

# The Cost-effectiveness of Subcutaneous Semaglutide 2.4mg Injection in the Management of Obesity in Canada Using the Core Obesity Model

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## Aim

To assess the cost-effectiveness of once-weekly subcutaneous (s.c.) semaglutide 2.4mg injection (inj.) and adjunct diet and exercise (D&E) compared with D&E alone in Canada, using the Core Obesity Model (COM) and clinical outcomes from STEP 1 and STEP 2 trials.

## Introduction

- Obesity (defined as a body mass index [BMI]  $\geq 30$  kg/m<sup>2</sup>) is one of the most significant public health issues in both developed and developing countries.<sup>1,2</sup>
- Lifestyle modification is a cornerstone of obesity management. Pharmacotherapy is usually recommended when dietary, exercise and behavioral approaches have been found to be insufficient.<sup>3</sup>
- Semaglutide 2.4 mg inj. (Wegovy<sup>®</sup>) is a long-acting glucagon-like peptide 1 receptor agonist approved for the treatment of obesity in Canada.<sup>4</sup>

## Methods

- Modelling approach:** A state-transition, Markov cohort approach was used, with health-states encompassing chronic weight-related complications such as type 2 diabetes (T2D), sleep apnea, cardiovascular disease, post-menopausal endometrial and breast cancers, colon cancer, and knee replacement surgery.<sup>5,6</sup>
- Target population:** Adults with an initial BMI of  $\geq 30$  kg/m<sup>2</sup> or  $\geq 27$  kg/m<sup>2</sup> with  $\geq 1$  weight-related comorbidity. The average starting age of the cohort was 50 years, and average BMI was 37.5 kg/m<sup>2</sup>
- At baseline, 27.6% of the cohort was assumed to have prevalent T2D, 46.4% to have prediabetes and 26% to have normal glucose-tolerance (NGT)

- Efficacy:** Percentage change vs. baseline in weight and prediabetes reversal were taken from STEP 1 (NGT and prediabetes) and STEP 2 (T2D) trials, as observed at weeks 28 and 68 and applied in cycles 2-3 and 4 of the model (Table 1).
- Changes in systolic blood pressure (SBP) and lipids were also included from the same trials.
- Perspective:** Societal, including public and private funding, patient co-pay, and indirect costs (work productivity losses).
- Discounting:** Costs and outcomes were discounted at a rate of 1.5%, as per CADTH guidelines.<sup>7</sup>
- Costs:** Costs published prior to 2021 were inflated using the consumer price index to May 2021.

**Table 1:** Change in weight vs baseline by glycemic status subgroup, and prediabetes reversal

	Sema 2.4 mg inj. Mean (SEM)	D&E Mean (SEM)
<b>Weight change (%-change vs baseline)</b>		
Subgroup NGT		
Cycle 2 & 3	- 11.8 (0.2)	-2.6 (0.3)
Cycle 4	-15.9 (0.3)	-2.4 (0.5)
Subgroup prediabetes		
Cycle 2 & 3	- 10.4 (0.2)	-2.6 (0.3)
Cycle 4	-13.7 (0.4)	-2.4 (0.5)
Subgroup T2D		
Cycle 2 & 3	-8.4 (0.2)	-2.6 (0.2)
Cycle 4	-9.6 (0.3)	-3.1 (0.3)
<b>Prediabetes reversal (%)</b>		
Cycle 2	84.1 (1.5)	47.8 (3.1)

NGT – Normal glucose tolerance; SEM – Standard error of mean; T2D – Type 2 diabetes.

- Time horizon:** 40 years, using a treatment duration of 1 year<sup>8</sup> for semaglutide 2.4 mg and 40 years for D&E applied to both arms

## Results

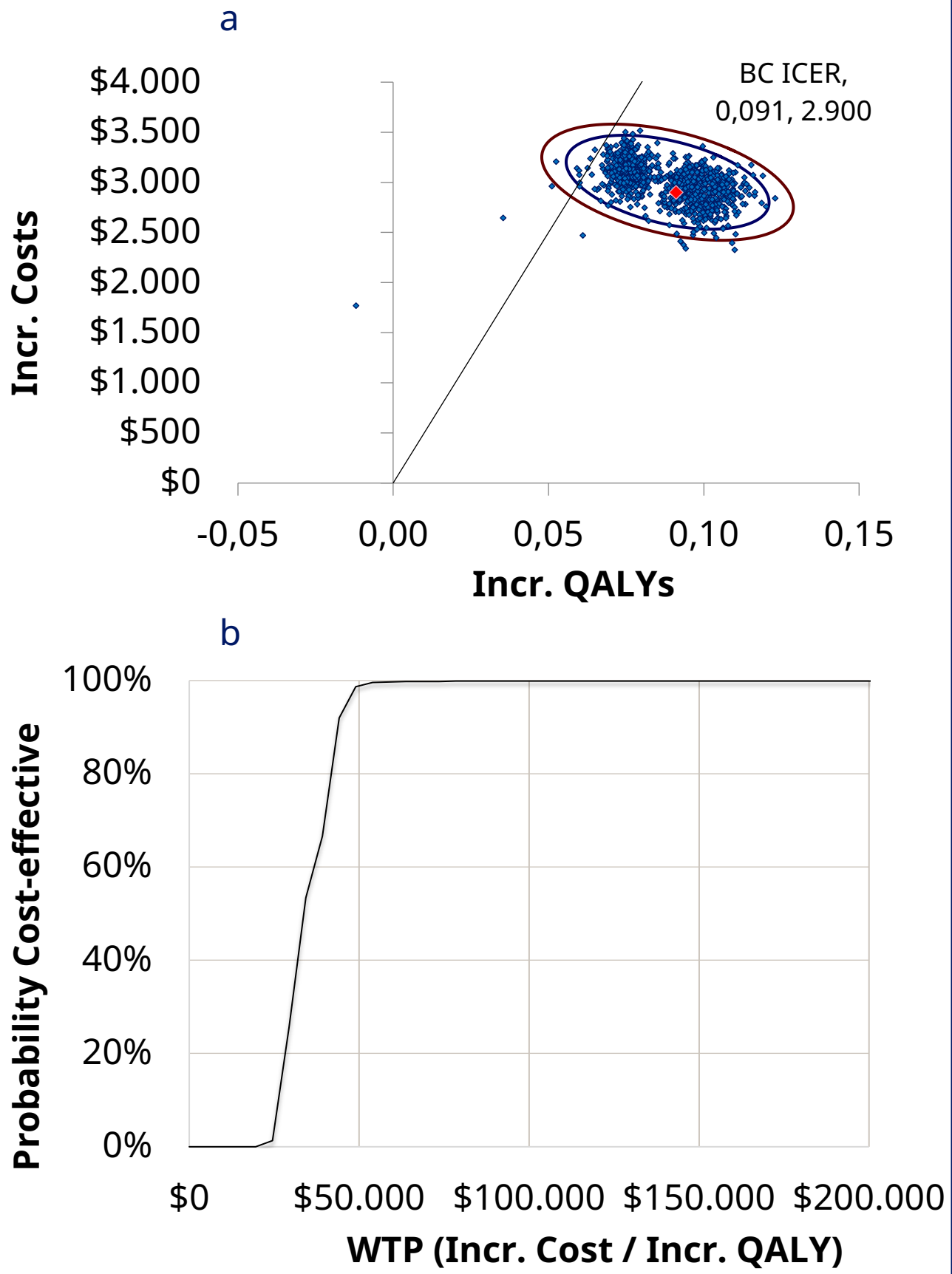
- Total per arm costs were CA\$ 239,122 and 236,221 with semaglutide 2.4mg inj. and D&E respectively
- Treatment with semaglutide resulted in higher weight loss, **higher improvement in glycemic status** and a delay in occurrence of obesity-related complications
- These benefits translated into QALY and life year (LY) gains of 0.091 and 0.07 respectively, partially compensating the additional treatment costs with semaglutide 2.4 mg and resulting in a base case incremental cost-effectiveness ratio (ICER) of CA\$ 31,861 per QALY gained (Table 2).

**Table 2:** Base case cost-effectiveness results for semaglutide 2.4 mg injection vs. D&E

	Sema 2.4 mg inj.	D&E	Incr. vs D&E
<b>Total costs (CA\$)</b>			
Obesity drugs	4,391	0	4,391
Management*	117,042	116,881	161
<b>Complications costs</b>			
Health state costs	106,983	108,584	-1,601
Events costs	10,706	10,757	-51
<b>Total QALYs</b>	<b>17.68</b>	<b>17.59</b>	<b>0.091</b>
<b>Total LYs</b>	<b>20.75</b>	<b>20.68</b>	<b>0.070</b>

\*Includes visits for obesity, D&E costs and blood pressure treatment costs. D&E – Diet and exercise; inj. – injection; LYs – Life years; QALY – Quality adjusted life.

**Figure 1:** CE Plane (a) and CE acceptability curve (b) semaglutide 2.4 mg inj. vs D&E



CE – Cost-effectiveness; Incr. - Incremental; ICER – Incremental cost-effectiveness ratio; Inj. – Injection; QALY – Quality adjusted life; WTP – Willingness to pay.

- Results were most sensitive to variations in semaglutide 2.4mg inj. treatment duration, whereby a treatment duration of 2 years increased the ICER to CA\$ 44,206 per QALY gained.

- The probabilistic analyses indicated little uncertainty with regards to the existence of additional costs and benefits with semaglutide 2.4 mg inj. when compared with D&E (Figure 1a).
- The cost-effectiveness acceptability curve showed a high likelihood (99%) for semaglutide 2.4 mg inj. to be considered cost-effective at willingness to pay (WTP) thresholds of CA\$ 50,000 per QALY gained and beyond (Figure 1b).

## Summary

- The cost-effectiveness analyses showed long-term clinical benefits, costs, and cost-effectiveness of semaglutide 2.4 mg injection in a target reimbursement population for chronic weight management in Canada (i.e., adults with BMI  $\geq 30$  kg/m<sup>2</sup> [obese] or  $\geq 27$  kg/m<sup>2</sup> [overweight] with  $\geq 1$  weight-related comorbidity).
- The analyses used results from two head-to-head trials, STEP 1 and STEP 2 of semaglutide 2.4 mg and D&E, informing the corresponding comparison.
- Costs used reflected a societal perspective.
- One year treatment with semaglutide 2.4 mg injection resulted in greater reductions in weight and higher prediabetes reversal. This was achieved at higher treatment costs, but ICER (CA\$ 31,861/QALY) remained within typically accepted WTP thresholds in Canada of 50,000 CA\$/QALY.

## Conclusion

Semaglutide 2.4 mg inj. appears to be a cost-effective treatment option for weight management in Canadians living with obesity when compared with D&E based on a WTP of CA\$ 50,000 per QALY gained.

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