

# Feasibility of an interdisciplinary program for obesity management in Canada

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## Abstract

**Objective** To assess the feasibility of a medically supervised, publicly funded interdisciplinary program for obesity management in a Canadian setting.

**Design** Retrospective chart audit using electronic medical records.

**Setting** Wharton Medical Clinic in Hamilton and Burlington, Ont.

**Participants** A total of 2739 consenting patients attending the interdisciplinary obesity-management program at Wharton Medical Clinic.

**Main outcome measures** Three- and 6-month weight changes and factors affecting weight loss.

**Results** The 1085 patients attending the clinic for at least 3 months (mean [SD] of 8.1 [6.1] visits and 5.4 [4.7] months) lost a mean (SD) of 4.2 (7.1) kg or 3.5% (6.8%) of their initial body weight, with 32% and 9% of these patients attaining weight reductions of 5% or greater and 10% or greater, respectively. The 289 patients attending the clinic for 6 months or more (mean [SD] of 13.2 [9.7] visits and 10.5 [6.9] months) lost a mean (SD) of 5.4 (10.6) kg or 4.3% (9.2%) of their initial body weight, with 47% and 17% attaining reductions of 5% or greater and 10% or greater, respectively. Visit frequency was positively associated with weight loss independent of age, sex, body mass index, and treatment duration.

**Conclusion** Preliminary data support the short-term effectiveness and clinical utility of this publicly funded program. Using this interdisciplinary model, approximately half of patients were able to attain clinically significant weight loss.

## EDITOR'S KEY POINTS

- Current guidelines recommend an interdisciplinary approach to weight management, but access to such services in the publicly funded Canadian health system is scarce. Wharton Medical Clinic is a publicly funded obesity-management program, which operates within the Ontario Health Insurance Plan in accordance with national weight-management guidelines.
- Almost half of the bariatric patients in this medically supervised obesity-management program had attained clinically significant weight reductions at 6 months. This represents a treatment success rate that is comparable to the management of other chronic conditions.
- Wharton Medical Clinic offers a potential model for obesity management for Canadian physicians in an interdisciplinary setting. Preliminary data suggest that this program is effective for short-term weight management, and the effectiveness of this program beyond 6 months will be the topic of future investigations.

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# Faisabilité d'un programme interdisciplinaire pour la prise en charge de l'obésité au Canada

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## Résumé

**Objectif** Évaluer la faisabilité d'un programme interdisciplinaire financé par le secteur public et sous la supervision de médecins pour la prise en charge de l'obésité dans un milieu canadien.

**Conception** Vérification rétrospective de dossiers à l'aide de dossiers médicaux électroniques.

**Contexte** Clinique médicale Wharton à Hamilton et à Burlington, en Ontario.

**Participants** Un groupe de 2739 patients ayant consenti à l'étude et suivant un programme interdisciplinaire de prise en charge de l'obésité à la Clinique médicale Wharton.

**Principaux paramètres à l'étude** Changements dans le poids après 3 et 6 mois et facteurs influençant la perte de poids.

**Résultats** Les 1085 patients qui ont participé à la clinique pendant au moins 3 mois (moyenne [DS] de 8,1 [6,1] visites et de 5,4 [4,7] mois) ont perdu en moyenne (DS) 4,2 (7,1) kg ou 3,5 % (6,8 %) de leur poids corporel initial. De plus, 32 % et 9 % de ces patients ont atteint respectivement des réductions de poids de 5 % ou plus et de 10 % ou plus. Les 289 patients qui ont participé à la clinique pendant 6 mois ou plus (moyenne [DS] de 13,2 [9,7] visites et de 10,5 [6,9] mois) ont perdu en moyenne (DS) 5,4 (10,6) kg ou 4,3 % (9,2 %) de leur poids corporel initial. En outre, 47 % et 17 % ont atteint respectivement des réductions de 5 % ou plus et de 10 % ou plus. La fréquence des visites était associée positivement avec la perte de poids, quels que soient l'âge, le sexe, l'indice de masse corporelle et la durée du traitement.

**Conclusion** Des données préliminaires corroborent l'efficacité à court terme et l'utilité clinique de ce programme financé par le secteur public. À l'aide de ce modèle interdisciplinaire, environ la moitié des patients ont pu atteindre une perte de poids significative sur le plan clinique.

## POINTS DE REPÈRE DU RÉDACTEUR

- Les guides de pratique actuels recommandent une approche interdisciplinaire à la prise en charge du poids, mais l'accès à de tels services dans le système de santé public canadien est restreint. La Clinique médicale Wharton est un programme de prise en charge de l'obésité, financé à même les fonds publics, et administré dans le contexte du Régime d'assurance-maladie de l'Ontario, conformément aux lignes directrices nationales sur la prise en charge du poids.
- Près de la moitié des patients obèses dans ce programme de prise en charge du poids supervisé par des médecins avaient atteint des réductions de poids significatives sur le plan clinique après 6 mois. Ceci représente un taux de réussite comparable à celui obtenu dans la prise en charge d'autres maladies chroniques.
- La Clinique médicale Wharton offre un modèle potentiel à suivre pour la prise en charge de l'obésité par des médecins canadiens dans un contexte interdisciplinaire. Les données préliminaires font valoir que ce programme est efficace dans la prise en charge du poids à court terme et l'efficacité de ce programme au-delà de 6 mois fera l'objet d'études subséquentes.

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An estimated 59% of the adult Canadian population is overweight, with 23% being obese.<sup>1</sup> Weight reductions of 5% to 10% can improve hemodynamic and metabolic health and have accordingly been established as the clinical goal for weight loss.<sup>1,2</sup> Evidence suggests that medically supervised programs might increase the likelihood of weight loss,<sup>3</sup> and it is often observed that more patient contact is associated with greater weight losses,<sup>3-6</sup> suggesting that obesity can be successfully managed by physicians. Although physicians commonly encounter obesity in their practices,<sup>7</sup> they often cite lack of time<sup>8-10</sup> or training<sup>11-13</sup> as barriers to adequately treating the condition. This might drive patients to seek weight loss through commercial programs, which are associated with high consumer costs and high attrition rates.<sup>14</sup> It is possible that these issues could be addressed by using interdisciplinary teams within the existing public system, which could allow for frequent and multifaceted treatment, as well as the provision of obesity-management services to individuals free of charge. Unfortunately, reports of the effectiveness of such programs are scarce in the literature.<sup>1</sup> Therefore, the purpose of this study was to describe the short-term weight loss, and factors associated with weight loss and discontinuation of treatment, among a sample of patients from a medically supervised interdisciplinary obesity-management program.

## METHODS

### Intervention

The Wharton Medical Clinic (WMC) is an interdisciplinary bariatric clinic located in Hamilton and Burlington, Ont, which includes a team of physicians, behavioural therapists, dietitians, and nutritionists. The clinic operates under principles outlined in the Canadian clinical practice guidelines for the treatment of obesity,<sup>1</sup> which recommend dietary, exercise, and behavioural interventions for weight loss, with meal replacement, pharmacotherapy, and surgery as adjunct therapies when indicated. Patient visits consist of services charged to the Ontario Health Insurance Plan, including physician visits, calorimetry, and diagnostic testing such as blood work and electrocardiography. Complementary services (drop-in visits in which patients weigh themselves and educational sessions) that are not charged to the Ontario Health Insurance Plan or to patients are also offered to allow for greater patient contact without increasing the cost to the health care system. As obesity is a chronic, relapsing medical condition, there is no defined program length. All patients are referred by family physicians or other specialists. **Figure 1** illustrates the various components of the program.

**First visit.** Patients complete a questionnaire on behavioural goals, and medical, social, psychological, physical activity, diet, and weight loss history. Anthropometric measures (height, weight, and waist circumference) are assessed using standardized methods<sup>1</sup> by a trained technician. All patients undergo electrocardiography, calorimetry, and standard bloodwork at baseline.<sup>1</sup> A bariatric educator (with a university degree in nutrition) guides the patient through a 20-minute educational session on nutrition and outlines program expectations. The physician then identifies and treats causative factors, complications, and comorbidities associated with obesity; helps patients set realistic goals; and determines the appropriate combination of treatments.

**Subsequent visits.** After the initial consultation, patients are in regular contact with the physician and bariatric educator (ie, once or twice monthly), and body weight is assessed at subsequent visits to track weight changes. Under the guidance of the physician, the bariatric educator provides 20 minutes of weight-management education and monitored individualized weight-management strategies for weight loss. The physician manages underlying causative factors and comorbidities at each visit, as appropriate. Patients are encouraged to come to the clinic weekly for unscheduled visits to weigh themselves.

**Educational workshops.** Patients are required to attend educational sessions administered by physicians, dietitians, behavioural therapists, and exercise specialists. Examples of sessions include “Emotional Eating” and “How to Exercise at the Appropriate Level.”

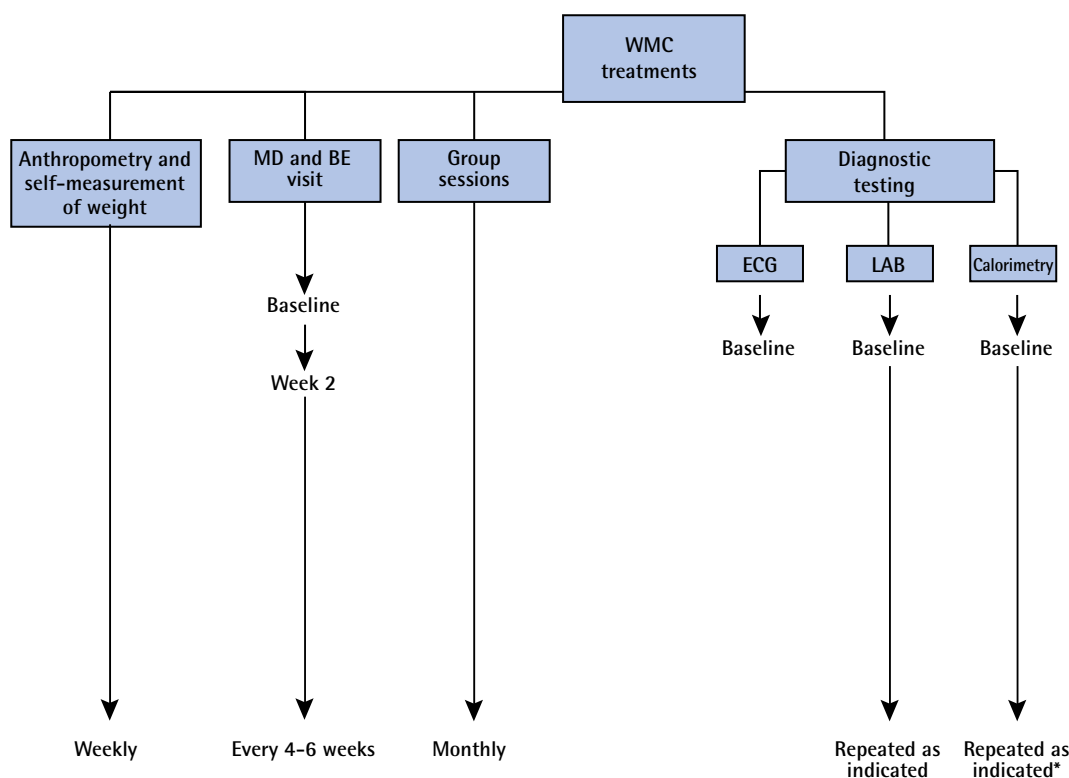
### Recruitment and ethics

As of August 2009, patients indicated whether they were willing to consent to the use of their electronic medical data for research purposes and were informed that their participation or lack of participation would not alter treatment. Sixty percent of patients provided written informed consent for participation in this research, providing a sample of 2739 patients. The methods used were approved by the York University Institutional Review Board.

### Assessment

Patients were weighed in lightweight clothing without shoes using standard methods and a high-capacity platform scale operated by trained staff. Weight loss (dependent variable) was calculated as the last observed body weight minus the first observed body weight.

Discontinuation of the program (dependent variable) was characterized as not attending the clinic for longer than 3 months after the last visit. Treatment duration in months (independent variable) was defined by how

**Figure 1. Wharton Medical Clinic treatment algorithm**

BE—bariatric educator, ECG—electrocardiography, LAB—laboratory measures (including blood work and urinalysis), MD—medical doctor, WMC—Wharton Medical Clinic.

\*Reassessed if fluctuations in metabolic rate indicated by weight loss or changes in intake.

long participants attended the clinic, and visit frequency (independent variable) was characterized as the number of participant visits during the study period.

## Statistical methods

Continuous variables are reported as means and SDs, and categorical variables are presented as frequencies and prevalences. Pearson correlations and linear regression were used to determine the association between weight loss, treatment duration, and visit frequency adjusting for age, sex, and initial body mass index (BMI). Logistic regression was used to determine factors associated with discontinuation of the program. All analyses were conducted using SAS 9.2.

## RESULTS

The baseline characteristics for the 2739 participants are presented in **Table 1**. Patients frequently reported hypertension (45%), hypercholesterolemia or hyperlipidemia (33%), and type 2 diabetes (21%), risk factors that are important considerations in obesity management.<sup>1</sup>

**Table 2** compares outcomes for all participants with those for participants attending the clinic for at least 3 months and at least 6 months. Among the entire

**Table 1. Participant characteristics: N = 2739.**

PARAMETER	VALUE
Mean (SD) age, y	49.3 (12.5)
Mean (SD) weight, kg	111.8 (25.7)
Mean (SD) body mass index, kg/m <sup>2</sup>	40.6 (8.1)
Mean (SD) waist circumference, cm	121.5 (40.1)
Female, %	77.6
Current smoker, %	15.0
Previous smoker, %	36.4
Hypertension, %	45.0
Hypercholesterolemia or hyperlipidemia, %	32.8
Arthritis, %	27.0
Depression, %	27.0
Type 2 diabetes, %	21.2
Anxiety, %	12.0
Cardiovascular disease, %	2.0

sample, patients lost a mean (SD) of 2.5 (4.6) kg overall. Seventeen percent of patients attained a weight loss of 5% or greater, and 4% attained a weight loss of 10% or greater. Patients required a mean (SD) of 9.7 (7.4) visits and 5.4 (4.4) months to attain a 5% weight loss, and 12.2 (9.0) visits and 7.0 (5.5) months to achieve a 10% weight loss. **Figure 2** illustrates the increasing number of patients attaining weight reductions of 5% and 10% over time. Participants who attended the clinic for at least 3 months had a mean (SD) weight loss of 4.2 (7.1) kg, with 32% and 9% of these participants attaining 5% and 10% weight reductions, respectively. Participants who attended the clinic for at least 6 months had a mean (SD) weight loss of 5.4 (10.6) kg, with 47% and 17% of these

participants attaining weight reductions of 5% and 10%, respectively. Weight loss correlated with both treatment duration (Pearson  $r=0.60$ ,  $P<.001$ ) and visit frequency (Pearson  $r=0.30$ ,  $P<.001$ ). Greater visit frequency was also positively associated with weight loss, independent of age, sex, initial BMI, and treatment duration (Pearson  $r=0.32$ ,  $P<.001$ ), such that every additional visit was associated with an additional 0.3-kg weight loss in the first 3 months and a 0.4-kg weight loss thereafter.

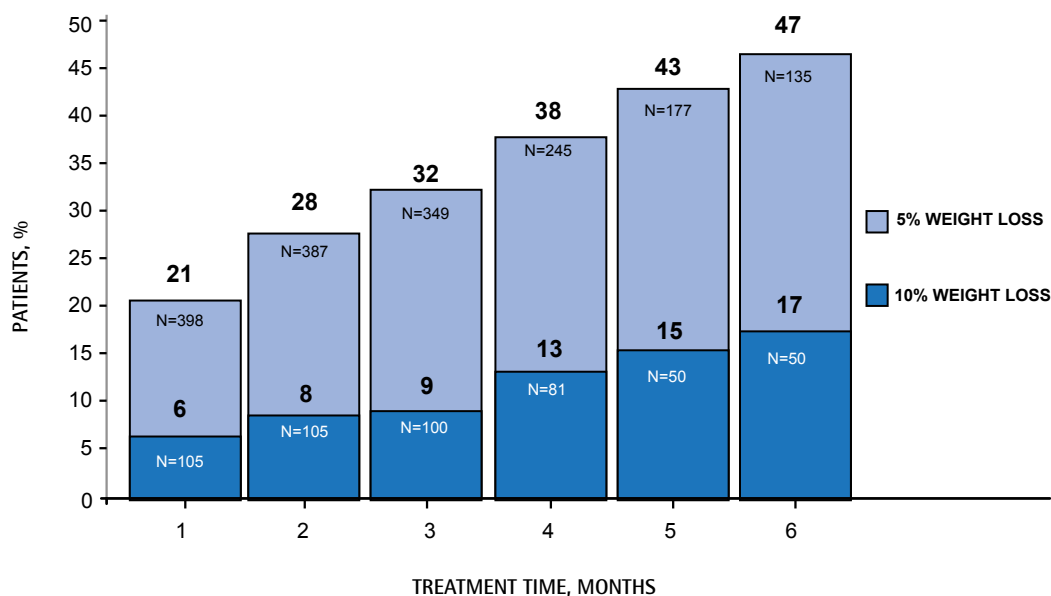
A total of 15.2% ( $n=417$ ) of participants discontinued treatment, with 14.5% ( $n=397$ ) discontinuing treatment with the first 3 months. These participants lost a mean (SD) of 0.9 (1.9) kg (range of weight change -8.5 to 9.2 kg) or 0.8% (1.8%) of their initial body weight (range -6.9%

**Table 2. Participant outcomes**

MEASUREMENTS	ALL PARTICIPANTS, N=2739	PARTICIPANTS ATTENDING THE CLINIC FOR AT LEAST 3 MO, N=1085	PARTICIPANTS ATTENDING THE CLINIC FOR AT LEAST 6 MO, N=289
Mean (SD) weight loss, kg	2.5 (4.6)	4.2 (7.1)	5.4 (10.6)
Mean (SD) weight loss, % of initial body weight	2.3 (4.0)	3.5 (6.8)	4.3 (9.2)
Mean (SD) no. of mo attending the clinic	3.0 (4.0)*	5.4 (4.7)	10.5 (6.9)
Mean (SD) no. of visits	5.0 (4.8)*	8.1 (6.1)	13.2 (9.7)
Attained weight loss $\geq 5\%$ of initial body weight, %	17	32	47
Attained weight loss $\geq 10\%$ of initial body weight, %	4	9	17

NA—not applicable.  
\*Participants attended the clinic for between 0 and 35 months (1 to 79 visits).

**Figure 2. Proportion of patients attaining 5% or 10% weight loss by treatment time:**  
*Light and dark blue indicate 5% and 10% weight loss, respectively.*



to 10.1%), and had attended 3.5 (1.5) visits over 1.0 (1.1) months (range 2 to 14 visits over 0 to 11 months). These patients were significantly younger (46.2 years of age vs 49.9 years of age,  $P < .001$ ) but did not differ in terms of initial BMI (40.5 vs 40.5 kg/m<sup>2</sup>,  $P > .05$ ) or smoking status ( $P > .05$ ) from those continuing treatment. Women were 27% less likely to discontinue treatment than men were (odds ratio 0.73, 95% CI 0.56 to 0.95).

## DISCUSSION

The WMC provides a real-life example of how obesity can be managed by Canadian physicians within the public health care system. Using this model, a considerable proportion of patients was able to attain clinically significant weight loss during the observation period. Clinically significant weight loss is defined as weight loss of 5% or more of the initial body weight.<sup>1,2</sup> One-third of participants were able to lose this amount of weight in the first 3 months of treatment, and the frequency of participant contact modestly correlated with increased weight loss, such that almost 50% of participants attained 5% weight reductions by 6 months. Importantly, visit frequency correlated with weight loss independent of treatment duration, suggesting that patients attending the clinic for the same amount of time might lose more weight if they visited the clinic more often. Greater participant contact has similarly been reported to improve hypertension management<sup>15</sup> and smoking cessation,<sup>16</sup> perhaps owing to regular treatment and encouragement from health care professionals.<sup>3</sup> This suggests that a model of obesity care that allows for frequent contact could improve treatment outcomes.

Although several medical weight-management clinics exist in Canada, details surrounding their structure and effectiveness are scarce in the literature. One program that has been described is that of the UETRO (Unité d'enseignement, de traitement et de recherche sur l'obésité) outpatient clinic, which had an interdisciplinary team including a nurse, a nutritionist, a psychologist, a kinesiologist, a pharmacist, and an endocrinologist.<sup>17</sup> Similar to WMC, UETRO included lifestyle interventions and educational sessions, but they reported a smaller weight loss at 6 months than WMC among participants completing the year-long program (1.8% vs 5.4% weight loss). Compared with many randomized controlled trials of weight loss interventions, WMC reports smaller reductions after 6 months (7% to 10% vs 5.4%, respectively).<sup>18</sup> However, such trials also have greater participant contact and are funded by research grants, making it difficult to determine whether the interventions would be economically sustainable. Theoretically, if WMC participants maintained weekly contact, a comparable reduction of 8.8% would be expected after 6 months, and the

likelihood of participants attaining clinically significant weight loss would be increased. As with many other chronic conditions, clinical goals and treatment outcomes for obesity management might not bring patients to "normal" levels. For example, the clinical goals for hypercholesterolemia and hyperlipidemia,<sup>19</sup> hypertension,<sup>20</sup> and type 2 diabetes<sup>21,22</sup> management do not return patients to levels observed in individuals without the conditions. In fact, up to two-thirds of patients are unable to meet clinical goal targets,<sup>20,22,23</sup> highlighting the difficulty in managing chronic conditions. Thus, the proportion of participants achieving the targets of 5% to 10% weight loss at the WMC appears to be comparable with successes in the management of other metabolic conditions.

## Strengths and limitations

The WMC is a potential model for a large community-based weight-management program within the public Canadian health care system. Preliminary data suggest that this program is effective for short-term weight management, and the effectiveness of this program beyond 6 months will be the topic of future investigations. It is important to consider that the WMC is a referral-based clinic, and these participants might be more concerned about their health and more motivated to lose weight than the general patient population is. Additionally, as causal relationships between treatment time or visit frequency and weight loss cannot be determined, it is plausible that successful weight loss might have encouraged greater patient participation. With an observational trial such as this, it is also impossible to determine why individuals discontinue treatment and whether a targeted intervention might further improve outcomes.

## Lessons learned

An important component of the WMC weight-management program are the bariatric educators (nutritionists) who provide education and dietary support, thus allowing the physician to focus on treating health conditions. The decision to engage nutritionists rather than registered dietitians in the program was based on the fact that although dietitians are highly qualified health professionals, their continuing engagement in a high-intensity program requiring ongoing follow-up visits is limited by availability and cost. In contrast, as demonstrated in this paper, bariatric educators, under the guidance of a physician, can provide an economical and effective approach to routine weight management in uncomplicated patients. However, the physician must have experience with weight-management treatments, including pre-operative and postoperative care, nutrition guidelines, physical activity recommendations, and managing comorbidities. Given the important relationship between frequency of follow-up visits and maintenance of weight



loss, it appears prudent to offer self-directed walk-in weigh-in sessions in an unthreatening environment, which increases patient contact with the clinic and serves as a regular reinforcement of behavioural change.

## Conclusion

This paper describes a possible model for an effective and feasible obesity-management program within the publicly funded health care system. The interdisciplinary approach involving frequent patient contact and patient education can result in clinically relevant weight loss in a substantial number of patients. Similar specialized centres within the Canadian health care system might be useful in the management of obesity.

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## Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

## Competing interests

**Dr Wharton** is Medical Director, **Ms VanderLelie** is Program Coordinator, and **Saaqshi Sharma** held a 6-month internship at Wharton Medical Clinic. **Dr Kuk** holds a research grant from Wharton Medical Clinic.

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