Scientific research has discovered that physiological responses to weight loss trigger weight regain

Weight loss in people with obesity has been shown to cause a change in the levels of their appetite hormones—increasing hunger and the desire to eat for at least 1 year[21]

Multiple hormones, such as ghrelin, GLP-1, and leptin, play an important role in regulating appetite.[5]

The brain plays a central role in regulating appetite and energy balance.[5] Metabolic adaptations that occur in response to weight loss include:[21–24]

Increased desire to eat ← → Increased hunger

Hunger hormones

Satiety hormones

Energy intake

Energy expenditure

Obesity is not caused by a lack of willpower or motivation. Physiological factors, including changes in the appetite hormones that favour weight regain, may be one of the challenges people living with obesity or overweight face after weight loss.[15,21]

Adapted from Sumithran P, et al. (2011); Schwartz A, et al. (2010); Sumithran P, et al. (2013).

GLP-1, *glucagon-like peptide-1.*

Canadian guidelines for obesity management[15]

What is the current approach to obesity management?

For your patients, an approach for the long-term management of obesity may involve a combination of treatments:

- Behavioural modifications
  - Nutrition
  - Physical activity
  - Cognitive-behaviour therapy

- Pharmacotherapy (in combination with lifestyle modifications)
  - For patients with BMI ≥ 27 kg/m^2 with risk factors or BMI ≥ 30 kg/m^2
  - Consider if the patient has not lost 0.5 kg (1lb) per week by 3–6 months after lifestyle changes

- Bariatric surgery (in combination with lifestyle modifications)
  - BMI ≥ 35 kg/m^2 with risk factors or BMI ≥ 40 kg/m^2
  - Consider if other weight loss attempts have failed (requires lifelong medical monitoring)
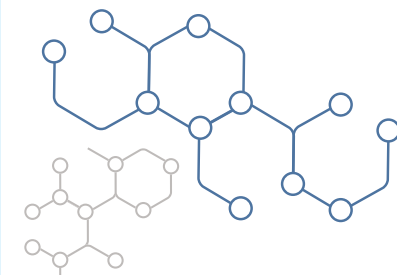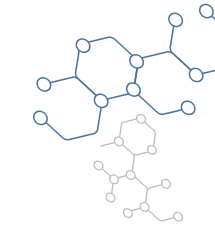
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Obesity is a chronic disease that requires long-term management

"It is important for healthcare providers to recognize obesity as a disease so preventive measures can be put in place and patients can receive the appropriate treatment."[1]
—**CMA** (Canadian Medical Association)

"Obesity is a chronic and often progressive condition not unlike diabetes or hypertension."[2]
—**Obesity Canada**

"[Obesity] must be viewed as a chronic disorder that essentially requires perpetual care, support, and follow-up."[3]
—**AACE** (American Association of Clinical Endocrinologists)

Obesity is a complex, chronic medical condition that is influenced by multiple factors including:[4,5]
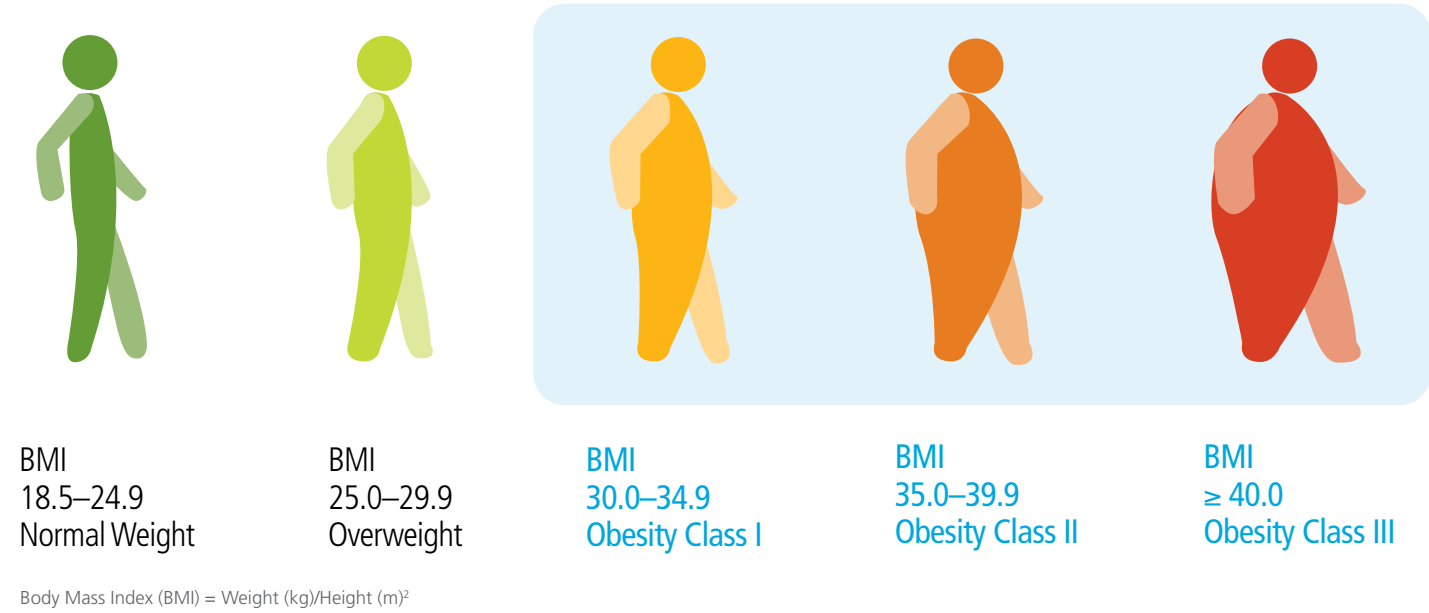
- Genetics
- Physiological responses
- Environment
- Behaviour

Obesity is highly prevalent in Canada

- **3-fold** increase in self-reported prevalence from 1985[6]

- **1 in 4** Canadian adults were obese as of 2013[7]

- **1 in 9** Canadian adults had class II or III obesity (BMI ≥ 35 kg/m^2) as of 2013[7]

How do we classify obesity?

Obesity Class (I–III) is based on BMI and is a measure of height relative to weight.[2]

BMI
18.5–24.9
Normal Weight

BMI
25.0–29.9
Overweight

BMI
30.0–34.9
Obesity Class I

BMI
35.0–39.9
Obesity Class II

BMI
≥ 40.0
Obesity Class III

Body Mass Index (BMI) = Weight (kg)/Height (m)^2

Obesity Stage (Edmonton Obesity Staging System, EOSS) is based on the medical, mental, and functional impact of obesity and is a measure of how healthy the person is.[2]

Stage 4: End-Stage
Stage 3: End-Organ Damage
Stage 2: Established Co-Morbidity
Stage 1: Preclinical Risk Factors
Stage 0: No Apparent Risk Factors

Adapted from Obesity Canada.

BMI is a measure of a person's size. To determine a person's overall health, the EOSS helps clinicians grade obesity based on simple criteria obtained from a patient's medical history, physical examination, and standard diagnostic tests.[8]

The weight of obesity on Canadians

Obesity is a complex, multifactorial disease with a substantial personal impact

Life expectancy decreases with increasing BMI
Compared to a person living with overweight, class I obesity is associated with:[9]

• 60–120% increased diabetic, renal, and hepatic mortality
• 40% increased vascular mortality
• 20% increased respiratory mortality

An estimated 10,648 premature deaths occurred in Canada in 2011 as a direct consequence of obesity.[10]

Compared to a woman aged 20–39 with a normal BMI (18.5–24.9 kg/m^2), a women's predicted lifespan is:[11]

5.6 years less
with class I obesity (BMI of 30–35 kg/m^2)
6.1 years less
with class II–III obesity (BMI ≥ 35 kg/m^2)

Compared to a man aged 20–39 with a normal BMI (18.5–24.9 kg/m^2), a man's predicted lifespan is:[11]

5.9 years less
with class I obesity (BMI of 30–35 kg/m^2)
8.4 years less
with class II–III obesity (BMI ≥ 35 kg/m^2)

Adapted from Grover SA, et al. Estimation of the years of life lost for people with class I, II, or III obesity compared to people with a normal BMI (18.5–25 kg/m^2) based on a disease-simulation model. Data are based on cardiometabolic risk factors in US adults in the National Health Examinations and Nutrition Survey data from 2003–2010.

Studies have shown various health consequences of class II obesity:[12–14]

A
5–8 times
greater prevalence of type 2 diabetes[12]

B
2-fold
greater prevalence of hypertension[12]

C
2–3 times
greater prevalence of coronary heart disease[12]

D
1.3 times
greater prevalence of dyslipidemia[12]

E
5-fold
greater risk of major depression[13]

F
> 17 times
greater prevalence of sleep apnea[14]

G
2–3 times
greater prevalence of osteoarthritis[12]

Multiple chronic diseases are associated with obesity.[15]

Obesity and its complications have a significant burden on people with obesity and can affect their families and their caregivers.

Substantial benefits have been associated with weight loss

"The first goal is to **STABILIZE** weight and **PREVENT** further weight gain. Substantial health benefits have been seen with **MODEST** (5–10%) weight loss."[2]
—Obesity Canada

Weight loss in people living with obesity

Example:
Female
Age: 40
Height: 168 cm

	Start	3% lost	5% to 10% lost
Weight	90 kg	87.3 kg	85.5 kg to 81 kg
Lost*	–	2.7 kg	4.5 kg to 9 kg
BMI	31.8	30.9	30.2 to 28.6

Increased risk of obesity-related conditions.

Some health benefits may occur.

Reduced risk of certain diseases.† Improvements in physical QoL.

* Weight lost from start.
† Diabetes, cardiovascular.
Example for illustrative purposes only.

The potential health benefits of 5–10% weight loss include:

• **58% reduction in the risk of developing type 2 diabetes**[16]
• **Improved glycemic control**[17]
   ○ 0.5% reduction in A1C[18]
   ○ 1.1 mmol/L reduction in fasting blood glucose[18]
• **Reduced blood pressure**[17]
• **Reduced cholesterol levels**[17]
• **30% decrease in sleep apnea symptoms**[19]
   ○ Reduced frequency of sleep apnea, improved sleep quality, and reduced daytime somnolence[17]
• **Improved health-related quality of life (HRQoL)** in people living with obesity, particularly physical aspects[20]
• **Alleviated osteoarthritis, and back and joint pain**[17]
• **Improved lung function and breathlessness**[17]

QoL, quality of life.