Obesity Update 2020

Obesity Update 2021

The Challenge of Weight Loss Maintenance



Faculty/Presenter Disclosure.

Faculty: Sarah Chapelsky, MD, FRCPC

Relationships with commercial interests:

- Grants/Research Support: N/A
- Speakers Bureau, Honoraria: Bausch Health, CPD Network, Novo Nordisk, Obesity Canada
- Consulting Fees: Bausch Health, Novo Nordisk, Enhance Health
- Other: N/A



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Learning objectives.



- Explain the pathophysiology of obesity.
- 2 Explain the common physiologic barriers to weight loss maintenance.



Explain the mechanisms through which the brain defends against weight loss.



Prioritize early intervention for chronic weight management accepting the long-term impact on disease trajectory.



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The formula for weight loss.

3500 kcal ≈ 1 pound



Weight loss requires health behaviour change.

NUTRITION

- -500 to -750 kcal/day
- 1,200-1,500 kcal/day for women; 1,500-1,800 kcal/day for men
- Evidence-based diet that restricts certain food types

ACTIVITY

- 150 min/week of moderate activity for weight loss
- 200-300 min/week for weight maintenance

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BEHAVIOURAL INTERVENTION

Self-monitoring

- Food intake
- Activity
- Weight

The challenge of weight loss maintenance.

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Follow up range from 4 to 7 years. Mann et al. *Am Psychol* 2007;62:220–33



What is the most common reason for weight regain?

A. Not being able to maintain a diet

B. Not enough time for exercise

C. Not being able to resist cravings



Body weight is **biologically defended**.





1. Morton GJ et al. Nature 2006;443:289-95. 2. Leibel RL et al. N Engl J Med 1995;31:621-8. 3. Schwartz A & Doucet É. Obes Rev 2010;11:531-47. 4 Sumithran P et al N Engl J Med 2011;365:1597-1604. 5. Rosenbaum M et al. Am J Physiol Regul Integr Comp Physiol 2003;285:R183-92. 6. Rosenbaum M & Leibel RL. Int J Obes. 2010;34:S47-55.



Lesson learned from "The Biggest Loser".

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cal = kilocalorie; lbs = pounds Fothergill E et al. Obesity. 2016;24(8):1612-1619. Figures adapted from Kolata G. New York Times. May 2, 2016.

Body weight is **biologically defended**.





Hormonal Adaptation

With weight loss, hunger hormones increase and satiety hormones decrease.

1. Morton GJ et al. Nature 2006;443:289-95. 2. Leibel RL et al. N Engl J Med 1995;31:621-8. 3. Schwartz A & Doucet É. Obes Rev 2010;11:531-47. 4 Sumithran P et al N Engl J Med 2011;365:1597-1604. 5. Rosenbaum M et al. Am J Physiol Regul Integr Comp Physiol 2003;285:R183-92. 6. Rosenbaum M & Leibel RL. Int J Obes. 2010;34:S47-55.

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Hormonal adaptation drives energy intake.



CCK = cholecystokinin; CNS = central nervous system; GLP-1 = glucagon-like peptide 1; OXM = oxyntomodulin; PYY = peptide YY. Mendieta-Zerón H et al. *Gen Comp Endocrinol* 2008;155:481-95; Sumithran P et al. *NEJM* 2011;365:1597-604.



Obesity is a **progressive disease**.





MICHAEL, 42

Patients asked to plot their weight over time with respect to life events.

Adapted from: Kushner RF. American Medical Association 2003; Kushner RF et al. American Diatetic Association 2009; Kushner RF et al. JAMA 2014;312:943-52.



Obesity is a **progressive disease**.





JENNIFER, 35

Patients asked to plot their weight over time with respect to life events.

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Obesity is a **progressive disease**.



increase in cellular markers of **INFLAMMATION HYPOTHALAMIC GLIOSIS** reduction in **CART/POMC** neurons

increase in **BODY WEIGHT** SET POINT

aMSH: a-melanocyte-stimulating hormone, AgRP: agouti-related peptide; CART: cocaine- and amphetamine-regulated transcript; CCK: cholecystokinin; GLP1: glucagon-like peptide 1; MC4R: melanocortin 4 receptor; NPY: neuropeptide Y; NTS: nucleus tractus solitarius ; PP: pancreatic polypeptide; PYY3-36: pancreatic peptide YY3-36; POMC: proopiomelanocortin Nat Rev Neurosci 2011 Oct 20;12(11):638-51. Royal Alexandra

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The brain and energy intake.



Mesolimbic System Hedonic Eating

> Hypothalamus Homeostatic Eating

Lutter M and Nestler EJ. J Nutr. 2009;139(3):629-632.



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The brain and **energy intake**.



Mesolimbic System Hedonic Eating

motivation pleasure and reward cravings

Lutter M and Nestler EJ. J Nutr. 2009;139(3):629-632.



Cravings drive energy intake.

In a survey of Canadian adults, cravings were experienced by:

overweight and <u>not trying</u> to lose weight

overweight and trying to lose weight

Vallis M. Clin Obes. 2019;e12299.

normal weight

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60%

31%

Cravings drive energy intake.



Weight-Reduced Subjects





The brain and energy intake.



Mesolimbic System Hedonic Eating

> Hypothalamus Homeostatic Eating

Executive System Initiation and Inhibition of Eating

Lutter M and Nestler EJ. J Nutr. 2009;139(3):629-632.



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Communicating with your patient...





MICHAEL, 42



Communicating with your patient...

How you would explain the **challenge of weight loss maintenance** to your patient?



MICHAEL, 42



Canadian Adult Obesity Clinical Practice Guidelines

The Three Pillars of Obesity Management that Support Nutrition and Activity



Psychological Intervention

- a. Implement multicomponent behaviour modification
- b. Manage sleep, time, and stress
- c. Cognitive behavioural therapy and/ or acceptance and commitment therapy should be provided for patients if appropriate



Pharmacological Therapy

- a. liraglutide
- **b.** naltrexone/bupropion (in a combination tablet)
- c. orlistat

CRITERIA

BMI ≥30kg/m² or

BMI ≥27 kg/m² with obesity (adiposity) related complications



Bariatric Surgery

- Procedure should be decided by surgeon in discussion with the patient.
- a. Sleeve gastrectomy
- b. Roux-en-Y gastric bypass
- Biliopancreatic diversion with/without duodenal switch

CRITERIA

BMI ≥40 kg/m² or

BMI ≥35 - 40 kg/m² with an obesity (adiposity) related complication or

BMI ≥30 kg/m² with poorly controlled type 2 diabetes

obesity obésité canada



L'ASSOCIATION CANADIENNE DES MEDECINS ET CHIRURGIENS BARIATRIQUES

THE CANADIAN ASSOCIATION OF BARIATRIC PHYSICIANS AND SURGEONS

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Obesity is chronic, progressive disease of disordered energy homeostasis.





Early intervention for obesity alters the disease trajectory.





A history of weight cycling identifies patients that are highly motivated to manage their weight.



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QUESTIONS?



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THANK YOU

