

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

Disclosure of Commercial Support

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 - The exhibitors did not provide content for Obesity Update 2021 nor did they have any editorial input or involvement with the selection of Dr. Chapelsky as a speaker.
 - The Royal Alexandra Hospital Foundation and/or Centre for Advancement of Surgical Education & Simulation (CASES) has not developed /licensed / distributed/ benefited from the sale of any product that is discussed in this program

Learning objectives.



- 1 Explain the pathophysiology of obesity.
- 2 Explain the common physiologic barriers to weight loss maintenance.
- 3 Explain the mechanisms through which the brain defends against weight loss.
- 4 Prioritize early intervention for chronic weight management accepting the long-term impact on disease trajectory.

The formula for weight loss.

3500 kcal \approx 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

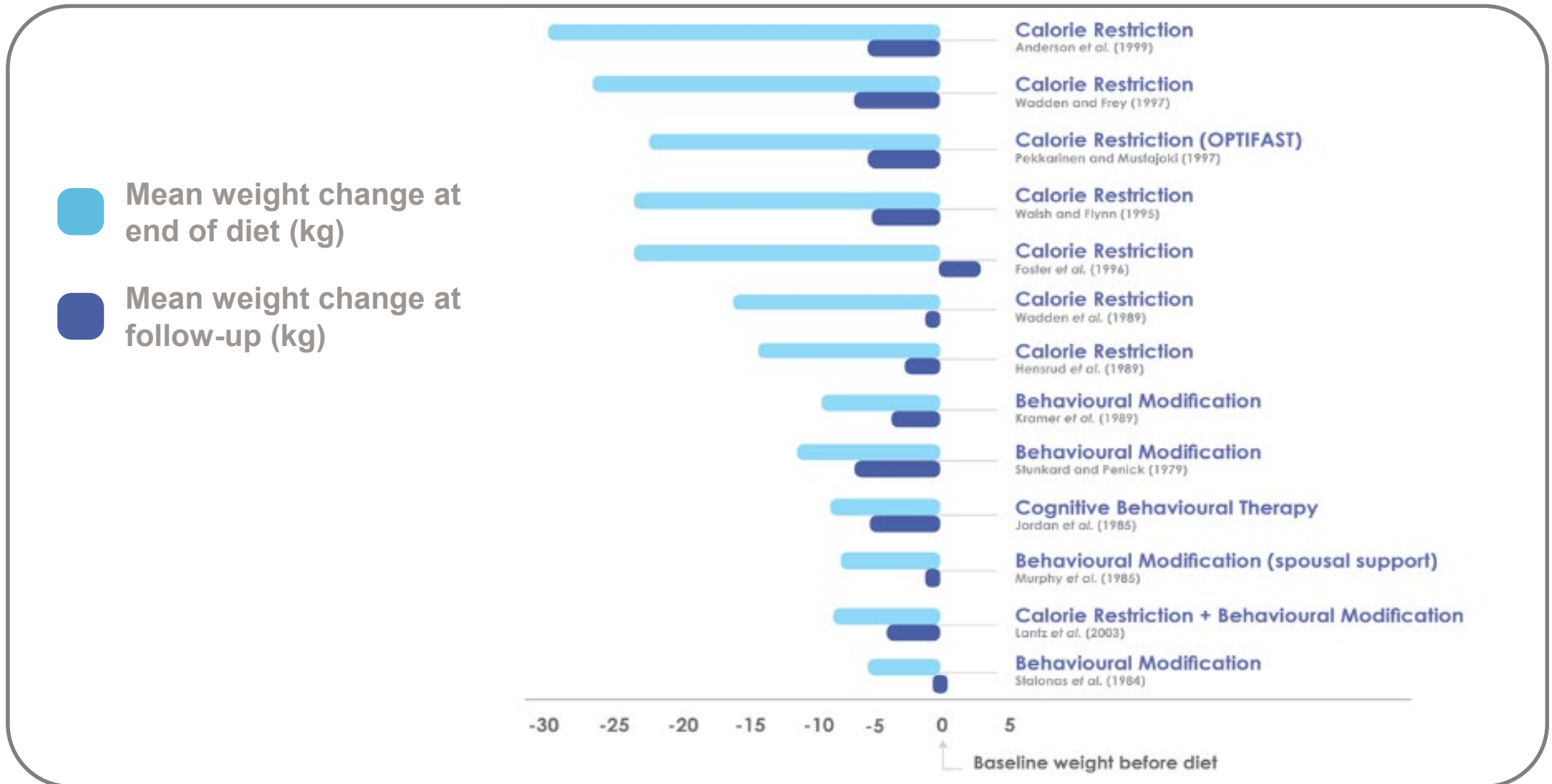
- 150 min/week of moderate activity for weight loss
- 200-300 min/week for weight maintenance

BEHAVIOURAL INTERVENTION

Self-monitoring

- Food intake
- Activity
- Weight

The challenge of weight loss maintenance.



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



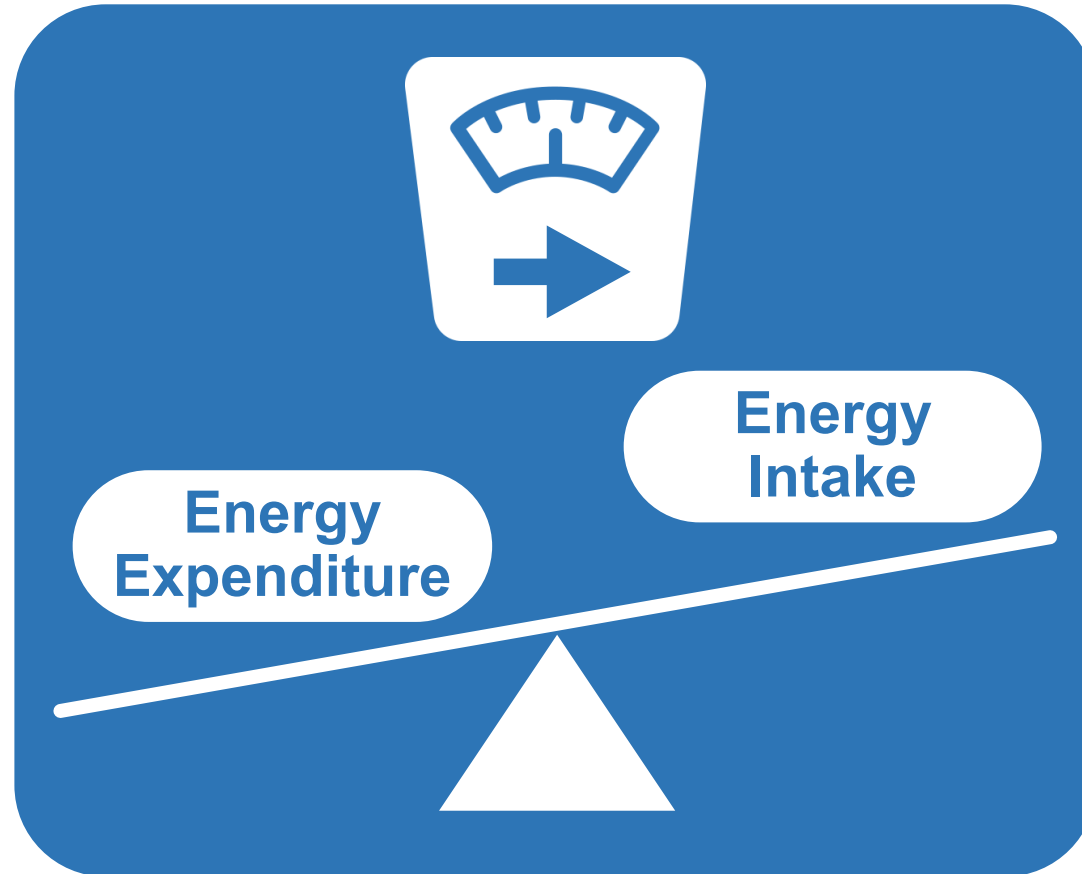
What is the most common reason for weight regain?

- 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.

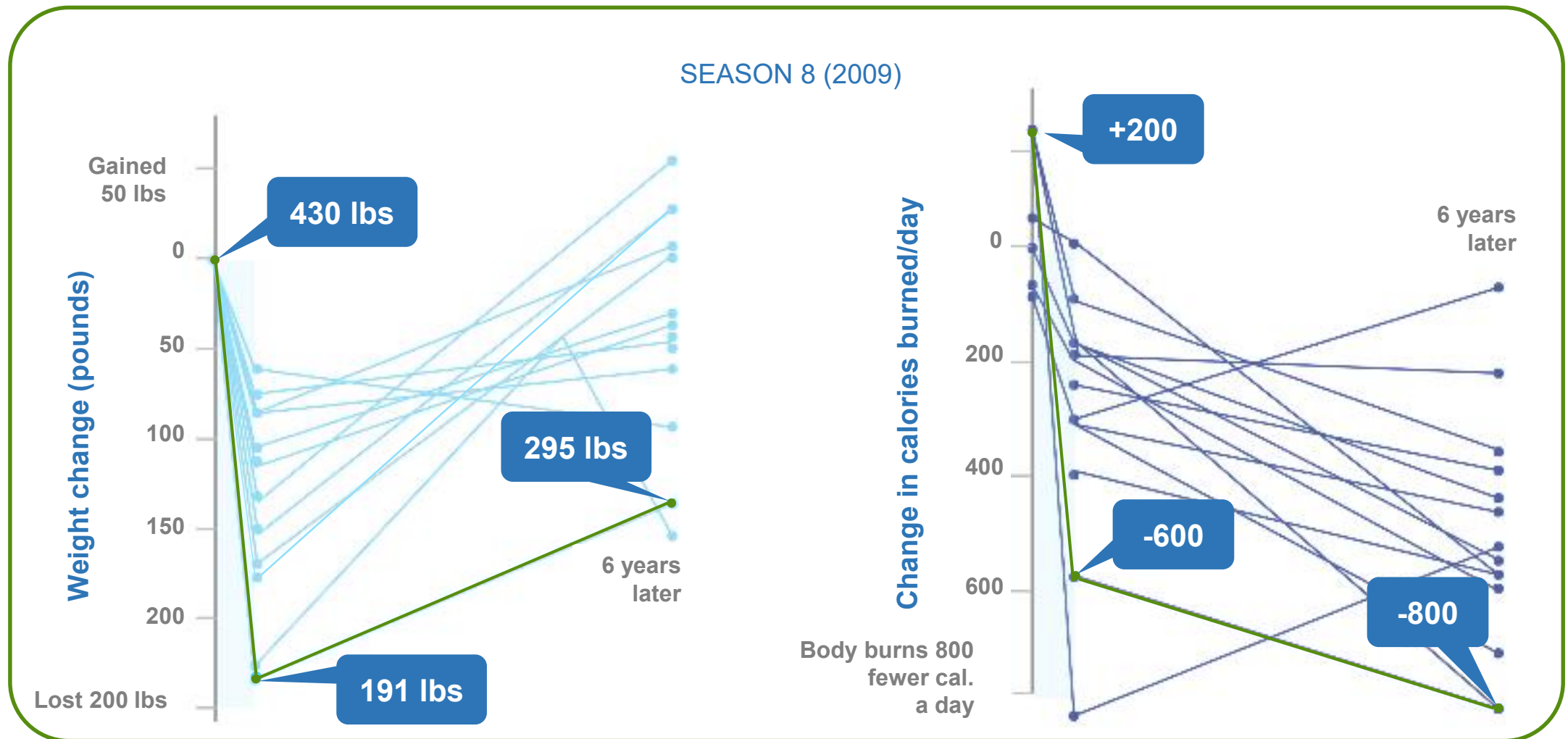
Metabolic Adaptation

Energy expenditure decreases with weight loss to a **greater extent than expected by change in body mass.**



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”.



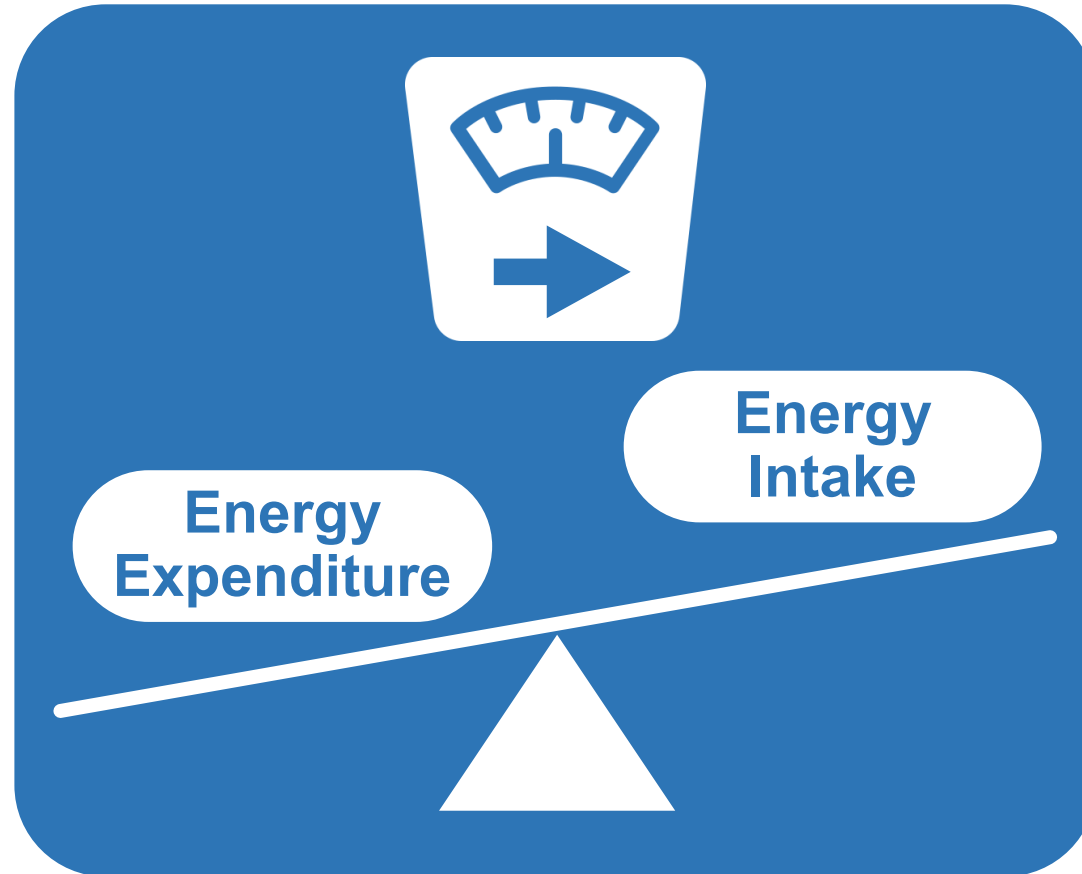
cal = kilocalorie; lbs = pounds

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

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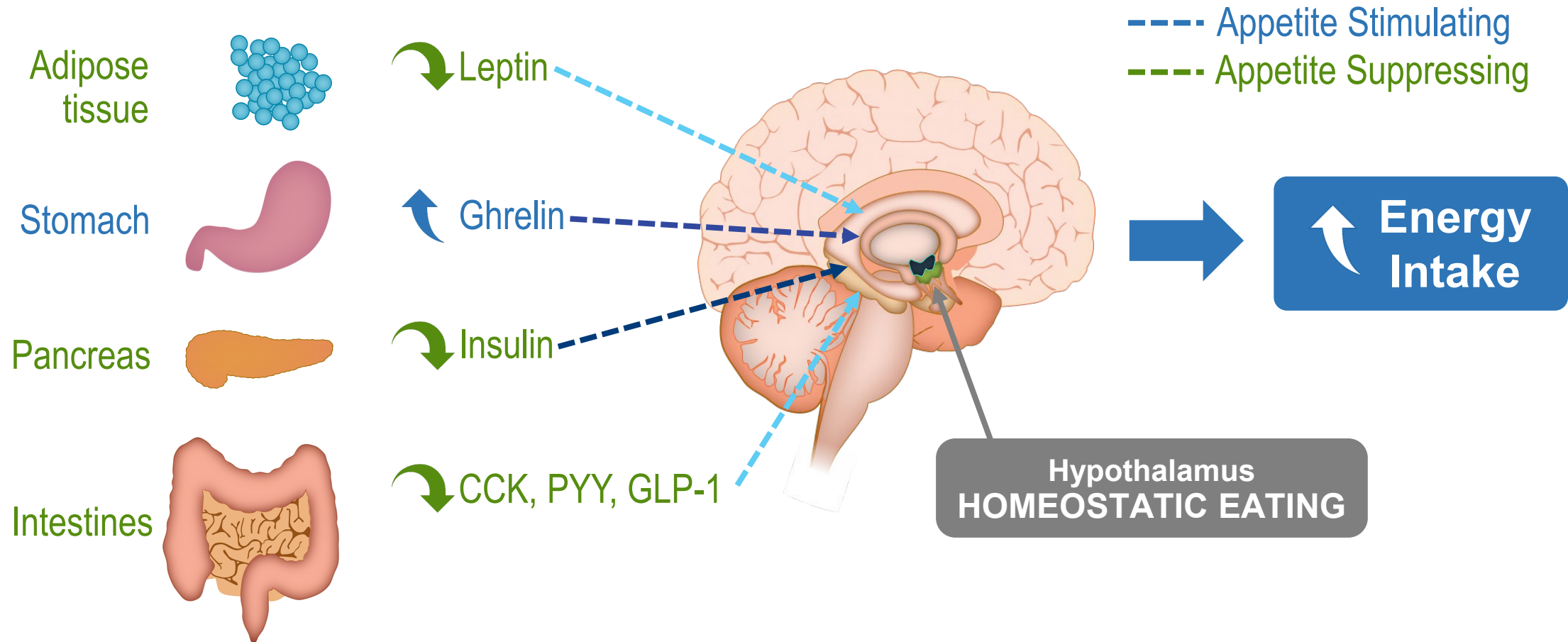


Hormonal Adaptation

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

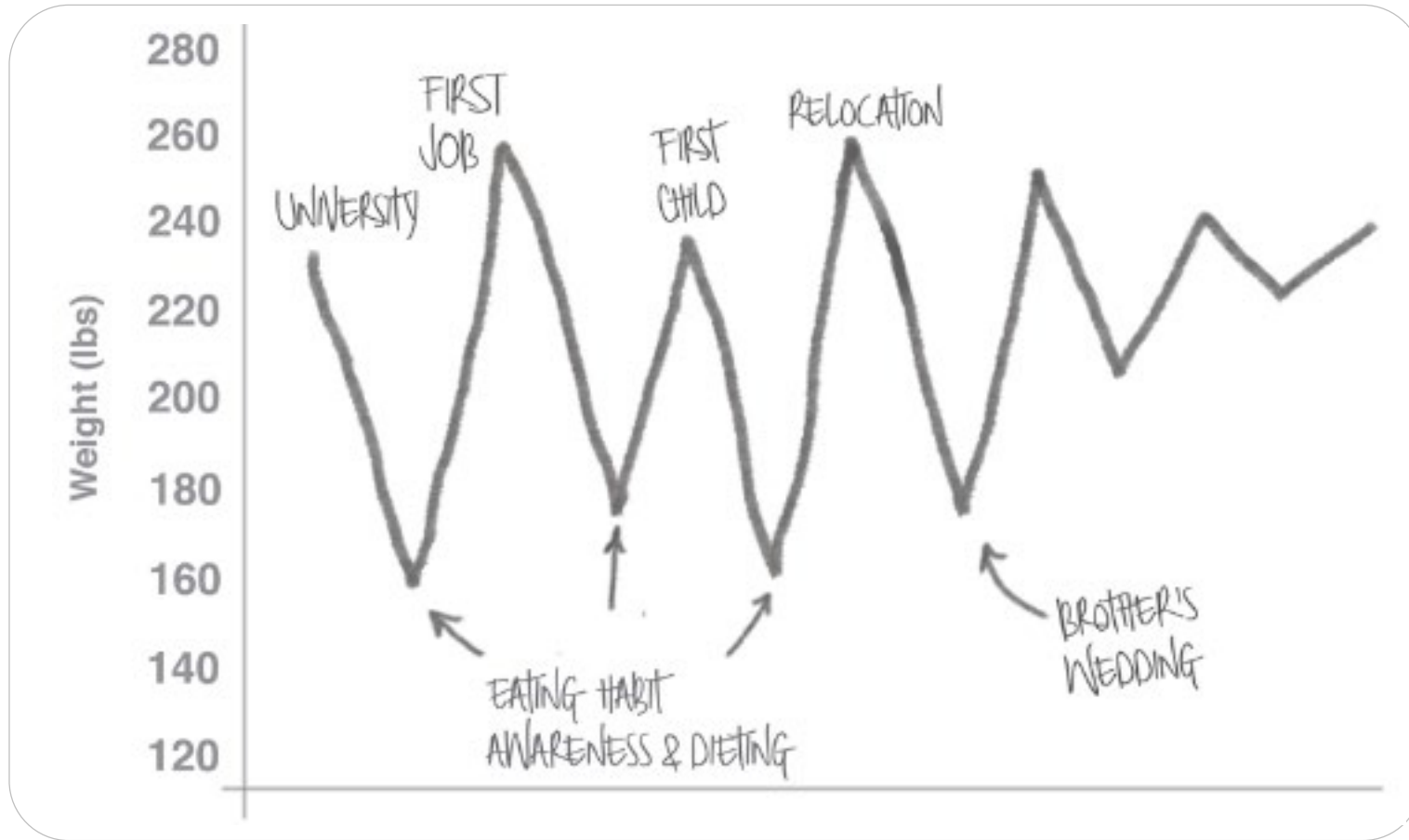
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Hormonal adaptation drives energy intake.



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.

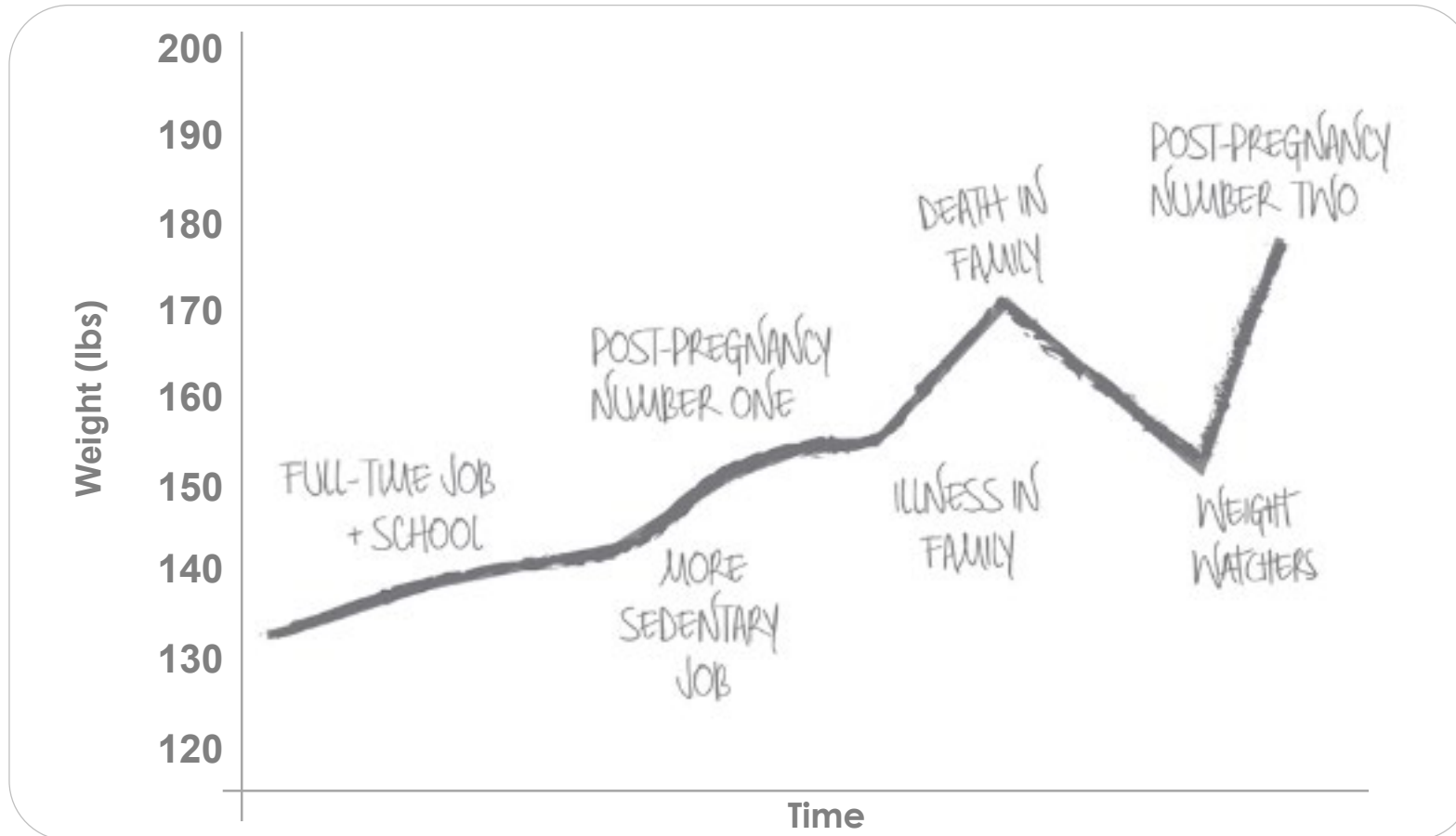


MICHAEL, 42

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 Dietetic Association* 2009; Kushner RF et al. *JAMA* 2014;312:943-52.

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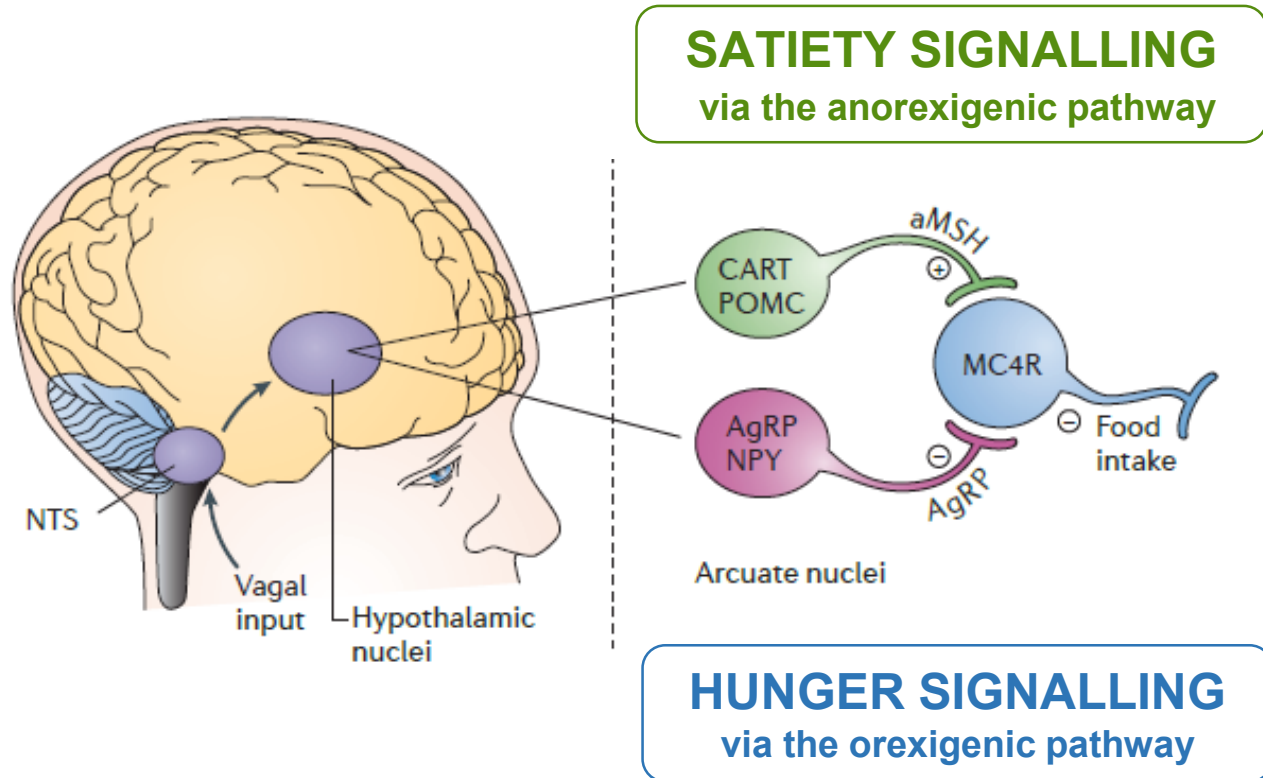


JENNIFER, 35

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

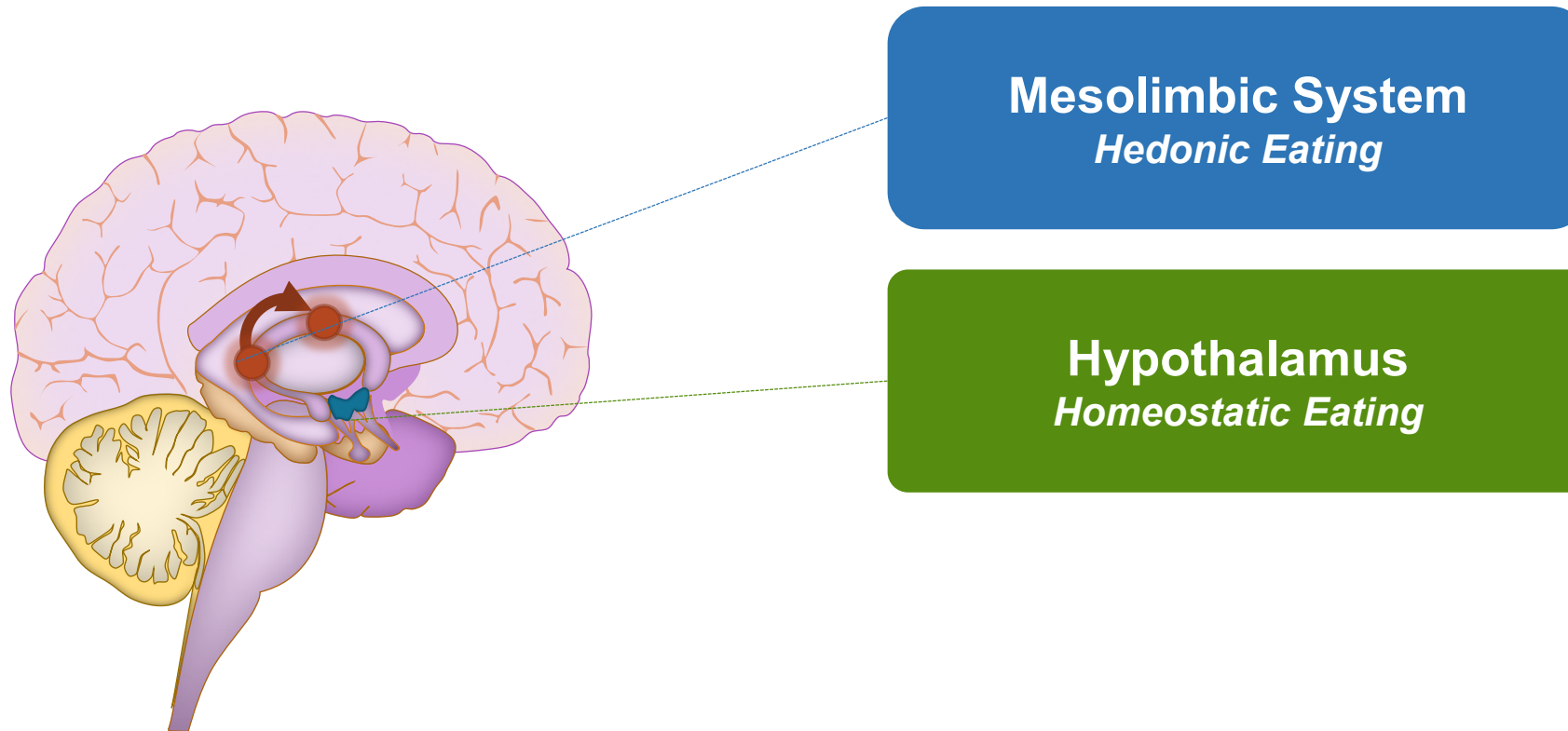
**HYPOTHALAMIC
GLIOSIS**

reduction in
CART/POMC neurons

increase in
**BODY WEIGHT
SET POINT**

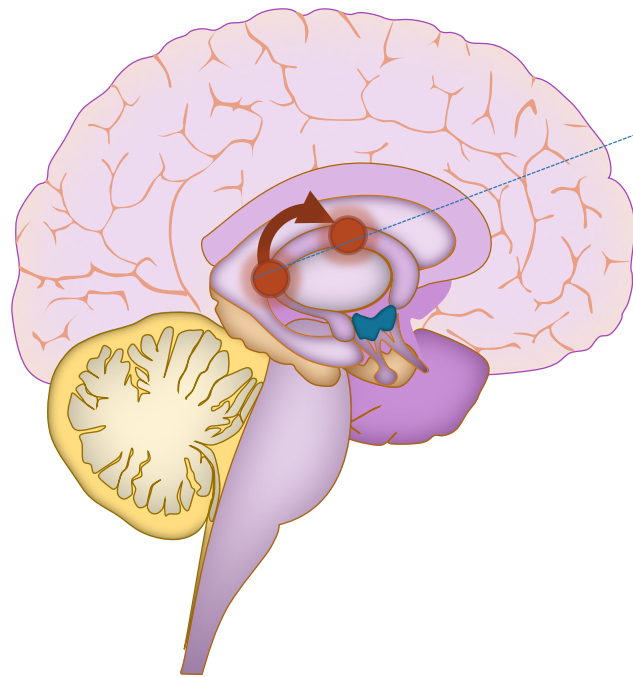
αMSH: α-melanocyte-stimulating hormone, AgRP: agouti-related peptide; CART: cocaine- and amphetamine-regulated transcript; CCK: cholecystokinin; GLP1: glucagon-like peptide 1; MC4R: melanocortin 4 receptor; NPY: neuropeptide Y; NTS: nucleus tractus solitarius; PP: pancreatic polypeptide; PYY3-36: pancreatic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

The brain and energy intake.



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

The brain and energy intake.



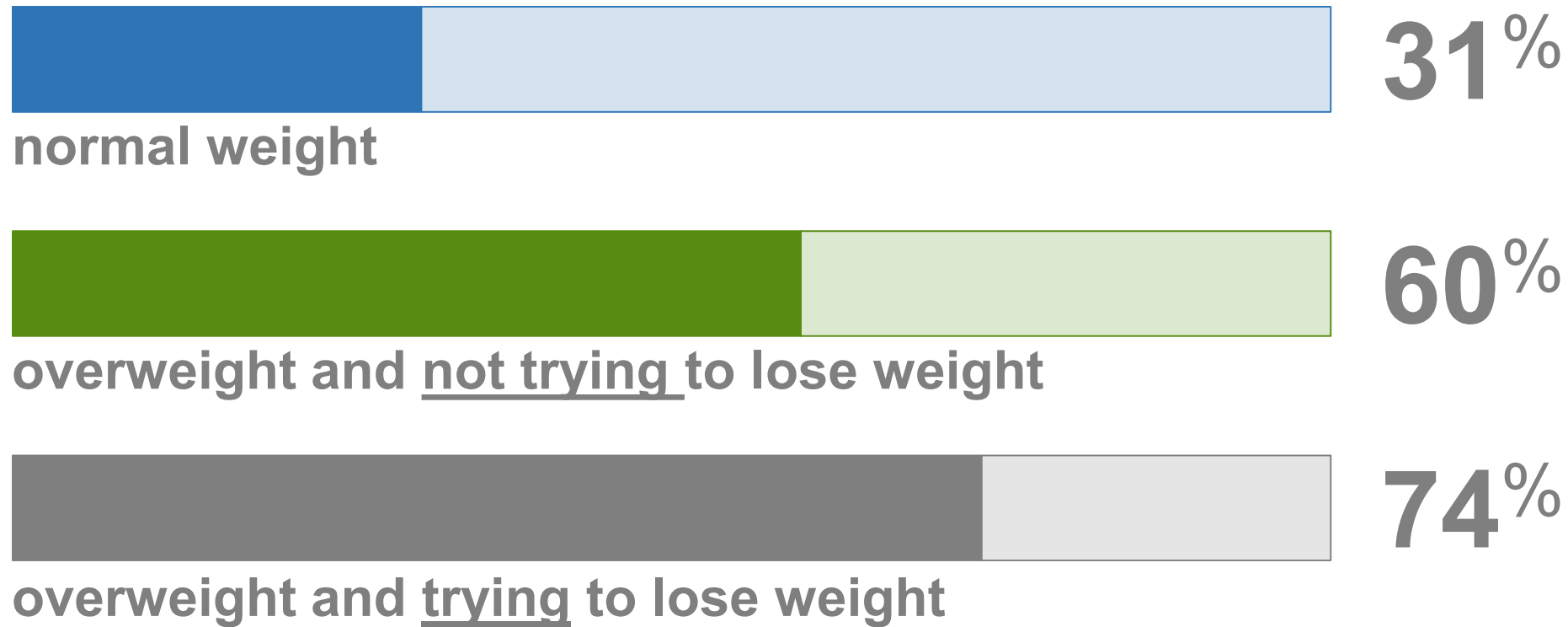
Mesolimbic System
Hedonic Eating

motivation
pleasure and reward
cravings

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

Cravings drive energy intake.

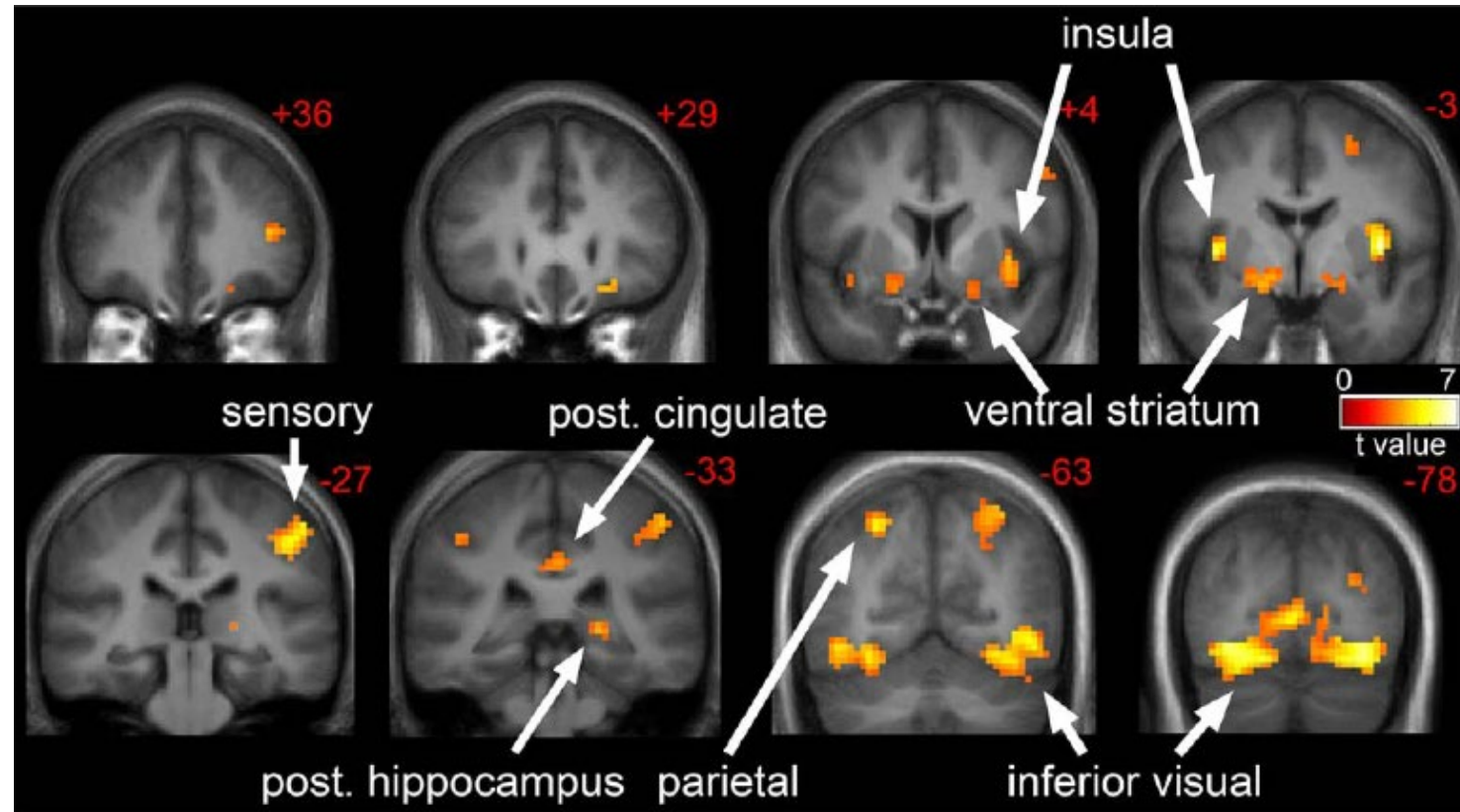
In a survey of Canadian adults, cravings were experienced by:



Vallis M. *Clin Obes.* 2019;e12299.

Cravings drive energy intake.

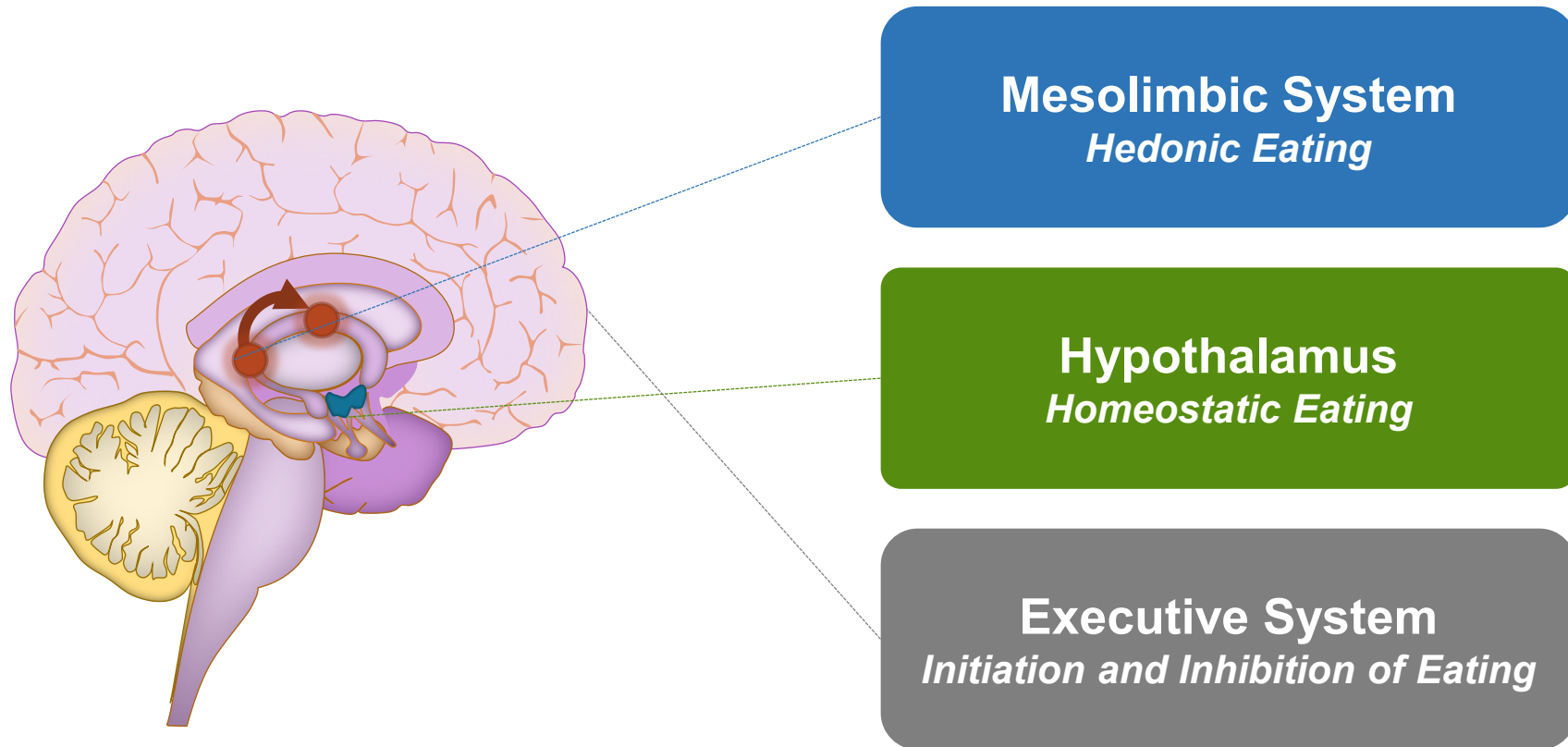
Thin
Subjects



Weight-
Reduced
Subjects

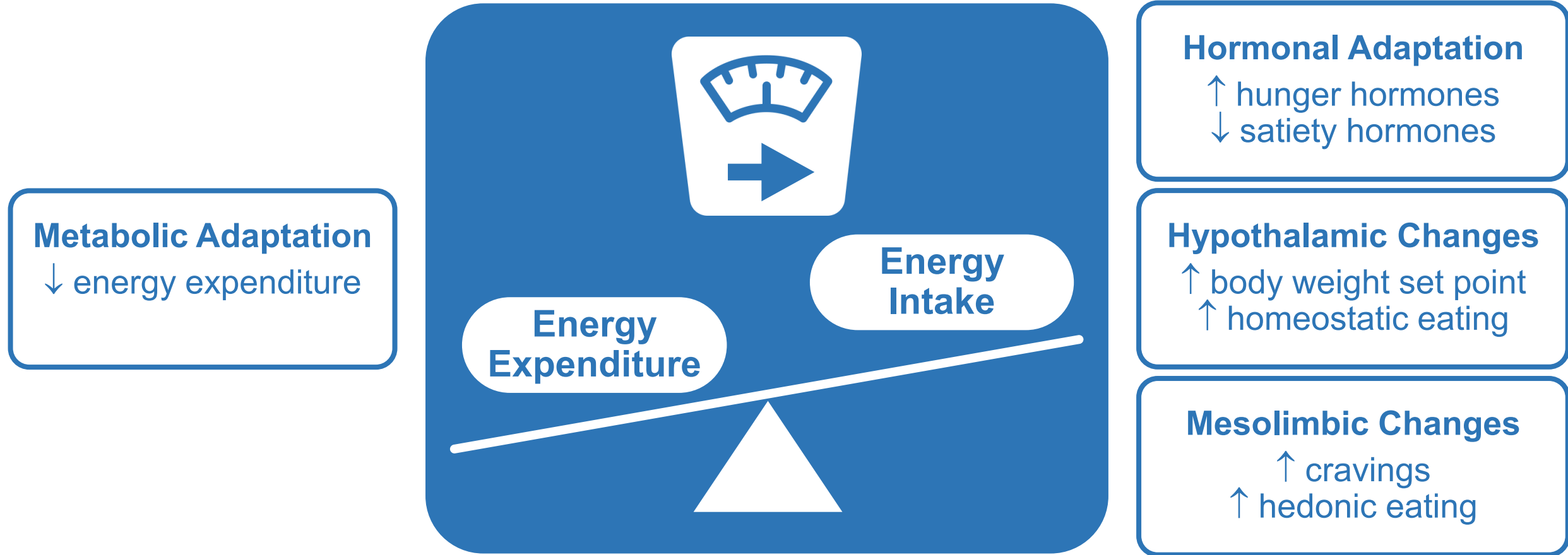
Cornier et al. *PLoS ONE*, 4:e6310, 2009.

The brain and energy intake.



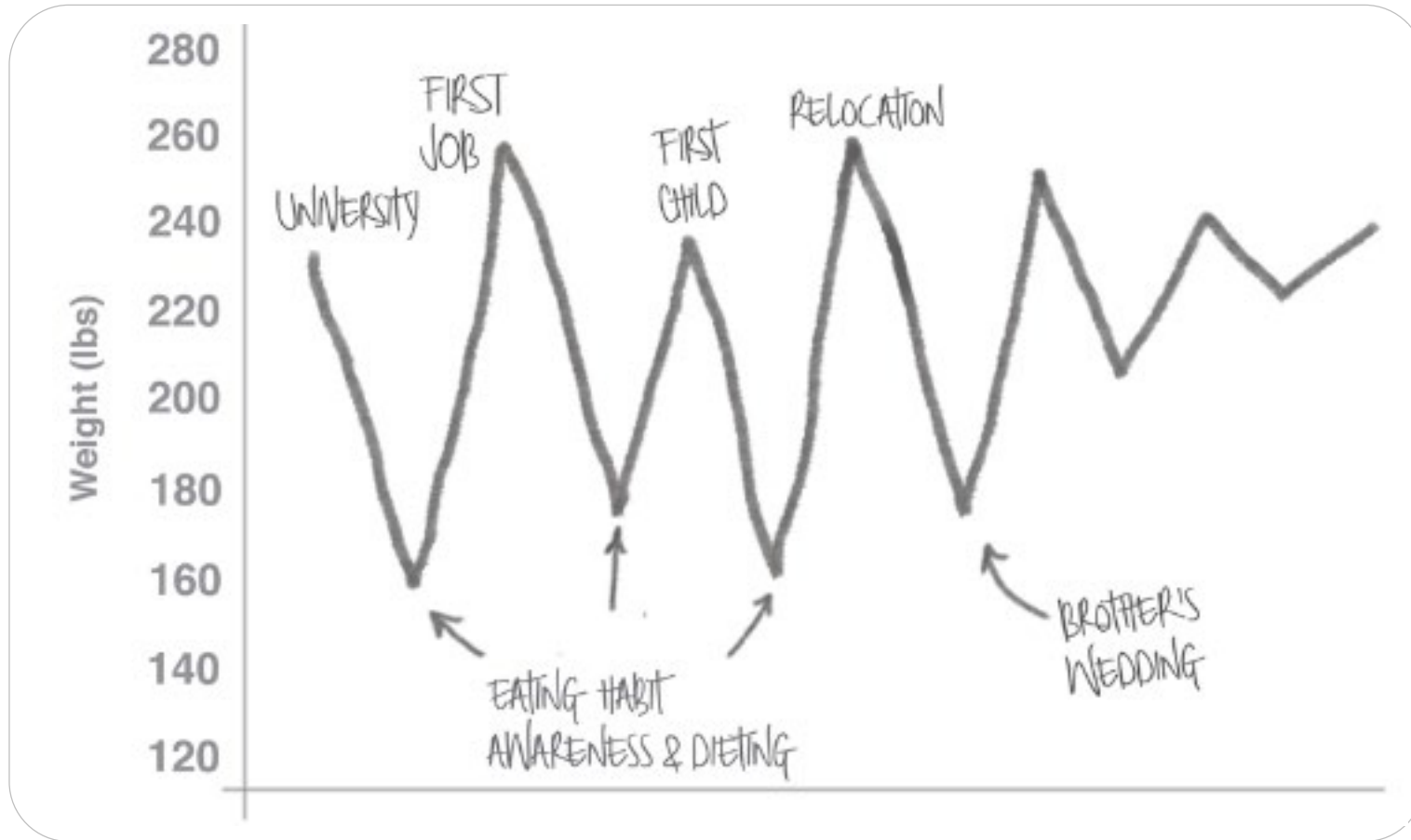
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Communicating with your patient...



MICHAEL, 42

Communicating with **your patient...**

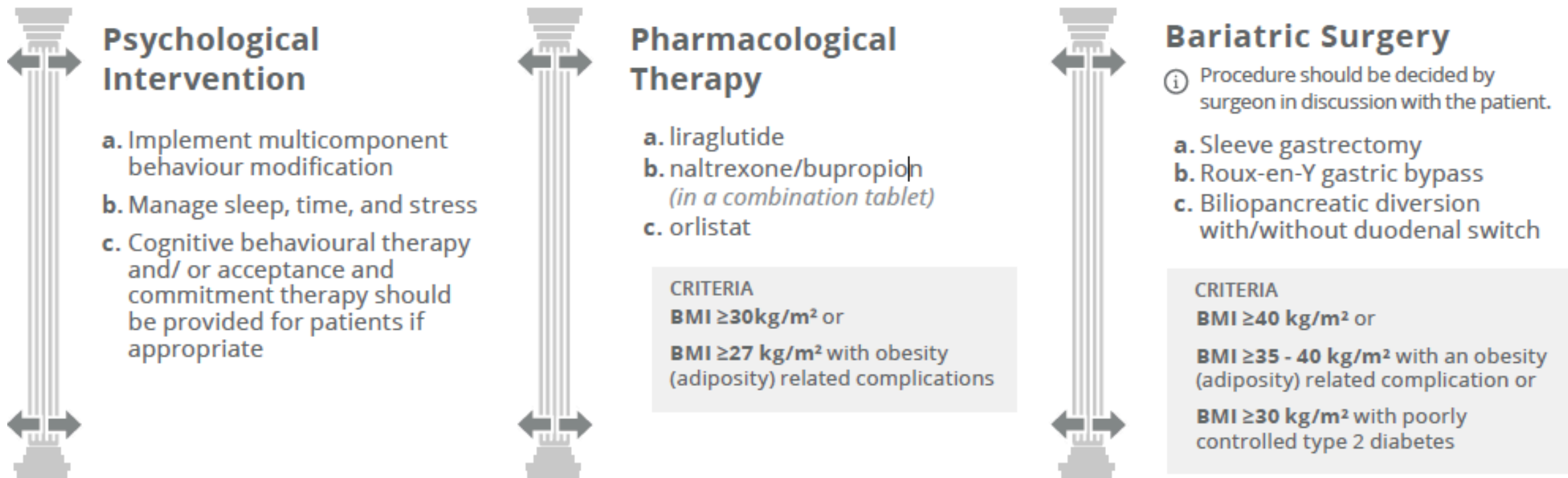
How you would explain the
challenge of weight loss maintenance
to your patient?



MICHAEL, 42

Canadian Adult Obesity Clinical Practice Guidelines

The Three Pillars of Obesity Management that Support Nutrition and Activity



1

Obesity is chronic, progressive disease of disordered energy homeostasis.

2

Early intervention for obesity alters the disease trajectory.

3

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

QUESTIONS?

THANK YOU