatic impairment

Hepatic impairment does not impact the PK of tirzepatide. The PK of tirzepatide after a single 5 mg dose was evaluated in patients with different degrees of hepatic impairment (mild, moderate, severe) compared with subjects with normal hepatic function.

Paediatric population

A population pharmacokinetic analysis was conducted for tirzepatide 5 mg and 10 mg using data from 93 paediatric patients aged 10 to less than 18 years weighing 50 kg or more with type 2 diabetes mellitus. The systemic exposure of tirzepatide in paediatric patients weighing

greater than 70 kg was comparable to exposures observed in adults. However, due to the influence of body weight on tirzepatide clearance and volume of distribution, higher steady-state exposures are predicted for paediatric patients with lower body weights. Predicted exposure in paediatric patients weighing 60 kg or less is approximately 1.5-2-fold higher than in the adult population. Tirzepatide has not been studied in children less than 10 years of age or weighing less than 50 kg.

5.3 PRECLINICAL SAFETY DATA

Genotoxicity

In an *in vivo* genotoxicity study (bone marrow micronucleus assay) there were no significant increase in micronuclei in polychromatic erythrocytes in bone marrow of male rats after single SC administration of up to 3 mg/kg tirzepatide. Based on the weight of evidence, tirzepatide is not considered genotoxic.

Carcinogenicity

A 2-year carcinogenicity study was conducted with tirzepatide in male and female rats at doses of 0.15, 0.50, and 1.5 mg/kg (0.12, 0.36, and 1.02-fold the maximum recommended human dose (MRHD) based on area under the curve (AUC)) administered by subcutaneous injection twice weekly. Tirzepatide caused an increase in thyroid C-cell tumours (adenomas and carcinomas) at all doses compared to controls. The human relevance of these findings is currently unknown.

In a 6-month carcinogenicity study in rasH2 transgenic mice, tirzepatide at doses of 1, 3, and 10 mg/kg (up to 11-fold the MRHD based on AUC) administered by subcutaneous injection twice weekly did not produce increased incidences of thyroid C-cell hyperplasia or neoplasia at any dose.

6 PHARMACEUTICAL PARTICULARS

6.1 LIST OF EXCIPIENTS

Single-dose vial and pre-filled pen (autoinjector):

Sodium chloride
Dibasic sodium phosphate heptahydrate
Hydrochloric acid
Sodium hydroxide
Water for Injections

Multiple-dose pre-filled pen (KwikPen):

Dibasic sodium phosphate heptahydrate
Benzyl Alcohol
Glycerol
Phenol
Sodium chloride
Hydrochloric acid
Sodium hydroxide
Water for injections

6.2 INCOMPATIBILITIES

Not applicable for subcutaneous single-dose product.

In the absence of compatibility studies this medicinal product must not be mixed with other medicinal products.

6.3 SHELF LIFE

In Australia, information on the shelf life can be found on the public summary of the Australian Register of Therapeutic Goods (ARTG). The expiry date can be found on the packaging.

6.4 SPECIAL PRECAUTIONS FOR STORAGE

Single-dose vial and pre-filled pen (autoinjector):

MOUNJARO vials and ready-to-use, single-use, pre-filled pens should be stored at 2°C to 8°C, refrigerated. Do not freeze. Do not shake. Store in original carton to protect from light.

In-use

MOUNJARO may be stored unrefrigerated for up to 21 days at temperatures not above 30°C.

Multiple-dose, pre-filled pen (KwikPen):

MOUNJARO ready-to-use, multiple-dose, pre-filled pens should be stored at 2°C to 8°C, refrigerated. Do not freeze. Do not shake. Protect from light.

In-use

MOUNJARO may be stored unrefrigerated for up to 30 days at temperatures not above 30°C.

6.5 NATURE AND CONTENTS OF CONTAINER

MOUNJARO is available in vials and as ready-to-use pre-filled pens

- **Single-use vial**: the product is contained in a clear glass vial (Type I) with a bromobutyl elastomer stopper.

  Trade packs of 1 vial and starter packs of 1 vial for the 2.5 mg/0.5 mL presentation.

- **Multiple-dose, pre-filled pen (KwikPen)**: the product is contained in a clear glass cartridge (Type I) encased in a disposable multiple-dose pen.

Trade packs of 1 pre-filled pen and starter packs of 1 pre-filled pen for the 2.5 mg presentation.

No needles are included in the pack.

- **Single-use pre-filled pen (autoinjector):** the product is contained in a glass syringe (Type I) encased in a disposable single-dose pen.

  Trade packs of 2 or 4 pre-filled pens, and starter packs of 2 pre-filled pens for the 2.5mg/0.5mL presentation.

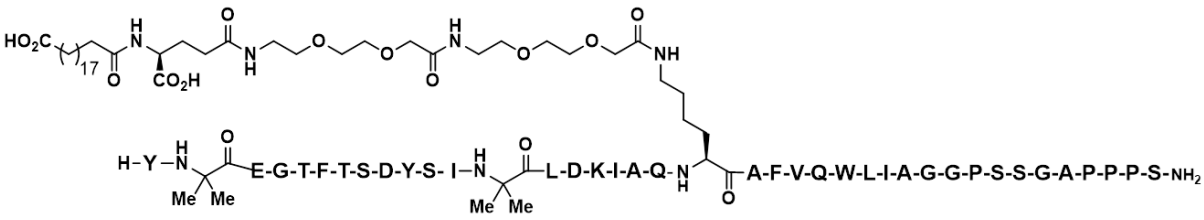
Not all pack sizes and presentations may be available.

6.6 SPECIAL PRECAUTIONS FOR DISPOSAL

In Australia, any unused medicine or waste material should be disposed of by taking to your local pharmacy.

6.7 PHYSICOCHEMICAL PROPERTIES

Chemical structure



Molecular weight:

4,813 Daltons

CAS number

2023788-19-2

7 MEDICINE SCHEDULE (POISONS STANDARD)

S4 – Prescription Medicine

8 SPONSOR

Eli Lilly Australia Pty Ltd

Level 9, 60 Margaret Street, Sydney, NSW 2000

AUSTRALIA

1800 454 559

9 DATE OF FIRST APPROVAL

23 December 2022

10 DATE OF REVISION

02 October 2026

SUMMARY TABLE OF CHANGES

Section Changed	Summary of new information
4 and 5	Addition of paediatric T2DM indication
4.6	Addition of information in 'Use in pregnancy' section
5.1	Addition of clinical trial results for SURMOUNT-1 long term data and SURMOUNT-5

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