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# Obesity – the new epidemic

By Michelle Eidness, BSP



## Statement of objectives

Upon completion of this lesson, the pharmacy technician will be able to:

1. List the health risks of obesity
2. Help a patient determine if they are underweight, normal weight, overweight or obese
3. Describe the benefits of attaining and maintaining a healthy weight
4. Discuss over-the-counter products and non-pharmacologic options to aid weight loss

## Introduction

Obesity has become the most prevalent nutritional problem in the world over the last 20 years.<sup>1</sup> The increase of obesity has occurred in all segments of society, regardless of sex, race, age or education level. The prevalence of overweight children is especially alarming. Since obesity is a major contributor to many preventable causes of death, the importance of controlling it cannot be overstated. The pharmacy team is in an ideal position to provide information on the risks associated with obesity and education and support for weight loss efforts. This lesson reviews the consequences of obesity and discusses the effectiveness and adverse effects of over-the-counter (OTC) treatments as well as nonpharmacological management.

## Facts about obesity

In historical times, obesity was a symbol of wealth and prosperity. Most societies now consider it to be undesirable. The World Health Organization's statistics indicate that globally

in 2005, approximately 1.6 billion adults (age 15+) were overweight, and at least 400 million adults were obese (definitions for these terms appear under "Measuring Obesity" below).<sup>2</sup> The World Health Organization projects that by 2015 approximately 2.3 billion adults will be overweight and more than 700 million will be obese.<sup>2</sup> In addition, at least 20 million children under the age of 5 years were overweight globally in 2005.<sup>2</sup> In Canada, the problem of obesity among children and adolescents is advancing at an even more rapid pace than obesity in adults. The 2004 Canadian Community Health Survey showed increases in the obesity rate from 2% to 10% among boys and from 2% to 9% in girls aged 2–17 years.<sup>1</sup> This survey showed that 59% of the adult population is overweight and 1 in 4 (23%) adults is obese.<sup>1</sup>

## Health risks of obesity

Obesity is correlated with a higher risk of developing a variety of serious diseases and conditions including:

1. Coronary artery disease
2. Hypertension
3. Pulmonary embolism
4. Varicose veins
5. Gall bladder disease
6. Gastroesophageal reflux disease
7. Breast, colon and endometrial cancer
8. Liver abnormalities
9. Hernias
10. Nonalcoholic fatty liver disease
11. Cellulitis
12. Carbuncles (type of abscess)
13. Hygiene problems and inflammation of the body folds
14. Venous stasis of legs
15. Immobility
16. Low back pain
17. Osteoarthritis
18. Hypogonadism
19. Urinary stress incontinence
20. Idiopathic intracranial hypertension
21. Pain, burning, or numbness over the outer thigh
22. Stroke
23. Depression and suicidal ideation
24. Social and employment discrimination
25. Work disability
26. Low self-esteem
27. Shortness of breath and fatigue
28. Sleep apnea<sup>1,2,3</sup>

Approximately 1 in 10 premature deaths among Canadian adults 20–64 years of age may be directly attributable to overweight and obesity.<sup>1</sup>

### Measuring obesity

Body mass index (BMI) and waist circumference are tools that are used by health professionals to help determine if a patient is at risk of developing health problems associated with being overweight. BMI is a ratio of weight to height and is calculated by dividing the patient's weight (in kg) by their height (in meters squared). There are four categories of BMI in the Canadian weight classification system:

1. Underweight (BMI < 18.5kg/m<sup>2</sup>)
2. Normal weight (BMI 18.5–24.9kg/m<sup>2</sup>)
3. Overweight (BMI 25–29.9kg/m<sup>2</sup>)
4. Obese (BMI 30 or over)<sup>1,2,3</sup>

Waist circumference is the second indicator of health risk associated with abdominal obesity. Excess fat around the waist and upper body (also described as an “apple” body shape) is associated with greater health risk than fat located more in the hip and thigh areas (described as a

“pear” body shape).<sup>4</sup> A waist circumference measurement of 102 cm (40 in) or more for men, and 88 cm (35 in) or more for women, is associated with an increased risk of developing health problems.<sup>3,4</sup> Since the cut-off points are approximate, a waist circumference just below these measurements should also signal concern. In general, the risk of developing health problems increases as waist circumference measurement increases above the cut-off points.<sup>3</sup>

Both of these tools can be used with adults age 18 years and over, with the exception of pregnant and breastfeeding women. These measurements may underestimate or overestimate health risks in certain adults, such as highly muscular adults, adults who have a very lean body build, young adults who have not reached full growth and adults over 65 years of age.<sup>3,4</sup> Several studies are looking at developing indicators to help determine risk in children and adolescents given the rising prevalence of obesity in this age group. In the meantime, children and adolescents should be referred to their physician and discouraged from using OTC products for weight loss.

### What causes obesity and overweight?

The fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended. Global increases in the number of people who are overweight or obese can be attributed to a number of factors including the global shift in diet towards increased intake of energy-dense foods that are high in fat and sugars, and a trend towards decreased physical activity.<sup>2</sup>

### Lifestyle measures to aid in weight loss

Overweight and obesity, as well as their related chronic diseases, are largely preventable. At the individual level, people can:

- Achieve energy balance and a healthy weight. The 2006 Canadian obesity guidelines suggest that patients should aim for a 5–10% weight loss or 0.5–1kg (1–2lb) per week for 6 months by reducing energy intake by 500–1000kcal/day.<sup>1</sup>
- Limit energy intake from total fats and

shift fat consumption away from saturated fats to unsaturated fats.

- Increase consumption of fruits and vegetables, as well as legumes, whole grains and nuts.
- Limit the intake of sugars.
- Increase physical activity—at least 30 minutes of regular, moderate-intensity activity on most days.<sup>1,2</sup>
- Fad diets should be avoided since some are harmful and the results don't last once the individual returns to a normal diet.<sup>3</sup>

### Fad diets

Many diets are promoted for weight loss. There is evidence to confirm that reducing energy intake to 1200–1500kcal/day will cause a loss of body weight and adipose tissue.<sup>1</sup> However, there is not enough evidence to conclude that changing to either a low-carbohydrate intake, high protein, or a low-fat intake offers any advantage compared to just reducing caloric intake by 500kcal/day.<sup>1</sup> The Canadian obesity guidelines suggest that a high-protein or a low-fat diet (within acceptable macronutrient distribution ranges) is a reasonable short-term (6–12 months) treatment option for obese adults as part of a weight-loss plan. The guidelines also strongly recommend that the optimal dietary plan for achieving healthy body weight be developed with the help of a qualified health professional to ensure that any diet followed meets all of the individual's nutritional requirements (such as fiber) and does not exceed recommendations in areas such as cholesterol.<sup>1</sup>

### Nonprescription products available to aid in weight loss

Three groups of products are available for consumers to purchase to aid in weight loss: meal replacement products, minerals and herbal products.

**Meal replacement products** have the primary use of reducing caloric intake. The premise is that replacing a meal with a meal replacement product will produce weight loss by decreasing the number of calories consumed each day. A systematic evaluation of randomized controlled trials utilizing meal replacement products for weight management suggests that these types of interventions can safely and effectively produce significant, sustainable

weight loss and improve weight-related risk factors of disease.<sup>6</sup> A second study of a variety of ready-to-eat cereal products concluded that they may be used safely and effectively as meal replacements in weight-loss programs.<sup>7</sup> The 2006 Canadian obesity guidelines state that meal replacements may be considered as a component of an energy-reduced diet for selected adults commencing a dietary weight-loss program.<sup>1</sup>

**Minerals:** Two minerals have been purported to aid in weight loss: calcium and chromium. Increasing calcium consumption from dairy products may increase weight reduction and lean body mass, and decrease body fat.<sup>8</sup> Some evidence suggests that increasing calcium consumption by 900-1000 mg per day is associated with an 8-9 kg reduction in body weight compared to consuming less calcium.<sup>8,9</sup> For every 300 mg increment of calcium consumed, there is an associated weight loss of 2.5 to 3 kg.<sup>8,9</sup>

There is contradictory evidence about the effect of chromium on weight. Some evidence shows that chromium picolinate produces modest weight loss of about 1.1 kg compared to placebo over 72-90 days, but other studies haven't found this benefit.<sup>10,11</sup>

**Herbal products:** Both the National Heart, Lung, and Blood Institute and the Canadian clinical practice guidelines on obesity do not recommend the use of herbal products as an effective means of weight control since there is insufficient evidence to recommend in favour of or against their use.<sup>1,12</sup> However, some of the supplements currently available show promise for use in weight loss and weight maintenance when combined with caloric reduction and increased exercise. The herbal products sold as weight loss agents fall into four categories: appetite suppressants, thermogenic agents, digestion inhibitors and miscellaneous agents.

**Appetite suppressants** include ginkgo biloba, 5-hydroxytryptophan (5-HTP), hoodia and St. John's wort. They are theorized to work on the central nervous system to decrease appetite or cause a feeling of fullness.<sup>8,11</sup> No reliable evidence exists that this group of products helps to reduce weight in obese patients. Advise patients against taking 5-HTP since cases

of eosinophilia myalgia syndrome have been associated with its use.<sup>8</sup>

**Thermogenic agents** increase energy expenditure. Herbal products in this group include bitter orange, caffeine, cayenne, and ephedra (also called ma huang).<sup>8,11</sup> The ephedra plant naturally contains ephedrine, phenylpropanolamine, and pseudoephedrine. Ephedrine increases the release of norepinephrine, which decreases appetite.<sup>8</sup> Ephedrine also increases heart rate, blood pressure, and energy expenditure.<sup>8</sup> Bitter orange contains a product related to ephedrine, called synephrine, which effects are similar to ephedrine.<sup>8</sup> A recent meta-analysis of 52 trials and 65 case reports showed that ephedrine, alone or in combination with caffeine, promoted modest weight loss (0.6kg-1kg/month).<sup>1</sup> However, it increased the risk of psychiatric disorders, palpitation and gastrointestinal symptoms 2.2-3.6 fold.<sup>1</sup> Caution should be emphasized in patients with high blood pressure or heart disease who would like to use these products.<sup>8</sup> (Further discussion of pseudoephedrine and phenylpropanolamine appears in the section "Inappropriate medications for weight loss" below.)

**Digestion inhibitors**, like barley, fucus, psyllium, glucomannan, guar gum and lecithin, are thought to bind to the fats in the gut and prevent them from being absorbed.<sup>8,11</sup> Increasing fiber intake, which occurs with the use of some of these products, has the side benefit of helping to lower cholesterol levels.<sup>8</sup> However, fibrous products can decrease the absorption of other medications, so patients should be advised to take medications either one hour before or four hours after these products.<sup>8</sup>

Phaesolamin blocks digestion in a different manner. It is a protein from white kidney beans, which inhibits an enzyme that breaks down starch molecules in the intestine.<sup>8</sup> Undigested starch is passed out in the feces. Of this group of products only glucomannan has a study that showed that there was significant weight loss between the treated and placebo groups.<sup>1</sup> The treated group took glucomannan 1g three times daily for eight weeks and lost 2.5 kg on average.<sup>1</sup>

**Miscellaneous agents:** Conjugated linoleic acid (CLA) is theorized to shrink adipose tissue by inducing the death of

fat cells. Taking CLA 0.7-4.5g/day significantly decreases body fat mass and increases lean body mass in some patients, but it does not seem to reduce total body weight or BMI.<sup>8</sup> Some evidence suggests that one isomer of CLA increases insulin resistance in patients with abdominal obesity, so it should be avoided in obese patients.<sup>8</sup>

Dihydroepiandrosterone (DHEA) is popular among body builders and obese patients because it is thought to boost basal metabolism and energy expenditure.<sup>8</sup> A metabolite called 7-keto-DHEA is promoted as being safer than DHEA because it is not converted to testosterone and estrogen; however, it does seem to increase thyroid hormone levels.<sup>8</sup>

Garcinia fruit and rind extracts contain up to 50% hydroxycitric acid, which is theorized to inhibit the body's production of lipids.<sup>8,11</sup> Both garcinia cambogia and hydroxycitric acid have been tested as weight loss agents, but the results have been inconsistent and the duration of the trials was short.<sup>1</sup> Mild gastrointestinal side effects were reported.<sup>1</sup>

**Prescription products for weight loss:** Prescription drugs are recommended only for patients with BMI $\geq$ 30 or BMI $\geq$ 27 with co-morbidities who have not responded adequately to an appropriate weight-reducing diet alone.<sup>13</sup> These drugs include sibutramine and orlistat, and are not discussed in this article.

### Inappropriate medications for weight loss

Syrup of ipecac should not be used to induce vomiting to aid in weight loss. Repeated use can cause heart problems and dental erosion from acidic stomach contents.<sup>13</sup> Laxatives are thought to speed the passage of food through the gastrointestinal tract, thereby decreasing caloric intake.<sup>13</sup> However, they have little or no effect in promoting weight loss since ingested foods have already been absorbed by the time the laxative takes effect.<sup>13</sup> Prolonged use of laxatives causes electrolyte imbalance and suppresses the natural urge to have a bowel movement, leading to constipation.<sup>13</sup> Diuretics can cause an initial weight loss due to dehydration, but continued use causes electrolyte imbalances.<sup>13</sup> A decongestant, called phenylpropanolamine, was removed from the

market after a large study found that it increased the risk of hemorrhagic stroke.<sup>14</sup> Pseudoephedrine is still sold as a decongestant, but should not be sold as a weight-loss agent.

### The role of the pharmacy team

The Canadian obesity guidelines recommend involvement of a broad spectrum of healthcare providers to help patients successfully manage obesity. Adherence to lifestyle interventions in managing obesity is poor, and long-term success is modest because of significant barriers both on the part of affected individuals and healthcare professionals involved in the treatment.<sup>1</sup> As part of the spectrum of healthcare providers involved in obesity management the pharmacy team can:

- measure waist circumferences and calculate BMIs to help determine risk of obesity-related disorders
- help to assess patient's readiness for lifestyle change (as discussed in the Canadian obesity guidelines)<sup>1</sup>
- help patients interpret labels on weight loss supplements
- caution patients to avoid potentially dangerous products
- monitor patients using weight loss supplements for side effects
- provide educational materials on obesity and related issues
- help identify possible drug-induced weight gain (e.g. antipsychotics) and pharmacists can suggest alternatives when this occurs
- refer patients to dietitians for in-depth dietary counselling
- recommend exercise health professionals, since exercise is an integral component of a weight management program<sup>1</sup>
- refer patients to their physician for laboratory measurements such as fasting blood glucose levels and lipid profiles and assessment for depression and other mood disorders<sup>1</sup>
- monitor weight loss and compliment patients on their successes in losing weight thereby encouraging patients to continue

### Summary

Weight loss is a prevalent healthcare concern in our society. The benefits of maintaining a healthy weight are immense. Many patients can successfully lose weight through a low-calorie diet and regular exercise and this should be the first treatment option for overweight or obese patients. Prescription, nonprescription and herbal products can be considered for patients who still need to lose weight despite lifestyle modifications. Herbal products for weight reduction in select motivated patients may be effective in helping to treat clinically significant obesity, although the current Canadian obesity guidelines stress that there is neither evidence for nor against the use of these agents.<sup>1,15</sup> Maintenance of weight loss through dietary measures alone is a significant challenge; long-term weight loss with medications is poor and only maintained while the drug is being taken. Therefore, the importance of adopting a healthy diet and regular exercise must be emphasized as proven long-term measures to counteract obesity.

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## ► QUESTIONS

**1. Body mass index (BMI) is calculated with which of the following formulas?**

- a) Body weight in kilograms divided by height in metres squared
- b) Body weight in pounds divided by height in inches squared
- c) Body weight in pounds divided by height in metres squared
- d) None of the above

**2. A desirable BMI typically would have a value less than:**

- a) 15
- b) 25
- c) 35
- d) 45

**3. Mr R is concerned about his and his wife's health. He is wondering what the cutoff for an unhealthy waist circumference is for women and men.**

- a) 88cm (35 in) for women and 102cm (40 in) for men
- b) 79cm (31 in) for women and 88cm (35 in) for men
- c) 84cm (33 in) for women and 94cm (37 in) for men
- d) 71cm (28 in) for women and 81cm (32 in) for men

**4. Ms. C is 90 kg and 175cm/69 in tall. What is her BMI?**

- a) 19.3
- b) 24.3
- c) 29.5
- d) 34.3

**5. Ms. C has a waist circumference of 91.5cm/36 in. What does that increase her risk of?**

- a) Type 2 diabetes
- b) Hypertension
- c) Cardiovascular disease
- d) All of the above
- e) None of the above

**6. Phaeosolamin belongs to which group of weight loss agents?**

- a) Diuretic agent
- b) Digestion inhibitor
- c) Stimulant agent
- d) Meal replacement product

**7. Caffeine belongs to which group of weight loss agents?**

- a) Mineral agent
- b) Bulk forming agent
- c) Thermogenic agent

Please select the best answer for each question or answer online at [www.pharmacygateway.ca](http://www.pharmacygateway.ca) for instant results.

- d) Meal replacement product
- e) Both A and C

**8. Which agent is considered inappropriate for use for weight loss?**

- a) Pseudoephedrine
- b) Syrup of ipecac
- c) Bisacodyl
- d) All of the above
- e) None of the above

**9. Nonpharmacologic measures that can be used in the management of obesity are:**

- a) Decreasing calories consumed (especially from sugars and fats)
- b) Increasing exercise
- c) All of the above
- d) None of the above

**10. The pharmacy technician's role in obesity management and preventing the consequences of obesity include:**

- a) Having literature available on the diseases associated with overweight and obesity for interested patients
- b) Assisting in measuring patients waist circumference and calculating body mass index
- c) Providing encouragement for patients attempting to lose weight
- d) Alerting the pharmacist if a patient is purchasing a product that is inappropriate for use in weight loss
- e) All of the above

**11. You notice Tina, a regular customer, has been in the OTC section for some time. When you offer assistance she tells you that her doctor has just recommended that she try to lose weight and wants to know what she can take to make her lose weight. You ask if she can wait a minute for the pharmacist so that he/she can discuss that:**

- a) None of the OTC herbal agents are recommended for weight management
- b) Exercise and reduction of energy intake are recommended
- c) It is recommended that she consult with a dietician and exercise specialist to make a weight loss plan
- d) All of the above
- e) None of the above

**12. Tina has noticed that her father has gained weight. She would like to recommend a high-protein, low-carbohydrate**

**diet to him. She thinks that he may have some kidney and heart problems, but is not sure. You recommend that she speak with the pharmacist, but inform her that diets of that type:**

- a) May have side effects
- b) High-protein, low-carbohydrate diets can be problematic in people with heart and kidney problems
- c) To have her father speak with his physician or with the pharmacist
- d) All of the above

**13. Two weeks later Tina comes back to the pharmacy. She has measured her 10-year-old son's BMI and determined it to be only 17. She is worried about him being underweight. What do you tell her?**

- a) BMI can underestimate adolescent and children
- b) Tina should have her physician assess whether her son requires intervention
- c) Both A and B
- d) Neither A nor B

**14. Tina's niece is pregnant and her physician told her that she is gaining weight too fast. She hates to exercise, so she asked Tina to pick up some pseudoephedrine tablets for her to take to stimulate her metabolism. What do you do?**

- a) Caution Tina that some products could be dangerous, especially in expectant mothers
- b) Refuse to sell Tina the pseudoephedrine tablets and suggest that she speak with the pharmacist for more information
- c) Suggest her niece consult with a dietician and exercise specialist to make a plan
- d) All of the above

**15. Four months later Tina comes back to the pharmacy. She took your recommendations and has lost 12lbs (5.5kg). What is the most important thing you can do for her today?**

- a) Sell her an herbal weight loss agent
- b) Acknowledge her success in losing weight and encourage her to continue to work for her weight loss goal
- c) Tell her to try a laxative to speed her weight loss
- d) All of the above

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- Do you now feel more informed about obesity?  Yes  No
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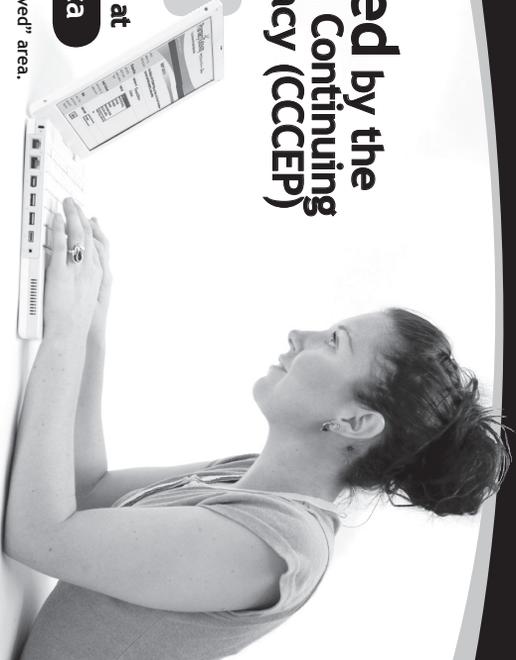
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