

Professional**Single dose 0.5 mg**

Colour: PMS 280C +
PMS 659C +
PMS Cool Gray 6C +
Black

Ozempic®**0.5 mg****Solution for injection in pre-filled pen****Qualitative and quantitative composition**

One ml of solution contains 1.34 mg of semaglutide*. One pre-filled pen contains 2 mg semaglutide* in 1.5 ml solution. Each dose contains 0.5 mg of semaglutide in 0.37 ml solution.

*human glucagon-like peptide-1 (GLP-1) analogue produced in *Saccharomyces cerevisiae* cells by recombinant DNA technology.
For the full list of excipients, see *List of excipients*.

Pharmaceutical form

Solution for injection.

Clear and colourless or almost colourless, isotonic solution; pH=7.4.

Therapeutic indications

Ozempic® 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 considered inappropriate due to intolerance or contraindications
- in addition to other medicinal products for the treatment of diabetes.

Ozempic® is indicated to reduce the risk of major adverse cardiovascular events (cardiovascular death, non-fatal myocardial infarction or non-fatal stroke) in adults with type 2 diabetes mellitus and established cardiovascular disease.

For study results with respect to combinations, effects on glycaemic control and cardiovascular events, and the populations studied, see *Special warnings and precautions for use*, *Interaction with other medicinal products and other forms of interaction* and *Pharmacodynamic properties*.

Posology and method of administration**Posology**

The starting dose is 0.25 mg semaglutide once weekly. After 4 weeks the dose should be increased to 0.5 mg once weekly. After at least 4 weeks with a dose of 0.5 mg once weekly, the dose can be increased to 1 mg once weekly to further improve glycaemic control. Semaglutide 0.25 mg is not a maintenance dose. Weekly doses higher than 1 mg are not recommended.

When Ozempic® is added to existing metformin and/or thiazolidinedione therapy or to a sodium-glucose cotransporter 2 (SGLT2) inhibitor, the current dose of metformin and/or thiazolidinedione or SGLT2 inhibitor can be continued unchanged. When Ozempic® is added to existing therapy of sulfonylurea or insulin, a reduction in the dose of sulfonylurea or insulin should be considered to reduce the risk of hypoglycaemia (see *Special warnings and precautions for use* and *Undesirable effects*).

Self-monitoring of blood glucose is not needed in order to adjust the dose of Ozempic®. Blood glucose self-monitoring is necessary to adjust the dose of sulfonylurea and insulin, particularly when Ozempic® is started and insulin is reduced. A stepwise approach to insulin reduction is recommended.

Missed dose

If a dose is missed, it should be administered as soon as possible and within 5 days after the missed dose. If more than 5 days have passed, the missed dose should be skipped, and the next dose should be administered on the regularly scheduled day. In each case, patients can then resume their regular once weekly dosing schedule.

Special populations**Elderly**

No dose adjustment is required based on age. Therapeutic experience in patients >75 years of age is limited (see *Pharmacokinetic properties*).

Renal impairment

No dose adjustment is required for patients with mild, moderate or severe renal impairment. Experience with the use of semaglutide in patients with severe renal impairment is limited. Semaglutide is not recommended for use in patients with end-stage renal disease (see *Pharmacokinetic properties*).

Hepatic impairment

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

Paediatric population

The safety and efficacy of semaglutide in children and adolescents below 18 years have not yet been established. No data are available.

Method of administration

Ozempic® is to be administered once weekly at any time of the day, with or without meals. Ozempic® is to be injected subcutaneously in the abdomen, in the thigh or in the upper arm. The injection site can be changed without dose adjustment. Ozempic® should not be administered intravenously or intramuscularly.

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). After selecting a new dosing day, once-weekly dosing should be continued.

For further information on administration, see *Special precautions for disposal and other handling*.

Contraindications

Hypersensitivity to the active substance or to any of the excipients listed in *List of excipients*.

Special warnings and precautions for use

Semaglutide should not be used in patients with type 1 diabetes mellitus or for the treatment of diabetic ketoacidosis. Semaglutide is not a substitute for insulin. Diabetic ketoacidosis has been reported in insulin-dependent patients whom had rapid discontinuation or dose reduction of insulin when treatment with a GLP-1 receptor agonist is started (see *Posology and method of administration*).

There is no experience in patients with congestive heart failure NYHA class IV and semaglutide is therefore not recommended in these patients.

Gastrointestinal effects

Use of GLP-1 receptor agonists may be associated with gastrointestinal adverse reactions. This should be considered when treating patients, with impaired renal function as nausea, vomiting, and diarrhoea may cause dehydration which could cause a deterioration of renal function (see *Undesirable effects*).

Acute pancreatitis

Acute pancreatitis has been observed with the use of GLP-1 receptor agonists. Patients should be informed of the characteristic symptoms of acute pancreatitis. If pancreatitis is suspected, semaglutide should be discontinued; if confirmed, semaglutide should not be restarted. Caution should be exercised in patients with a history of pancreatitis.

Hypoglycaemia

Patients treated with semaglutide in combination with a sulfonylurea or insulin may have an increased risk of hypoglycaemia. The risk of hypoglycaemia can be lowered by reducing the dose of sulfonylurea or insulin when initiating treatment with semaglutide (see *Undesirable effects*).

Diabetic retinopathy

In patients with diabetic retinopathy treated with insulin and semaglutide, an increased risk of developing diabetic retinopathy complications has been observed (see *Undesirable effects*). Caution should be exercised when using semaglutide in patients with diabetic retinopathy treated with insulin. These patients should be monitored closely and treated according to clinical guidelines. Rapid improvement in glucose control has been associated with a temporary worsening of diabetic retinopathy, but other mechanisms cannot be excluded.

Sodium content

This medicine contains less than 1 mmol sodium (23 mg) per dose, i.e. essentially 'sodium-free'.

Traceability

In order to improve the traceability of biological medicinal products, the name and the batch number of the administered product should be clearly recorded.

Interaction with other medicinal products and other forms of interaction

Semaglutide delays gastric emptying and has the potential to impact the rate of absorption of concomitantly administered oral medicinal products. Semaglutide should be used with caution in patients receiving oral medicinal products that require rapid gastrointestinal absorption.

Paracetamol

Semaglutide delays the rate of gastric emptying as assessed by paracetamol pharmacokinetics during a standardised meal test. Paracetamol AUC_{0-8h} and C_{max} were decreased by 27% and 23%, respectively, following concomitant use of semaglutide 1 mg. The total paracetamol exposure (AUC_{0-8h}) was not affected. No dose adjustment of paracetamol is necessary when administered with semaglutide.

Oral contraceptives

Semaglutide is not anticipated to decrease the effect of oral contraceptives as semaglutide did not change the overall exposure of ethinylestradiol and levonorgestrel to a clinically relevant degree when an oral contraceptive combination medicinal product (0.03 mg ethinylestradiol/0.15 mg levonorgestrel) was co-administered with semaglutide. Exposure of ethinylestradiol was not affected; an increase of 20% was observed for levonorgestrel exposure at steady state. C_{min} was not affected for any of the compounds.

Atorvastatin

Semaglutide did not change the overall exposure of atorvastatin following a single dose administration of atorvastatin (40 mg). Atorvastatin C_{max} was decreased by 38%. This was assessed not to be clinically relevant.

Digoxin

Semaglutide did not change the overall exposure or C_{min} of digoxin following a single dose of digoxin (0.5 mg).

Metformin

Semaglutide did not change the overall exposure or C_{max} of metformin following dosing of 500 mg twice daily over 3.5 days.

Warfarin

Semaglutide did not change the overall exposure or C_{max} of R- and S-warfarin following a single dose of warfarin (25 mg), and the pharmacodynamic effects of warfarin as measured by the international normalised ratio (INR) were not affected in a clinically relevant manner. However, upon initiation of semaglutide treatment in patients on warfarin or other coumarin derivatives, frequent monitoring of INR is recommended.

Fertility, pregnancy and lactation**Women of childbearing potential**

Women of childbearing potential are recommended to use contraception when treated with semaglutide.

Pregnancy

Studies in animals have shown reproductive toxicity (see *Preclinical safety data*). There are limited data from the use of semaglutide in pregnant women. Therefore, semaglutide should not be used during pregnancy. If a patient wishes to become pregnant, or pregnancy occurs, semaglutide should be discontinued. Semaglutide should be discontinued at least 2 months before a planned pregnancy due to the long half-life (see *Pharmacokinetic properties*).

Breast-feeding

In lactating rats, semaglutide was excreted in milk. As a risk to a breast-fed child cannot be excluded, semaglutide should not be used during breast-feeding.

Fertility

The effect of semaglutide on fertility in humans is unknown. Semaglutide did not affect male fertility in rats. In female rats, an increase in oestrous length and a small

reduction in number of ovolutions were observed at doses associated with maternal body weight loss (see *Preclinical safety data*).

Effects on ability to drive and use machines

Semaglutide has no or negligible influence on the ability to drive or use machines. When it 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 *Special warnings and precautions for use*).

Undesirable effects**Summary of safety profile**

In 8 phase 3a trials 4,792 patients were exposed to semaglutide. The most frequently reported adverse reactions in clinical trials were gastrointestinal disorders, including nausea (very common), diarrhoea (very common) and vomiting (common). In general, these reactions were mild or moderate in severity and of short duration.

Tabulated list of adverse reactions

Table 1 lists adverse reactions identified in all phase 3a trials in patients with type 2 diabetes mellitus (further described in *Pharmacodynamic properties*). The frequencies of the adverse reactions are based on a pool of the phase 3a trials excluding the cardiovascular outcomes trial (see text below the table for additional details).

The reactions are listed below by system organ class and absolute frequency. Within each frequency grouping, adverse reactions are presented in order of decreasing seriousness.

Table 1 Adverse reactions from long-term controlled phase 3a trials including the cardiovascular outcomes trial

MedDRA system organ class	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)	Not known (cannot be estimated from available data)
Immune system disorders			Hypersensitivity	Anaphylactic reaction	
Metabolism and nutrition disorders	Hypoglycaemia* when used with insulin or sulfonylurea	Hypoglycaemia* with other OADs Decreased appetite			
Nervous system disorders		Dizziness	Dysgeusia		
Eye disorders		Diabetic retinopathy complications ^a			
Cardiac disorders			Increased heart rate		
Gastrointestinal disorders	Nausea Diarrhoea	Vomiting Abdominal pain Abnormal flatulence Constipation Dyspepsia Gastritis Gastro-oesophageal reflux disease Eruclation Flatulence Cholelithiasis	Acute pancreatitis		
Hepatobiliary disorders					
Skin and subcutaneous tissue disorders					Angioedema ^d
General disorders and administration site conditions		Fatigue	Injection site reactions		
Investigations		Increased lipase Increased amylase Weight increase			

* Hypoglycaemia defined as severe (requiring the assistance of another person) or symptomatic in combination with a blood glucose <= 1 mmol/l

^a Diabetic retinopathy complications is a composite of: retinal photocoagulation, treatment with intravitreal agents, vitreous haemorrhage, diabetes-related blindness (uncommon). Frequency based on cardiovascular outcomes trial.

^b Grouped term covering also adverse events related to hypersensitivity such as rash and urticaria.

^c From post-marketing reports.

2-year cardiovascular outcomes and safety trial

In cardiovascular high risk population the adverse reaction profile was similar to that seen in the other phase 3a trials (described in *Pharmacodynamic properties*).

Description of selected adverse reactions**Hypoglycaemia**

No episodes of severe hypoglycaemia were observed when semaglutide was used as monotherapy. Severe hypoglycaemia was primarily observed when semaglutide was used with a sulfonylurea (1.2% of subjects, 0.03 events/patient year) or insulin (1.5% of subjects, 0.02 events/patient year). Few episodes (0.1% of subjects, 0.001 events/patient year) were observed with semaglutide in combination with oral antidiabetics other than sulfonylureas.

ADA classified hypoglycaemia occurred in 11.3% (0.3 events/patient year) of patients when semaglutide 1.0 mg was added to SGLT2 inhibitor in SUSTAIN 9 compared to 2.0% (0.04 events/patient year) of placebo-treated patients. Severe hypoglycaemia was reported in 0.7% (0.01 events/patient year) and 0% of patients, respectively.

Gastrointestinal adverse reactions

Nausea occurred in 17.0% and 19.9% of patients when treated with semaglutide 0.5 mg and 1 mg, respectively, diarrhoea in 12.2% and 13.3% and vomiting in 6.4% and 8.4%. Most events were mild to moderate in severity and of short duration. The events led to treatment discontinuation in 3.9% and 5% of patients. The events were most frequently reported during the first months on treatment.

Patients with low body weight may experience more gastrointestinal side effects when treated with semaglutide.

In concomitant use with an SGLT2 inhibitor in SUSTAIN 9, constipation and gastro-oesophageal reflux disease occurred in 6.7% and 4% respectively of patients treated with semaglutide 1.0 mg compared to no events for placebo-treated patients. The prevalence of these events did not decrease over time.

Acute pancreatitis

The frequency of adjudication-confirmed acute pancreatitis reported in phase 3a clinical trials was 0.3% for semaglutide and 0.2% for the comparator, respectively. In the 2-year cardiovascular outcomes trial the frequency of acute pancreatitis confirmed by adjudication was 0.5% for semaglutide and 0.6% for placebo (see *Special warnings and precautions for use*).

Diabetic retinopathy complications

A 2-year clinical trial investigated 3,297 patients with type 2 diabetes, with high cardiovascular risk, long duration of diabetes and poorly controlled blood glucose. In this trial, adjudicated events of diabetic retinopathy complications occurred in more patients treated with semaglutide (3.0% compared to placebo 1.8%). This was observed in insulin-treated patients with known diabetic retinopathy. The treatment difference appeared early and persisted throughout the trial. Systematic evaluation of diabetic retinopathy complication was only performed in the cardiovascular outcomes trial. In clinical trials up to 1 year involving 4,807 patients with type 2 diabetes, adverse events related to diabetic retinopathy were reported in similar proportions of subjects treated with semaglutide (1.7%) and comparators (2.0%).

Discontinuation due to an adverse event

The incidence of discontinuation of treatment due to adverse events was 6.1% and 8.7% for patients treated with semaglutide 0.5 mg and 1 mg, respectively, vs. 1.5% for placebo. The most frequent adverse events leading to discontinuation were gastrointestinal.

Injection site reactions

Injection site reactions (e.g. injection site rash, erythema) have been reported by 0.6% and 0.5% of patients receiving semaglutide 0.5 mg and 1 mg, respectively. These reactions have usually been mild.

Immunogenicity

Consistent with the potentially immunogenic properties of medicinal products containing proteins or peptides, patients may develop antibodies following treatment with semaglutide. The proportion of patients tested positive for anti-semaglutide antibodies at any time point post-baseline was low (1.2%) and no patients had anti-semaglutide neutralising antibodies or anti-semaglutide antibodies with endogenous GLP-1 neutralising effect at end-of-trial.

Heart rate increase

Increased heart rate has been observed with GLP-1 receptor agonists. In the phase 3a trials, mean increases of 1 to 6 beats per minute (bpm) from a baseline of 72 to 76 bpm were observed in subjects treated with Ozempic®. In a long-term trial in subjects with cardiovascular risk factors, 16% of Ozempic®-treated subjects had an increase in heart rate of >10 bpm compared to 11% of subjects on placebo after 2 years of treatment.

Overdose

Overdoses of up to 4 mg in a single dose, and up to 4 mg in a week have been reported in clinical trials. The most commonly reported adverse reaction was nausea. All patients recovered without complications.

There is no specific antidote for overdose with semaglutide. In the event of overdose, appropriate supportive treatment should be initiated according to the patient's clinical signs and symptoms. A prolonged period of observation and treatment for these symptoms may be necessary, taking into account the long half-life of semaglutide of approximately 1 week (see *Pharmacokinetic properties*).

Pharmacodynamic properties

Pharmacotherapeutic group: Drugs used in diabetes, Glucagon-like peptide-1 (GLP-1) analogues, ATC code: A10BJ06

Mechanism of action

Semaglutide is a GLP-1 analogue with 94% sequence homology to human GLP-1. Semaglutide acts as a GLP-1 receptor agonist that selectively binds to and activates the GLP-1 receptor, the target for native GLP-1.

GLP-1 is a physiological hormone that has multiple actions in glucose and appetite regulation, and in the cardiovascular system. The glucose and appetite effects are specifically mediated via GLP-1 receptors in the pancreas and the brain.

Semaglutide reduces blood glucose in a glucose dependent manner by stimulating insulin secretion and lowering glucagon secretion when blood glucose is high. The mechanism of blood glucose lowering also involves a minor delay in gastric emptying in the early postprandial phase. During hypoglycaemia, semaglutide diminishes insulin secretion and does not impair glucagon secretion.

Semaglutide reduces body weight and body fat mass through lowered energy intake, involving an overall reduced appetite. In addition, semaglutide reduces the preference for high fat foods.

GLP-1 receptors are also expressed in the heart, vasculature, immune system and kidneys. Semaglutide had a beneficial effect on plasma lipids, lowered systolic blood pressure and reduced inflammation in clinical studies. In animal studies, semaglutide attenuates the development of atherosclerosis by preventing aortic plaque progression and reducing inflammation in the plaque.

Pharmacodynamic effects

All pharmacodynamic evaluations were performed after 12 weeks of treatment (including dose escalation) at steady state with semaglutide 1 mg once weekly.

Fasting and postprandial glucose

Semaglutide reduces fasting and postprandial glucose concentrations. In patients with type 2 diabetes, treatment with semaglutide 1 mg resulted in reductions in glucose in terms of absolute change from baseline (mmol/l) and relative reduction compared to placebo (%) for fasting glucose (1.6 mmol/l; 22% reduction), 2 hour postprandial glucose (4.1 mmol/l; 37% reduction), mean 24 hour glucose concentration (1.7 mmol/l; 22% reduction) and postprandial glucose excursions over 3 meals (0.6–1.1 mmol/l) compared with placebo. Semaglutide lowered fasting glucose after the first dose.

Beta-cell function and insulin secretion

Semaglutide improves beta-cell function. Compared to placebo, semaglutide improved first- and second-phase insulin response with a 3- and 2-fold increase, respectively, and increased maximal beta-cell secretory capacity in patients with type 2 diabetes. In addition, semaglutide treatment increased fasting insulin concentration compared to placebo.

Glucagon secretion

Semaglutide lowers the fasting and postprandial glucagon concentrations. In patients with type 2 diabetes, semaglutide resulted in the following relative reductions in glucagon compared to placebo: fasting glucagon (8–21%), postprandial glucagon response (14–15%) and mean 24 hour glucagon concentration (12%).

Glucose dependent insulin and glucagon secretion

Semaglutide lowered high blood glucose concentrations by stimulating insulin secretion and lowering glucagon secretion in a glucose dependent manner. With semaglutide, the insulin secretion rate in patients with type 2 diabetes was comparable to that of healthy subjects.

During induced hypoglycaemia, semaglutide compared to placebo did not alter the counter regulatory responses of increased glucagon and did not impair the decrease of C-peptide in patients with type 2 diabetes.

Gastric emptying

Semaglutide caused a minor delay of early postprandial gastric emptying, thereby reducing the rate at which glucose appears in the circulation postprandially.

Appetite, energy intake and food choice

Semaglutide compared to placebo lowered the energy intake of 3 consecutive *ad libitum* meals by 18–35%. This was supported by a semaglutide-induced suppression of appetite in the fasting state as well as postprandially, improved control of eating, less food cravings and a relative lower preference for high fat food.

Fasting and postprandial lipids

Semaglutide compared to placebo lowered fasting triglyceride and very low density lipoproteins (VLDL) cholesterol concentrations by 12% and 21%, respectively. The postprandial triglyceride and VLDL cholesterol response to a high fat meal was reduced by >40%.

Cardiac electrophysiology (QTc)

The effect of semaglutide on cardiac repolarization was tested in a thorough QTc trial. Semaglutide did not prolong QTc intervals at supra-therapeutic dose levels (up to 1.5 mg once weekly rate).

Clinical efficacy and safety

Both improvement of glycaemic control and reduction of cardiovascular morbidity and mortality are an integral part of the treatment of type 2 diabetes.

The efficacy and safety of Ozempic® 0.5 mg and 1 mg once weekly were evaluated in six randomised controlled phase 3a trials that included 7,215 patients with type 2 diabetes mellitus (4,107 treated with semaglutide). Five trials (SUSTAIN 1–5) had the glycaemic efficacy assessment as the primary objective, while one trial (SUSTAIN 6) had cardiovascular outcome as the primary objective.

In addition to phase 3a trials (SUSTAIN 7) including 1,201 patients with type 2 diabetes mellitus (4,107 treated with semaglutide), patients were conducted to compare the efficacy and safety of Ozempic® 0.5 mg and 1 mg once weekly to dulaglutide 0.75 mg and 1.5 mg once weekly, respectively. A phase 3b trial (SUSTAIN 8) was conducted to investigate the efficacy and safety of semaglutide as add-on to SGLT2 inhibitor treatment.

Treatment with semaglutide demonstrated sustained, statistically superior and clinically meaningful reductions in HbA_{1c} and body weight for up to 2 years compared to placebo and active control treatment (sitagliptin, insulin glargine, exenatide ER and dulaglutide).

The efficacy of semaglutide was not impacted by age, gender, race, ethnicity, BMI at baseline, body weight (kg) at baseline, diabetes duration and level of renal function impairment.

Detailed information is provided below.

SUSTAIN 1 – Monotherapy

In a 30-week double-blind placebo-controlled trial, 388 patients inadequately controlled with diet and exercise, were randomised to Ozempic® 0.5 mg or Ozempic® 1 mg once weekly or placebo.

Table 2 SUSTAIN 1: Results at week 30

	Semaglutide 0.5 mg	Semaglutide 1 mg	Placebo
Intent-to-Treat (ITT) Population (N)	128	130	129
HbA_{1c} (%)			
Baseline (mean)	8.1	8.1	8.0
Change from baseline at week 30	-1.5	-1.6	-0
Difference from placebo [95% CI]	-1.4 [-1.7, -1.1]*	-1.5 [-1.8, -1.2]*	-
Patients (%) achieving HbA_{1c} <7% </			

SUSTAIN 9 – Ozempic® vs. placebo as add-on to SGLT2 inhibitor ± metformin or SU
In a 30-week double-blind placebo-controlled trial, 302 patients inadequately controlled with SGLT2 inhibitor with or without metformin or SU were randomised to semaglutide 1.0 mg once weekly or placebo.

Table 8 SUSTAIN 9: Results at week 30

	Semaglutide 1 mg	Placebo
Intent-to-Treat (ITT) Population (N)	151	151
HbA_{1c} (%)		
Baseline (mean)	8.0	8.1
Change from baseline at week 30	-1.5	-0.1
Difference from placebo [95% CI]	-1.4 [-1.6, -1.2]	-
Patients (%) achieving HbA_{1c} <7%	78.7	18.7
PGP (mmol/l)		
Baseline (mean)	9.1	8.9
Change from baseline at week 30	-2.2	0.0
Body weight (kg)		
Baseline (mean)	89.6	93.8
Change from baseline at week 30	-4.7	-0.9
Difference from placebo [95% CI]	-3.8 [-4.7, -2.9]	-

*p < 0.0001 (2-sided) for superiority, adjusted regarding multiplicity based on hierarchical testing of the HbA_{1c} value and body weight

Combination with sulfonylurea monotherapy

In SUSTAIN 6 (see subsection Cardiovascular disease) 123 patients were on sulfonylurea monotherapy at baseline. HbA_{1c} at baseline was 8.2%, 8.4% and 8.4% for Ozempic® 0.5 mg, Ozempic® 1 mg, and placebo, respectively. At week 30, the change in HbA_{1c} was -1.6%, -1.5% and 0.1% for Ozempic® 0.5 mg, Ozempic® 1 mg, and placebo, respectively.

Combination with premix insulin ± 1-2 OADs
In SUSTAIN 6 (see subsection Cardiovascular disease) 867 patients were on premix insulin (with or without OAD(s)) at baseline. HbA_{1c} at baseline was 8.8%, 8.9% and 8.9% for Ozempic® 0.5 mg, Ozempic® 1 mg, and placebo, respectively. At week 30, the change in HbA_{1c} was -1.3%, -1.8% and -0.4% for Ozempic® 0.5 mg, Ozempic® 1 mg, and placebo, respectively.

Cardiovascular disease

In a 104-week double-blind trial (SUSTAIN 6), 3,297 patients with type 2 diabetes mellitus at high cardiovascular risk were randomised to either Ozempic® 0.5 mg once weekly, Ozempic® 1 mg once weekly or corresponding placebo in addition to standard-of-care hereafter followed for 2 years. In total 98% of the patients completed the trial and the vital status was known at the end of the trial for 99.6% of the patients.

The trial population was distributed by age as: 1,598 patients (48.5%) ≥65 years, 321 (9.7%) ≥75 years, and 20 (0.6%) ≥85 years. There were 2,358 patients with normal or mild renal impairment, 832 with moderate and 107 with severe or end stage renal impairment. There were 61% males, the mean age was 65 years and mean BMI was 33 kg/m². The mean duration of diabetes was 13.9 years.

The primary endpoint was time from randomisation to first occurrence of a major adverse cardiovascular event (MACE): cardiovascular death, non-fatal myocardial infarction or non-fatal stroke.

The total number of primary component MACE endpoints was 254, including 108 (6.6%) with semaglutide and 146 (8.9%) with placebo. See figure 4 for results on primary and secondary cardiovascular endpoints. Treatment with semaglutide resulted in a 26% risk reduction in the primary composite outcome of death from cardiovascular causes, non-fatal myocardial infarction or non-fatal stroke. The total numbers of cardiovascular deaths, non-fatal myocardial infarctions and non-fatal strokes were 90, 111, and 71, respectively, including 44 (2.7%), 47 (2.9%), and 27 (1.6%), respectively, with semaglutide (figure 4). The risk reduction in the primary composite outcome was mainly driven by decreases in the rate of non-fatal stroke (39%) and non-fatal myocardial infarction (26%) (figure 3).

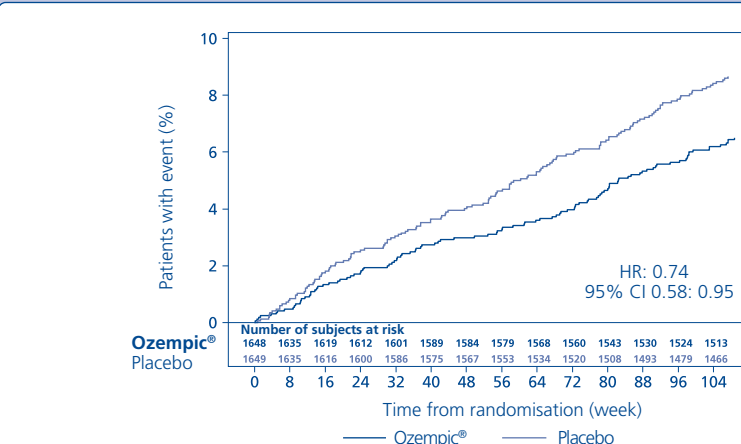


Figure 3 Kaplan-Meier plot of time to first occurrence of the composite outcome: cardiovascular death, non-fatal myocardial infarction or non-fatal stroke (SUSTAIN 6)

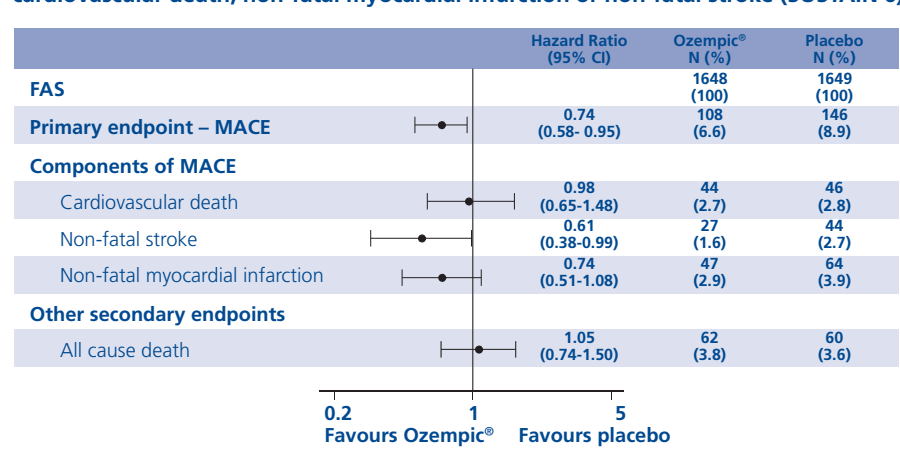


Figure 4 Forest plot: analyses of time to first occurrence of the composite outcome, its components and all cause death (SUSTAIN 6)

There were 158 events of new or worsening nephropathy. The hazard ratio [95% CI] for time to nephropathy (new onset of persistent macroalbuminuria, persistent doubling of serum creatinine, need for continuous renal replacement therapy and death due to renal disease) was 0.64 [0.46, 0.88] driven by new onset of persistent macroalbuminuria.

Body weight

After one year of treatment, a weight loss of ≥5% and ≥10% was achieved for more subjects with Ozempic® 0.5 mg (46% and 13%) and 1 mg (52-42% and 21-24%) compared with the active comparators sitagliptin (18% and 3%) and exenatide ER (17% and 4%).

In the 40-week trial vs. dulaglutide a weight loss of ≥5% and ≥10% was achieved for more subjects with Ozempic® 0.5 mg (44% and 14%) compared with dulaglutide 0.75 mg (23% and 3%) and Ozempic® 1 mg (up to 63% and 27%) compared with dulaglutide 1.5 mg (30% and 8%).

A significant and sustained reduction in body weight from baseline to week 104 was observed with Ozempic® 0.5 mg and 1 mg vs. placebo 0.5 mg and 1 mg, in addition to standard-of-care (-3.6 kg and -4.9 kg vs. -0.7 kg and -0.5 kg, respectively) in SUSTAIN 6.

Blood pressure

Significant reductions in mean systolic blood pressure were observed when Ozempic® 0.5 mg (3.5–5.1 mmHg) and 1 mg (5.4–7.3 mmHg) were used in combination with oral antidiabetic medicinal products or basal insulin. For diastolic blood pressure, there were no significant differences between semaglutide and comparators.

Pharmacokinetic properties

Compared to native GLP-1, semaglutide has a prolonged half-life of around 1 week making it suitable for once weekly subcutaneous administration. The principal mechanism of protraction is albumin binding, which results in decreased renal clearance and protection from metabolic degradation. Furthermore, semaglutide is stabilised against degradation by the DPP-4 enzyme.

Absorption

Maximum concentration was reached 1 to 3 days post dose. Steady state exposure was achieved following 4–5 weeks of once weekly administration. In patients with type 2 diabetes, the mean steady state concentrations following subcutaneous administration of 0.5 mg and 1 mg semaglutide were approximately 16 nmol/l and 30 nmol/l, respectively. Semaglutide exposure increased in a dose proportional manner for

doses of 0.5 mg and 1 mg. Similar exposure was achieved with subcutaneous administration of semaglutide in the abdomen, thigh, or upper arm. Absolute bioavailability of subcutaneous semaglutide was 89%.

Distribution

The mean volume of distribution of semaglutide following subcutaneous administration in patients with type 2 diabetes was approximately 12.5 l. Semaglutide was extensively bound to plasma albumin (>99%).

Metabolism/Biotransformation

Prior to excretion, semaglutide is extensively metabolised through proteolytic cleavage of the peptide backbone and sequential beta-oxidation of the fatty acid sidechain. The enzyme neutral endopeptidase (NEP) is expected to be involved in the metabolism of semaglutide.

Elimination

In a study with a single subcutaneous dose of radiolabelled semaglutide, it was found that the primary excretion routes of semaglutide-related material were via urine and faeces; approximately 2/3 of semaglutide-related material were excreted in urine and approximately 1/3 in faeces. Approximately 3% of the dose was excreted as intact semaglutide via urine. In patients with type 2 diabetes clearance of semaglutide was approximately 0.05 l/h. With an elimination half-life of approximately 1 week, semaglutide will be present in the circulation for about 5 weeks after the last dose.

Special population

Elderly
Age had no effect on the pharmacokinetics of semaglutide based on data from phase 3a studies including patients of 20–86 years of age.

Gender, race and ethnicity

Gender, race (White, Black or African-American, Asian) and ethnicity (Hispanic or Latino, non-Hispanic or Latino) had no effect on the pharmacokinetics of semaglutide.

Body weight

Body weight has an effect on the exposure of semaglutide. Higher body weight results in lower exposure; a 20% difference in body weight between individuals will result in an approximately 15% difference in exposure. Semaglutide doses of 0.5 mg and 1 mg provide adequate systemic exposure over a body weight range of 40–198 kg.

Renal impairment

Renal impairment did not impact the pharmacokinetics of semaglutide in a clinically relevant manner. This was shown with a single dose of 0.5 mg semaglutide for patients with different degrees of renal impairment (mild, moderate, severe or patients in dialysis) compared with subjects with normal renal function. This was also shown for subjects with type 2 diabetes and with renal impairment based on data from phase 3a studies, although the experience in patients with end-stage renal disease was limited.

Hepatic impairment

Hepatic impairment did not have any impact on the exposure of semaglutide. The pharmacokinetics of semaglutide were evaluated in patients with different degrees of hepatic impairment (mild, moderate, severe) compared with subjects with normal hepatic function in a study with a single-dose of 0.5 mg semaglutide.

Paediatric population

Semaglutide has not been studied in paediatric patients.

Preclinical safety data

Preclinical data reveal no special hazards for humans based on conventional studies of safety pharmacology, repeat-dose toxicity or genotoxicity.

Non-lethal thyroid C-cell tumours observed in rodents are a class effect for GLP-1 receptor agonists. In 2-year carcinogenicity studies in rats and mice, semaglutide caused thyroid C-cell tumours at clinically relevant exposures. No other treatment-related tumours were observed. The rodent C-cell tumours are caused by a non-genotoxic, specific GLP-1 receptor mediated mechanism to which rodents are particularly sensitive. The relevance for humans is considered to be low, but cannot be completely excluded.

In fertility studies in rats, semaglutide did not affect mating performance or male fertility. In female rats, an increase in oestrous cycle length and a small reduction in *corpora lutea* (ovulations) were observed at doses associated with maternal body weight loss.

In embryo-foetal development studies in rats, semaglutide caused embryotoxicity below clinically relevant exposures. Semaglutide caused marked reductions in maternal body weight and reductions in embryonic survival and growth. In foetuses, major skeletal and visceral malformations were observed, including effects on long bones, ribs, vertebrae, tail, blood vessels and brain ventricles. Mechanistic evaluations indicated that the embryotoxicity involved a GLP-1 receptor mediated impairment of the nutrient supply to the embryo across the rat yolk sac. Due to species differences in yolk sac anatomy and function, and due to lack of GLP-1 receptor expression in the yolk sac of non-human primates, this mechanism is considered unlikely to be of relevance to humans. However, a direct effect of semaglutide on the foetus cannot be excluded.

In developmental toxicity studies in rabbits and cynomolgus monkeys, increased pregnancy loss and slightly increased incidence of foetal abnormalities were observed at clinically relevant exposures. The findings coincided with marked maternal body weight loss of up to 16%.

Whether these effects are related to the decreased maternal food consumption as a direct GLP-1 effect is unknown.

Postnatal growth and development were evaluated in cynomolgus monkeys. Infants were slightly smaller at delivery, but recovered during the lactation period.

In juvenile rats, semaglutide caused delayed sexual maturation in both males and females. These delays had no impact upon fertility and reproductive capacity of either sex, or on the ability of the females to maintain pregnancy.

List of excipients

Disodium phosphate dihydrate, propylene glycol, phenol, hydrochloric acid (for pH adjustment), sodium hydroxide (for pH adjustment) and water for injections.

Incompatibilities

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

Special precautions for storage

Before first use: Store in a refrigerator (2°C to 8°C). Keep away from the cooling element. Do not freeze Ozempic® and do not use Ozempic® if it has been frozen.

After first use: After first use the medicinal product may be stored for a maximum of 6 weeks. Store below 30°C or in a refrigerator (2°C to 8°C). Do not freeze Ozempic® and do not use Ozempic® if it has been frozen.

Keep the pen cap on when the pen is not in use in order to protect it from light. Always remove the injection needle after each injection and store the pen without a needle attached. This may prevent blocked needles, contamination, infection, leakage of solution and inaccurate dosing.

Nature and contents of container

1.5 ml glass cartridge (type I glass) closed at the one end with a rubber plunger (chlorobutyl) and at the other end with an aluminium cap with a laminated rubber sheet (bromobutyl/polypropylene) inserted. The cartridge is assembled into a disposable pre-filled pen made of polypropylene, polyoxymethylene, polycarbonate and acrylonitrile butadiene styrene.

Body weight

Body weight has an effect on the exposure of semaglutide. Higher body weight results in lower exposure; a 20% difference in body weight between individuals will result in an approximately 15% difference in exposure. Semaglutide doses of 0.5 mg and 1 mg provide adequate systemic exposure over a body weight range of 40–198 kg.

Pack size:

1 pre-filled pen and 4 disposable NovoFine® Plus needles.

Each pre-filled pen contains 1.5 ml of solution, delivering doses of 0.5 mg.

Special precautions for disposal and other handling

The patient should be advised to discard the injection needle after each injection and store the pen without an injection needle attached. This may prevent blocked needles, contamination, infection, leakage of solution and inaccurate dosing. Needles and other waste material should be disposed of in accordance with local requirements.

The pen is for use by one person only. Ozempic® should not be used if it does not appear clear and colourless or almost colourless. Ozempic® should not be used if it has been frozen.

Ozempic® can be administered with needles up to a length of 8 mm. The pen is designed to be used with NovoFine® or NovoTwist® disposable needles. NovoFine® Plus needles are included in the package.

Marketing authorisation holder

Novo Nordisk A/S
Novo Allé
DK-2880 Bagsværd
Denmark

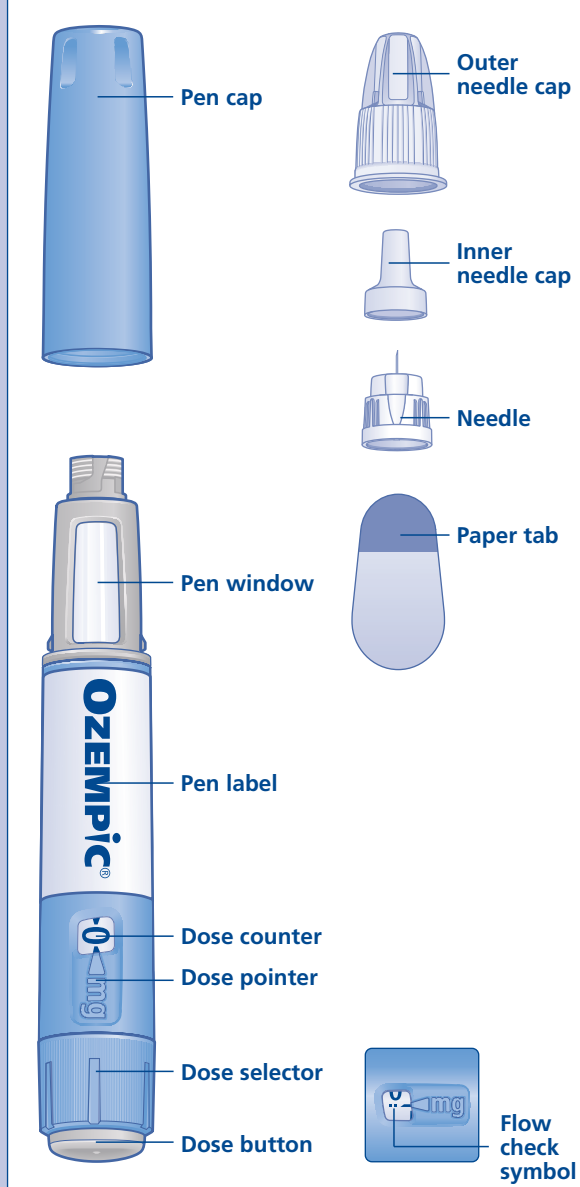
Instructions on how to use Ozempic® 0.5 mg solution for injection in pre-filled pen

Please read these instructions carefully before using your Ozempic® pre-filled pen. Do not use the pen without proper training from your doctor or nurse.

Start by checking your pen to make sure that it contains Ozempic® 0.5 mg, then look at the illustrations below to get to know the different parts of your pen and needle. If you are blind or have poor eyesight and cannot read the dose counter on the pen, do not use this pen without help. Get help from a person with good eyesight who is trained to use the Ozempic® pre-filled pen.

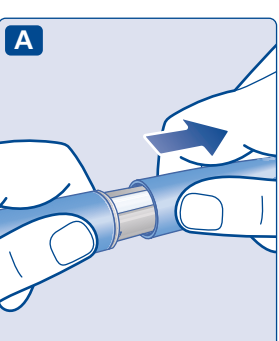
Your pen is a pre-filled dial-a-dose pen. It contains 2 mg of semaglutide, and you can only select doses of 0.5 mg. Your pen is designed to be used with NovoFine® and NovoTwist® disposable needles up to a length of 8 mm. NovoFine® Plus needles are included in the pack.

Ozempic® pre-filled pen and needle (example)

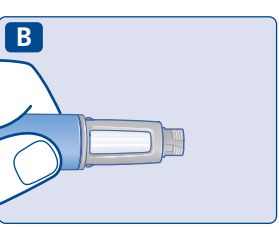


1. Prepare your pen with a new needle

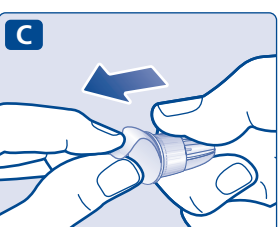
- Check the name and coloured label of your pen, to make sure that it contains Ozempic®. This is especially important if you take more than one type of injectable medicine. Using the wrong medicine could cause severe harm to your health.
- Pull off the pen cap.



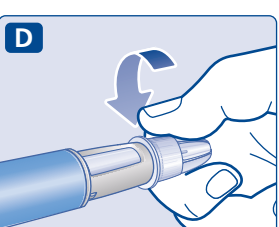
- Check that the solution in your pen is clear and colourless. Look through the pen window. If the solution looks cloudy or coloured, do not use the pen.



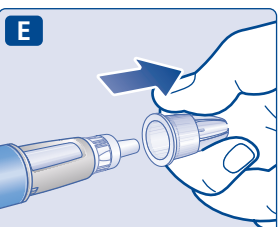
- Take a new needle. Check the paper tab and the outer needle cap for damages that could affect sterility. If any damage is seen use a new needle.
- Tear off the paper tab.



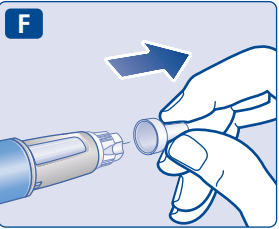
- Push the needle straight onto the pen. Turn until it is on tight.



- Pull off the outer needle cap and keep it for later. You will need it after the injection, to safely remove the needle from the pen.



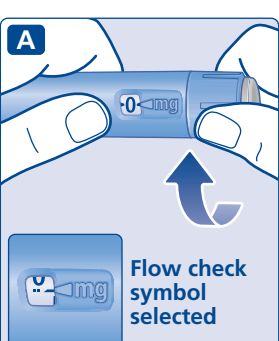
- Pull off the inner needle cap. If you try to put it back on, you may accidentally stick yourself with the needle. A drop of solution may appear at the needle tip. This is normal, but you must still check the flow, if you use a new pen for the first time. See step 2 'Check the flow'.
- Do not attach a new needle to your pen until you are ready to take your injection.



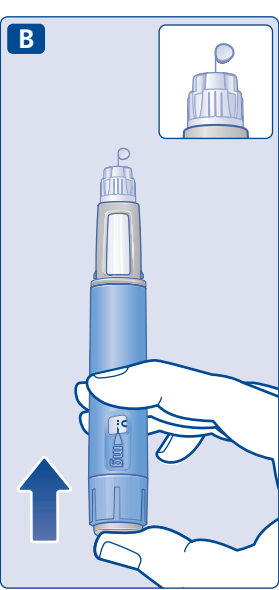
- Always use a new needle for each injection. This reduces the risk of blocked needles, contamination, infection and inaccurate dosing.
- Never use a bent or damaged needle.

2. Check the flow

- Before your first injection with each new pen, check the flow. If your pen is already in use, go to step 3 'Select your dose'.
- Turn the dose selector until the dose counter shows the flow check symbol (♦♦♦♦).



- Hold the pen with the needle pointing up. Press and hold in the dose button until the dose counter returns to 0. The 0 must line up with the dose pointer. A drop of solution should appear at the needle tip.

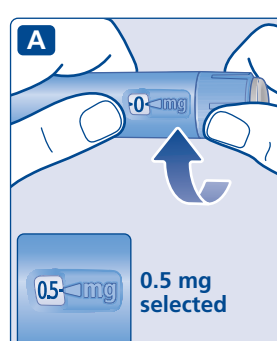


A small drop may remain at the needle tip, but it will not be injected. If no drop appears, repeat step 2 'Check the flow' up to 6 times. If there is still no drop, change the needle and repeat step 2 'Check the flow' once more. If a drop still does not appear, dispose of the pen and use a new one.

- Always make sure that a drop appears at the needle tip before you use a new pen for the first time. This makes sure that the solution flows. If no drop appears, you will not inject any medicine even though the dose counter may move. This may indicate a blocked or damaged needle. If you do not check the flow before your first injection with each new pen, you may not get the prescribed dose and the intended effect of Ozempic®.

3. Select your dose

- Turn the dose selector to select 0.5 mg. Keep turning until the dose counter stops and shows 0.5 mg.



Only the dose counter and dose pointer will show that 0.5 mg has been selected. The dose selector clicks differently when turned forwards, backwards or past 0.5 mg. Do not count the pen clicks.

- Always use the dose counter and the dose pointer to see that 0.5 mg has been selected before injecting this medicine. Do not count the pen clicks. 0.5 mg in the dose counter must line up precisely with the dose pointer to ensure that you get a correct dose.

How much solution is left

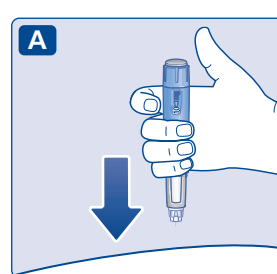
- To see how much solution is left, use the dose counter. Turn the dose selector until the dose counter stops. If it shows 0.5, at least 0.5 mg is left in your pen. If the dose counter stops before 0.5 mg, there is not enough solution left for a full dose of 0.5 mg.



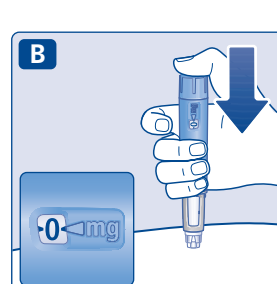
- If there is not enough solution left in your pen for a full dose, do not use it. Use a new Ozempic® pen.

4. Inject your dose

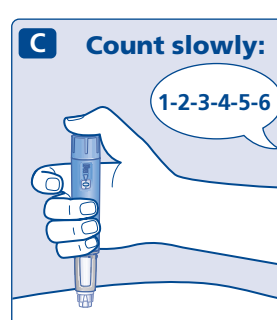
- Insert the needle into your skin as your doctor or nurse has shown you.
- Make sure you can see the dose counter. Do not cover it with your fingers. This could interrupt the injection.



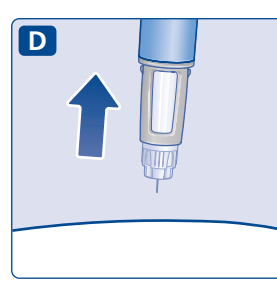
- Press and hold down the dose button until the dose counter shows 0. The 0 must line up with the dose pointer. You may then hear or feel a click.



- Keep the needle in your skin after the dose counter has returned to 0 and count slowly to 6. This is to make sure that you get your full dose.
- If the needle is removed earlier, you may see a stream of solution coming from the needle tip. If so, the full dose will not be delivered.

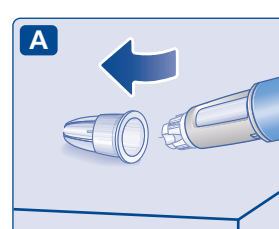


- Remove the needle from your skin. If blood appears at the injection site, press lightly. Do not rub the area.

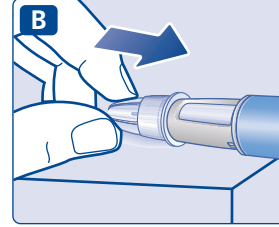


5. After your injection

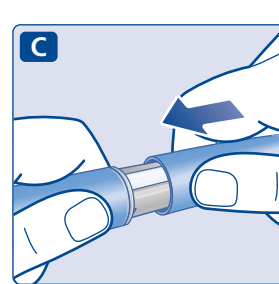
- Lead the needle tip into the outer needle cap on a flat surface without touching the needle or the outer needle cap.



- Once the needle is covered, carefully push the outer needle cap completely on.
- Unscrew the needle and dispose of it carefully in accordance with local guidelines. Ask your doctor, nurse or pharmacist about sharps disposal.



- Put the pen cap on your pen after each use to protect the solution from light.



Always dispose of the needle after each injection to ensure convenient injections and prevent blocked needles. If the needle is blocked, you will not inject any medicine. When the pen is empty, throw it away without a needle on as instructed by your doctor, nurse, pharmacist or local authorities.

- Never try to put the inner needle cap back on the needle. You may stick yourself with the needle.
- Always remove the needle from your pen immediately after each injection. This reduces the risk of blocked needles, contamination, infection, leakage of solution and inaccurate dosing.

Further important information

- Always keep your pen and needles out of the sight and reach of others, especially children.
- Never share your pen or your needles with other people.

- Caregivers must be very careful when handling used needles to prevent needle injury and cross-infection.

Caring for your pen

Treat your pen with care. Rough handling or misuse may cause inaccurate dosing. If this happens you might not get the intended effect of this medicine.

- Do not inject Ozempic® which has been frozen. If you do that, you might not get the intended effect of this medicine.
- Do not inject Ozempic® which has been exposed to direct sunlight. If you do that, you might not get the intended effect of this medicine.
- Do not expose your pen to dust, dirt or liquid.
- Do not wash, soak or lubricate your pen. If necessary, clean it with a mild detergent on a moistened cloth.

- Do not drop your pen or knock it against hard surfaces. If you drop it or suspect a problem, attach a new needle and check the flow before you inject.
- Do not try to refill your pen. Once empty, it must be disposed of.
- Do not try to repair your pen or pull it apart.



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6	Iyer, Shobhana R (SIR@NOVO NORDISK. COM)	QA APPRO VER	Novo Nordisk (Business Users)	May 19, 2023 at 10:16 PM GMT+08:00	Approve d (QA Approval)	