A PHARMACODYNAMIC COMPARISON OF SELECT SGLT2is*

	INVOKANA®[1]	Empagliflozin[4]	Dapagliflozin[5]
UGE (g/day)	• UGE ranged from **77 to 119 g/day** in subjects with type 2 diabetes treated with either 100 mg or 300 mg of canagliflozin across the Phase 1 studies. • Increases in UGE were sustained over a 26-week dosing period.	• UGE averaged approximately **64 g/day with 10 mg empagliflozin and 78 g/day with 25 mg empagliflozin once daily** in patients with type 2 diabetes. • UGE increased immediately and was maintained at the end of a 4-week treatment period.	• UGE of approximately **70 g of glucose** per day at a dapagliflozin dose of 10 mg/day in patients with type 2 diabetes mellitus for 12 weeks. • Evidence of sustained glucose excretion was observed for up to 2 years.
kcal/day	• The UGE observed translates to a loss of **308 to 476 kcal/day**.	• The UGE observed translates to a loss of **256 to 312 kcal/day**.[6‡]	• The UGE observed translates to a loss of **280 kcal/day**.

Adapted from separate product monographs.
SGLT2i=sodium-glucose co-transporter 2 inhibitor.
* Comparative clinical significance has not been established.
‡ As determined by calculation (1 g glucose = 4 kcal).

References:

1. INVOKANA® Product Monograph. Janssen Inc. May 20, 2020.
2. Data on file. Janssen Inc.
3. Schernthaner G, Gross JL, Rosenstock J, *et al*. Canagliflozin compared with sitagliptin for patients with type 2 diabetes who do not have adequate glycemic control with metformin plus sulfonylurea: a 52-week randomized trial. *Diabetes Care* 2013;36(9):2508–2515.
4. JARDIANCE Product Monograph. Boehringer Ingelheim Canada Ltd. April 6, 2022.
5. FORXIGA Product Monograph. AstraZeneca Canada Inc. August 6, 2021.
6. Elements within the Nutrition Facts table. Government of Canada. https://inspection.canada.ca/food-label-requirements/labelling/industry/nutrition-labelling/elements-within-the-nutrition-facts-table/eng/1613599715710/1613599936553#s2c1. Accessed July 25, 2022.

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Pr Invokana® canagliflozin tablets

INVOKANA® was the FIRST-TO-MARKET SGLT2i* indicated:

As an adjunct to diet and exercise to improve glycemic control in adult patients with type 2 diabetes mellitus for whom metformin is inappropriate due to contraindications or intolerance.

INVOKANA® is also indicated for use in adult patients with type 2 diabetes mellitus to improve glycemic control in combination with:

- metformin
- sulfonylurea (with or without metformin)
- pioglitazone with metformin
- metformin and sitagliptin
- insulin (with or without metformin)

when the therapy listed above, along with diet and exercise, does not provide adequate glycemic control.

PHARMACODYNAMICS

Increases in urinary glucose excretion (UGE) observed with INVOKANA®*

77 to 119 g/day	UGE (g/day) » UGE ranged from **77 to 119 g/day** in subjects with type 2 diabetes treated with either 100 mg or 300 mg of INVOKANA® across the Phase 1 studies.
308 to 476 kcal/day†§	kcal/day » The UGE observed translates to a loss of **308 to 476 kcal/day**.

INCREASED UGE TRANSLATES TO:†§

Decreased plasma glucose concentration by an insulin-independent mechanism in patients with type 2 diabetes.

Loss of calories and therefore a reduction in body weight. *INVOKANA® is not indicated for weight reduction.*

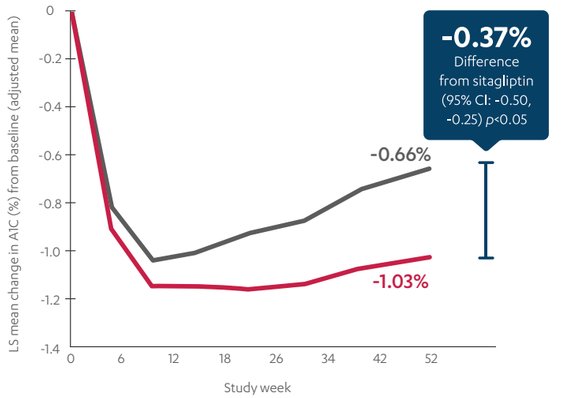
Osmotic diuresis, leading to a reduction in systolic blood pressure. *INVOKANA® is not indicated for blood pressure control.*

SGLT2i=sodium-glucose co-transporter 2 inhibitor.
* Clinical significance has not been established.
† Comparative clinical significance has not been established.
§ Demonstrated in Phase 1 studies in patients with type 2 diabetes mellitus treated with INVOKANA® 100 mg or 300 mg.

In a study comparing INVOKANA® 300 mg to sitagliptin 100 mg as add-on therapy with metformin and a sulfonylurea in a general population of patients with T2D

Patients treated with **INVOKANA® achieved a superior mean decrease in A1C of 1.03%** at 52 weeks (vs. a mean decrease of 0.66% with sitagliptin)[1*]

MEAN CHANGE IN A1C FROM BASELINE[1]



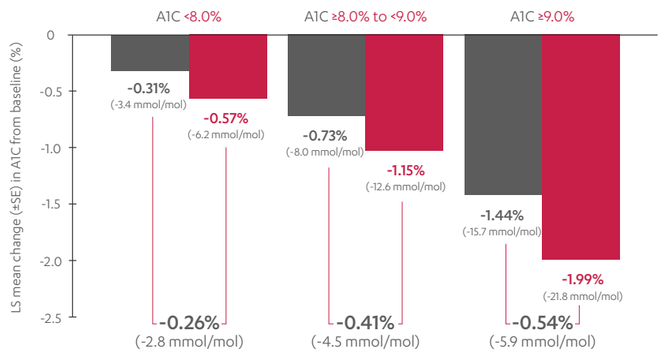
Adapted from the INVOKANA® Product Monograph.[1]

35% more patients on INVOKANA® reached glycemic target than with sitagliptin[1*]

47.6% (INVOKANA®) vs. 35.3% (sitagliptin) of patients achieved an A1C <7% (secondary endpoint)

DEMONSTRATED A1C LOWERING REGARDLESS OF BASELINE A1C

Adjusted mean change in A1C from baseline with INVOKANA® 300 mg vs. sitagliptin 100 mg at 52 weeks by baseline A1C subgroup[3*]



Adapted from Schernthaner G, *et al.*, 2013.[3]

Indications:

INVOKANA® (canagliflozin) is indicated as an adjunct to diet and exercise to improve glycemic control in adult patients with type 2 diabetes mellitus:

- As a monotherapy in patients for whom metformin is inappropriate due to contraindications or intolerance.
- In combination with metformin or a sulfonylurea when diet and exercise plus monotherapy with one of these agents do not provide adequate glycemic control.
- In combination with metformin and either a sulfonylurea or pioglitazone when diet, exercise and dual therapy (with metformin plus either a sulfonylurea or pioglitazone) do not provide adequate glycemic control.
- In combination with metformin and sitagliptin when diet, exercise and dual therapy (with metformin and sitagliptin) do not provide adequate glycemic control.
- In combination with insulin (with or without metformin) when diet, exercise and insulin therapy do not provide adequate glycemic control.

INVOKANA® is also indicated as an adjunct to diet, exercise and standard-of-care therapy to reduce the risk of major adverse cardiovascular events (cardiovascular [CV] death, nonfatal MI and nonfatal stroke) in adults with type 2 diabetes mellitus and established cardiovascular disease (CVD).

INVOKANA® (canagliflozin) is also indicated as an adjunct to diet, exercise and standard-of-care therapy to reduce the risk of end-stage kidney disease, doubling of serum creatinine, and CV death in adult patients with type 2 diabetes mellitus and diabetic nephropathy with albuminuria (>33.9 mg/mmol).

Clinical use:

Patients 65 years and older had a higher incidence of adverse reactions related to reduced intravascular volume, including hypotension, postural dizziness, orthostatic hypotension, syncope and dehydration. Reactions were more common in patients over 75 years of age and with 300 mg daily. Smaller reductions in HbA1C with INVOKANA® relative to placebo were seen in patients 65 years and older, compared to younger patients.

Contraindications: Patients on dialysis.

Most serious warnings and precautions:

Diabetic Ketoacidosis (DKA): Clinical trial and post-market cases of DKA, a serious life-threatening condition requiring urgent hospitalization, have been reported in patients with type 2 diabetes mellitus treated with INVOKANA® or other sodium-glucose co-transporter 2 (SGLT2) inhibitors. Fatal cases of DKA have been reported in patients taking INVOKANA®. A number of these cases have been atypical with blood glucose values below 13.9 mmol/L (250 mg/dL). The risk of DKA must be considered in the event of non-specific symptoms such as difficulty breathing, nausea, vomiting, abdominal pain, confusion, anorexia, excessive thirst and unusual fatigue or sleepiness. If these symptoms occur, regardless of blood glucose level, INVOKANA® treatment should be **immediately discontinued and patients should be assessed for DKA immediately.**

INVOKANA® should not be used for the treatment of DKA or in patients with a history of DKA. Nephropathy may increase the risk of DKA during treatment with INVOKANA®. INVOKANA® is not indicated, and should not be used, in patients with type 1 diabetes.

Lower Limb Amputation: An approximately 2-fold increased risk of lower limb amputations associated with INVOKANA® use was observed in CANVAS and CANVAS-R, two large, randomized, placebo-controlled trials in patients with type 2 diabetes who had established CVD or were at risk for CVD. Amputations of the toe and midfoot were most frequent; however, amputations involving the leg were also observed. Some patients had multiple amputations, some involving both limbs. Before initiating INVOKANA®, consider factors that may increase the risk of amputation, such as a history of prior amputation, peripheral vascular disease, neuropathy and diabetic foot ulcers.

Monitor patients receiving INVOKANA® for infection, new pain or tenderness, sores or ulcers involving the lower limbs, and discontinue INVOKANA® if these complications occur.

Other relevant warnings and precautions:

- Risk of DKA, particularly in patients on a very low carbohydrate diet and patients with: conditions that lead to restricted food intake or severe dehydration; increased insulin requirement due to an acute medical illness, surgery, or alcohol abuse; low beta-cell function reserve (e.g., type 2 diabetes patients with low C-peptide or latent autoimmune diabetes in adults); pancreatic disorders suggesting insulin deficiency (e.g., type 1 diabetes, history of pancreatitis or pancreatic surgery); insulin dose reduction (including insulin pump failure); history of ketoacidosis. Temporarily discontinue treatment in patients who are hospitalized for major surgical procedures, or will undergo scheduled surgery, and patients who are hospitalized for serious infections or acute serious medical illnesses. Monitor patients for DKA even if treatment was interrupted or discontinued; ensure risk factors are resolved prior to restarting INVOKANA®. Educate patients on signs and symptoms of DKA and instruct them to discontinue INVOKANA® and seek immediate medical attention if they occur.
- Risk of reduced intravascular volume may lead to postural dizziness, orthostatic hypotension, hypotension, or renal failure, particularly in patients on loop diuretics or medications that interfere with the renin-angiotensin-aldosterone system (e.g., angiotensin-converting-enzyme [ACE] inhibitors, angiotensin receptor blockers [ARBs]), patients with low systolic blood pressure, patients with moderate renal impairment, and elderly patients. Not recommended for use in patients receiving loop diuretics or who are volume-depleted. Normalize volume before initiating INVOKANA®. Volume status should be assessed prior to treatment initiation and carefully monitored throughout therapy in those at risk.
- Risk of hypoglycemia in add-on therapy with other antihyperglycemic agents.
- Monitor for increases in LDL-C.
- Risk of genital mycotic infections and urinary tract infections.
- Risk of Fournier's gangrene (necrotizing fasciitis of the perineum), a rare but serious and potentially life-threatening infection requiring urgent treatment.
- Use with caution in patients with elevated hemoglobin/hematocrit.
- Risk of serious hypersensitivity reactions, including angioedema and anaphylaxis.
- Risk of bone fracture.
- Risk of increased serum creatinine, decreased eGFR (in a dose-dependent fashion), and renal function abnormalities and acute kidney injury including acute renal failure and decline in eGFR.
- Renal function should be assessed prior to initiation and regularly thereafter, with more frequent and intensive monitoring for glycemic and renal biomarkers and signs and symptoms of renal dysfunction in patients whose eGFR is <60 mL/min/1.73 m^2, especially if eGFR is <45 mL/min/1.73 m^2. The glucose-lowering benefit of INVOKANA® decreases with declining renal function and has not been demonstrated for patients with eGFR <30 mL/min/1.73 m^2.
- Do not use in pregnant and breastfeeding women.
- INVOKANA® may increase digoxin AUC and C_{max}; patients taking concomitant digoxin should therefore be monitored appropriately.
- Not recommended in patients with severe hepatic impairment.
- Monitor blood glucose and A1C.

For more information:

Please consult the Product Monograph at www.janssen.com/canada/our-medicines for important information relating to adverse reactions, drug interactions, and dosing and administration information which have not been discussed in this piece. The Product Monograph is also available by calling 1-800-567-3331.

PrInvokana® canagliflozin tablets

A1C=glycated hemoglobin; CI=confidence interval; LS=least squares; T2D=type 2 diabetes.
* Randomized, double-blind, active-controlled, parallel-group, multicentre trial over 52 weeks. 755 adults with type 2 diabetes mellitus (T2D) were randomized to INVOKANA® 300 mg/day + metformin + a sulfonylurea (n=377) or sitagliptin 100 mg/day + metformin + a sulfonylurea (n=378). Baseline (mean) A1C values were 8.12% for INVOKANA® 300 mg and 8.13% for sitagliptin 100 mg.

MI=myocardial infarction; eGFR=estimated glomerular filtration rate.