



## Common Drug Review *Patient Group Input Submissions*

### **Canagliflozin (Invokana) for Diabetes Mellitus, Type 2**

**Patient group input submissions were received from the following patient groups. Those with permission to post are included in this document.**

Canadian Diabetes Association — permission granted to post

#### **CADTH received patient group input for this review on or before August 28, 2014**

CADTH posts all patient input submissions to the Common Drug Review received on or after February 1, 2014 for which permission has been given by the submitter. This includes patient input received from individual patients and caregivers as part of that pilot project.

The views expressed in each submission are those of the submitting organization or individual; not necessarily the views of CADTH or of other organizations. While CADTH formats the patient input submissions for posting, it does not edit the content of the submissions.

CADTH does use reasonable care to prevent disclosure of personal information in posted material; however, it is ultimately the submitter's responsibility to ensure no personal information is included in the submission. The name of the submitting patient group and all conflict of interest information are included in the posted patient group submission; however, the name of the author, including the name of an individual patient or caregiver submitting the patient input, are not posted.

## Canadian Diabetes Association

### 1. General Information

<b>Name of the drug CADTH is reviewing and indication(s) of interest</b>	Invokana (Canagliflozin) Type 2 Diabetes
<b>Name of the patient group</b>	Canadian Diabetes Association
<b>Name of the primary contact for this submission:</b>	██████████
Position or title with patient group	████████████████████
Email	████████████████████
Telephone number(s)	██████████
<b>Name of author (if different)</b>	
<b>Patient group's contact information:</b>	Canadian Diabetes Association
Email	advocacy@diabetes.ca
Telephone	613 688 5938
Address	45 Montreal Road Ottawa, ON, K1L 6E8
Website	<a href="http://www.diabetes.ca">www.diabetes.ca</a>
<b>Permission is granted to post this submission</b>	Yes

#### 1.1 Submitting Organization

The Canadian Diabetes Association (the Association) leads the fight against diabetes by helping people with diabetes live healthy lives while we work to find a cure. It has a heritage of excellence and leadership, and its co-founder, Dr. Charles Best, along with Dr. Frederick Banting, is credited with the co-discovery of insulin. The Association is supported in its efforts by a community-based network of volunteers, employees, health care professionals, researchers, and partners. By providing education and services, advocating on behalf of people with diabetes, supporting research, and translating research into practical applications, the Association is delivering on its mission.

#### 1.2 Conflict of Interest Declarations

The Canadian Diabetes Association (the Association) solicits and receives unrestricted educational grants from multiple manufacturers/vendors of pharmaceuticals, supplies and devices for diabetes and its complications. These funds help the Association to support community programs and services for people with diabetes, fund research and advocacy, across Canada. Sponsors were not involved in developing this submission. The Association did not have any conflicts of interest in the preparation of this submission.

## **2. Condition and Current Therapy Information**

### **2.1 Information Gathering**

The Canadian Diabetes Association (the Association) solicited patient input through a survey distributed through social media and email blasts. The survey was open for approximately 2 weeks and included questions on how diabetes impacts the lives of patients, current drug therapy, previous experience with drug therapy and experience with canagliflozin (Invokana). Among the 388 individuals who responded, 92.8% identified themselves as patients living with type 2 diabetes, 4.1% as caregivers for someone with type 2 diabetes, 0.5% as having type 1 diabetes, and 2.6 % as other. The survey data reported in this submission are from those people living with diabetes or caring for someone with type 2 diabetes (n=376). Of those 376 responding 93% are taking (or had taken) diabetes medication. Approximately 7.6 (n=13)% had taken canagliflozin. A total of 250 respondents completed the full questionnaire with a range from 388 to 250 respondents for individual questions.

### **2.2 Impact of Condition on Patients**

Type 2 diabetes is a chronic (progressive) condition that occurs when the pancreas does not produce enough insulin or when the body does not effectively use the insulin that is produced. Insulin is a hormone that controls the amount of glucose in the blood. Common symptoms of diabetes include fatigue, thirst and weight change. High blood glucose levels can cause long-term complications such as blindness, heart disease, kidney problems, nerve damage and erectile dysfunction. The goal of diabetes management is to keep glucose levels within the target range to minimize symptoms and avoid or delay the complications.

Diabetes requires considerable self-management, including healthy eating, regular physical activity, healthy body weight, taking diabetes medications (oral and/or injection) as prescribed, monitoring blood glucose and stress management. Poor glucose control can result in serious long-term complications. Patients in the survey were asked which aspects of diabetes were the most important. The majority of patients indicated that daily fluctuations in blood sugar were the most important aspect of diabetes to control during the day and overnight. The fluctuations impact the ability to work, interactions with friends and family, causes stress and worry as well as ability to participate in normal activities of daily living. Uncontrolled diabetes and the stigma associated with the disease can result in reduced quality of life. Maintaining control of diabetes has potential to reduce anxiety and avoid or delay complications as well as improve overall quality of life.

There was a frequent emphasis on the psychological and emotional impact of diabetes on the lives of respondents (effect on stress, anxiety, adjusting to changes in diet and lifestyle, medication and treatment management as well as relationships with family). Respondents also described fatigue, and lack of energy.

“Having diabetes makes me useless. I have no energy or strength to enjoy life anymore. I can't do partial jobs around house. I can't enjoy sports anymore. Diabetes has instill (sic) a fear in me.”

Management of diabetes includes lifestyle changes (diet, exercise and stress management). Inevitably, most patients are prescribed one or more medications to achieve glucose control. This usually starts with metformin (oral agent) and, if target glucose levels are not met, other medications are added. Over time most patients will be treated with multiple diabetes medications in order to achieve glycemic control. Many patients with diabetes do not take oral glucose-lowering therapy as prescribed. Almost 30% of respondents found it somewhat difficult, difficult, or very difficult to take multiple medications

through the day. Given that diabetes frequently occurs with other chronic conditions, this finding has significant implications for the diabetes population.

Selected quotes from respondents when asked about challenges related to diabetes:

“It is a life altering disease that impacts every aspect of life. There is constant blood monitoring, diet, level of activity, cost of expensive supplies and medication.”

“The most distressing side effect of all of the diabetes drugs is they make you gain weight or prevent weight loss. It is annoying to be told to lose weight then handed a drug that prevents weight loss”

“Basically it's an awful experience, experience highs and lows. Exercising can make my sugars low so I have to always have a snack with me. Eating anywhere besides home is a challenge as you don't know how things are made. I'm constantly checking my blood and I take 13 pills a day.”

“...problems are mostly trying to lose weight.....Took 5 Metformin pills (1 a day for 5 days ) and put on 2 pounds a day. Took over a month to loose that 10 pounds.”

Approximately 56% of all respondents indicated general satisfaction (satisfied or very satisfied) with drug therapy. Yet this respondent stated the greatest desire of all people living with diabetes:

“I am always wishing that there would be a PERMANENT cure for Diabetes Type 2.”

### **2.3 Patients' Experiences With Current Therapy**

A large proportion of people with type 2 diabetes fail to achieve optimal glycemic control, which places patients at risk for both acute and chronic diabetes complications. Initial therapy is most often with metformin, but over time, most patients will require the addition of a second or third agent to reach glycemic targets. Many of the currently available second-line therapies cause significant weight gain while their ability to achieve optimal glycemic control may be limited by hypoglycemia.

Surveyed patients were asked to “rate” the importance of various benefits and risks associated with diabetes medications, using a five-point scale from “not at all important” to “very important.” The most important benefit of therapy was noted as “blood sugars kept at satisfactory levels” during the day and overnight. Respondents also acknowledged “GI side effects” and “losing or not gaining weight” as important factors in selecting their individual drug therapy. This is consistent with qualitative responses provided, for example:

“I am fighting high blood sugars. .... I exercise - walking the dog - and generally follow a healthy eating routine but still end up with morning highs. It gets very frustrating having to count carbs all the time and never being able to eat anything extra without getting a high. I take many drugs.....started a new one, but after 6 weeks of nausea my doctor took me off it.”

Respondents were asked to provide, in their own words, the benefits and side effects of their drug therapy. All responses were categorized by theme and then grouped by sub-themes. The majority respondents stated they were mostly satisfied with drug therapy and with the fact that their blood sugar levels were kept at target. However, a significant number of respondents struggled with fluctuations and expressed extreme frustration with the lack of control. Several respondents identified previous prescribed drugs as having intolerable side effects – mostly hypoglycemia, morning hyperglycemia and

gastrointestinal effects, including nausea and diarrhea. Other concerns raised from respondents were related to the need for multiple medications, cost of treatment, and lack of insurance coverage.

Overall, respondents were more satisfied than dissatisfied with their medications in terms of the ability to manage their blood sugar levels. However, there were issues with side effects and administration.

### **3. Information about the Drug Being Reviewed**

The availability of canagliflozin to offer an alternative treatment option for stabilizing blood glucose is important to patients. Canagliflozin, belongs to a new class of drugs to lower blood glucose through inhibition of subtype 2 sodium-glucose transport protein (SGLT2), which is responsible for at least 90% of the glucose reabsorption in the kidney. The SGLT2 inhibition also causes a reduction in blood pressure and weight loss.

Respondents were asked to rate their level of knowledge of the canagliflozin (Invokana), regardless if they have taken the drug using a four-point scale from “have not heard about” to “know a lot about”. Respondents had very little knowledge of canagliflozin, with 10% of respondents indicating some knowledge and 2% indicating a lot of knowledge. Among those surveyed, the most frequent expectation for any new therapy was to have better blood glucose control, including fewer instances of hyperglycemia and hypoglycemia. While most indicated the expectation of fewer side effects (including hypoglycemia and weight gain), others indicated they worry about any side effects of medications.

Only 13 respondents had drug experience with canagliflozin. Of these, 10 people qualitatively described treatment. Four were very pleased with the glucose control and experienced no notable side effects. These patients described the relief of finally receiving treatment that controlled their blood glucose. “Just started taking Invokana, it has made a huge difference in my blood sugars. I seem to finally have the right combination.”

“I like the fact that there is little to no side effects associated with these medications.”

“It has actually lowered my blood sugar levels to a range of readings that I haven't seen in several years.”

Three patients described increased urination, one described persistent yeast infection. One of these patients discontinued canagliflozin due to the frequent urination.

Survey respondents were asked how important is it to have new drug therapy for glucose lowering also reduce weight. Approximately 78% indicated that it was between important to essential that these drugs also reduce weight.

Survey respondents were asked how important is it to have new drug therapy for glucose lowering also reduce blood pressure. Approximately 80% indicated that it was between important to essential that these drugs also reduce blood pressure.

Approximately 80% of respondents indicated that the availability of canagliflozin is important to people living with diabetes. Patients stated:

“Weight & hypertension are often problems for diabetics & contribute to many complications of diabetes.”

“It gives Dr. more options to try for patients”

In summary, diabetes is a very common chronic progressive condition that requires intensive self-management. To achieve optimal blood glucose levels, individualization of therapy is essential, including selecting the drug or combination of drugs, route of administration (oral, injection, pen or pump), how frequently the patient monitors blood glucose and adjusts dosage, the benefits and risks that the patient experiences and/or tolerates, and the lifestyle changes the patient is willing or able to make.

There are clear expectations that new drugs should offer better blood glucose control to prevent hyperglycemic and hypoglycemic episodes, as well as longer term control. The patients with canagliflozin experience stated good results in terms of glucose control. A few patients described increased urination and one described a yeast infection; once patient discontinued therapy after 3 weeks.

Responses to this survey reinforce the understanding that people living with diabetes often have co-morbidities including overweight/obesity, hypertension and other chronic conditions. Their clinical profile and preference and tolerance of therapy can direct physicians to the most appropriate drug therapy. The availability of the canagliflozin provides an important option for patients.

## APPENDIX: ORGANIZATIONS AND FOUNDATIONS THAT MADE DONATIONS TO THE CANADIAN DIABETES ASSOCIATION BETWEEN SEPTEMBER 2012 AND AUGUST 2013

593123 Alberta Ltd.	Chartwell Retirement Residences	Guelph Community Foundation	MedicAlert	Saskatchewan Indian Gaming Authority	The Lorne & Evelyn Johnson Foundation
A. Lassonde Inc.	Children's Hospital Aid Society	Home Hardware Stores Ltd.	Medisys Health Group	Saskatoon Community Foundation	The North West Company Inc.
Abbott Laboratories, Ltd.	Chippendale Foundation	Honeybush Health Ltd.	Medtronic of Canada Ltd.	Saskatoon Subway	The Poker For Diabetes Foundation
Aecon Group Inc.	CIBC	HOPE Ottawa Carleton Inc.	Merck Canada	Shaw Communications Inc.	The Toronto Star Fresh Air Fund
Affinity Credit Union	Clifford & Lily Fielding Foundation	Husky Energy Inc.	MLF Consulting Ltd.	Shopease Foods Inc.	The Toronto-Dominion Bank
Agway Metals Inc.	CMG Computer Modelling Group Ltd.	Information Services Corporation (ISC)	National Bank of Canada	Silver Hills Bakery	The Winnipeg Foundation
Amgen Canada Inc.	Community Foundation of Ottawa	Janssen Inc.	Nestlé Health Science	South Saskatchewan Community Foundation Inc.	TransCanada Pipelines Ltd.
Amor Da Patria Community Centre of Toronto	Community Initiatives Fund	Janzen's Pharmacy Ltd.	Newfound Foundation	Stickling's Specialty Bakery Ltd.	Unilever Canada Inc.
Animas Canada	Compass Pharmacies	Jarrod Oils Ltd.	Novartis Pharmaceuticals Canada Inc.	Storck Canada Inc.	Union 52 Benevolent Society
AstraZeneca Canada Inc.	Conexus Credit Union	Jewish Foundation of Manitoba	Novo Nordisk Canada Inc.	Strategic Charitable Giving Foundation	United Way Newfoundland & Labrador
Balmoral Office Group Inc.	Co-operators/CUMIS Covidien Canada	John Ung-Ling Ting Professional Corporation	Order Of The Eastern Star – Grand Chapter of NS & PEI	Subway Franchisee Advertising	Wellington Laboratories Inc.
Bayer HealthCare – Diabetes Care Division	Dauphin Clinic Pharmacy	John Zubick Ltd.	Pacific Blue Cross Health Foundation	Sudbury Rocks Running Club	Williamsburg Arms
Bayshore Home Health	Donors Choice – Killarney & Area	Johnson & Johnson Inc.	Performance Boat Club Charities	Sun Life Financial	
BD Medical – Diabetes Care	E-L Financial Corporation Ltd.	Kiwanis Club of Vancouver	Pfizer Canada Inc.	Sunrise Soya Foods	
BHP Billiton Matched Giving Program	Eli Lilly Canada Inc.	KPMG	Pharmasave Central	Sure Flow Equipment Inc.	
Blistex Corporation	Eli Lilly Canada Inc./Boehringer Ingelheim Alliance	Kraft Canada Inc.	Progressive Foods Inc.	Takeda Canada Inc.	
Boehringer Ingelheim (Canada) Ltd.	Excelleris Technologies LP	Lagniappe Foundation	Project Read Literacy Network	TD Waterhouse	
Brian & Susan Thomas Foundation	Flame Of Hope Golf Classic London	Lawson Foundation	Raymond James Canada Foundation	TELUS	
Bristol-Myers Squibb/AstraZeneca Canada Alliance	General Mills Canada Corporation	Leon's Furniture Ltd.	RBC Foundation	The Arthur J E Child Foundation	
Cal LeGrow Foundation	Genzyme Canada Inc.	LifeScan Canada Ltd.	Realty Executives Western Canada	The Calgary Foundation	
Cal Wenzel Family Foundation	GlaxoSmithKline Inc.	Lions Clubs of Canada	Regina Capital Cosmopolitan Club	The Cash Store Financial Services Inc.	
Cameco Corporation	Glenn's Helping Hand Foundation Inc.	Loblaw Companies Ltd.	Regina Queen City Kinsmen	The Charles Norcliffe Baker & Thelma Scott Baker Foundation	
Canadian Footwear Ltd.	Gold Bond Ultimate Government of Canada – Province of New Brunswick	Loyal Protestant Association	Rexall Foundation	The Chastell Foundation	
Canadian National Railway Company	Grand Court Order of The Amaranth	Manitoba Association of Health Care Professionals	Roche Diagnostics Canada	The Community Foundation of Prince Edward Island	
Canola Info/Canola Council of Canada	Great-West Life, London Life & Canada Life	Manulife Financial	Rubicon/Pharmasave	The John & Judy Bragg Family Foundation	
Cenovus Energy – Employee Foundation	Green Shield Canada	Mark's Work Wearhouse	Rx&D, Canada's Research-Based Pharmaceutical Companies	The Kinsmen Club of Saskatoon	
Chadi & Company		Masonic Foundation of Ontario	Sandra & Leo Kolber Foundation	The London & District Concrete Forming Contractors Assoc.	
		Masons	Sanofi Aventis Canada Inc.		
		McNeil Consumer Healthcare			
		Medavie Health Foundation			
		MEDEC			