Obesity is a Chronic Disease Requiring Constant Medical Management and Consideration of Surgical Option

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Presenter disclosure

- **Presenter**: Diana L Lawlor MN RN NP

- **Relationships with commercial interests**:
  - **Grants/Research Support:**
  - **Speakers Bureau/Honoraria:** NovoNordisk; Bausch Health
  - **Consulting Fees:**
  - **Other:**

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  - **Other:**

Agenda

- Why Obesity ?
- Why does it require constant management?
- Why is surgery a tool to consider?

CHIPS
1.99
89

e-flux

mouse computer

STOP
DZY 3671

Obesity is a growing problem in Canada.

6 million

Canadians are living with this chronic disease.

Sources: 1. Canadian Obesity Network. 2018. Understanding Obesity Available at: http://www.obesitynetwork.ca/understanding-obesity;

Canadians living with obesity.

Sources: 1. Canadian Obesity Network. 2018. What is obesity?. Available at: http://www.obesitynetwork.ca

Obesity is recognized as a chronic disease and global health issue

"…obesity is a primary disease, and the full force of our medical knowledge should be brought to bear on the prevention and treatment of obesity as a primary disease entity…"[1]

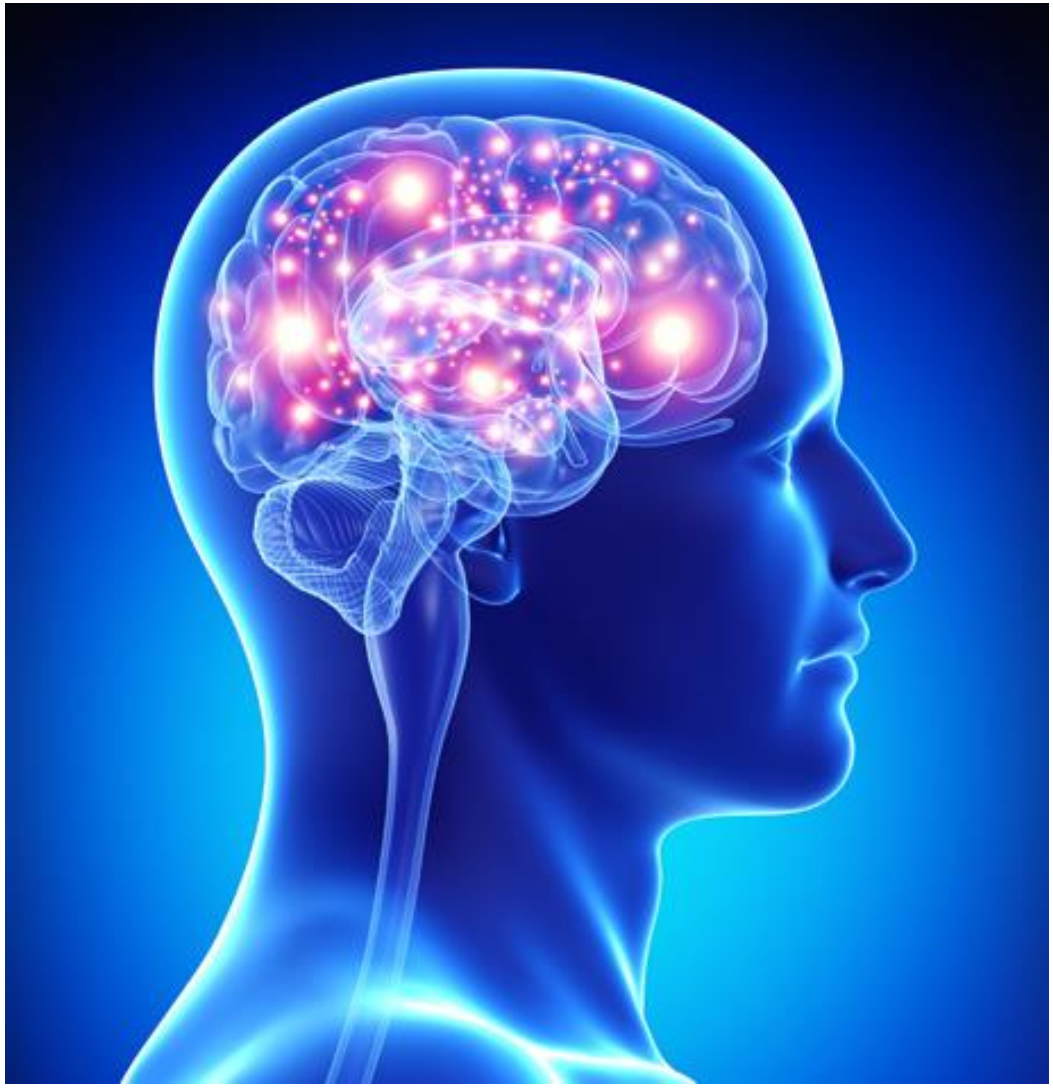
"Obesity is a chronic disease, prevalent in both developed and developing countries, and affecting children as well as adults"[3]

"Recognizing obesity as a disease will help change the way the medical community tackles this complex issue that affects approximately one in three Americans"[2]

"FDA agrees with these comments that obesity is a disease…Being overweight, i.e., being more than one's ideal weight but less than obese, however, is not a disease." [3]

"Obesity is a chronic and often progressive condition not unlike diabetes or hypertension."[4]

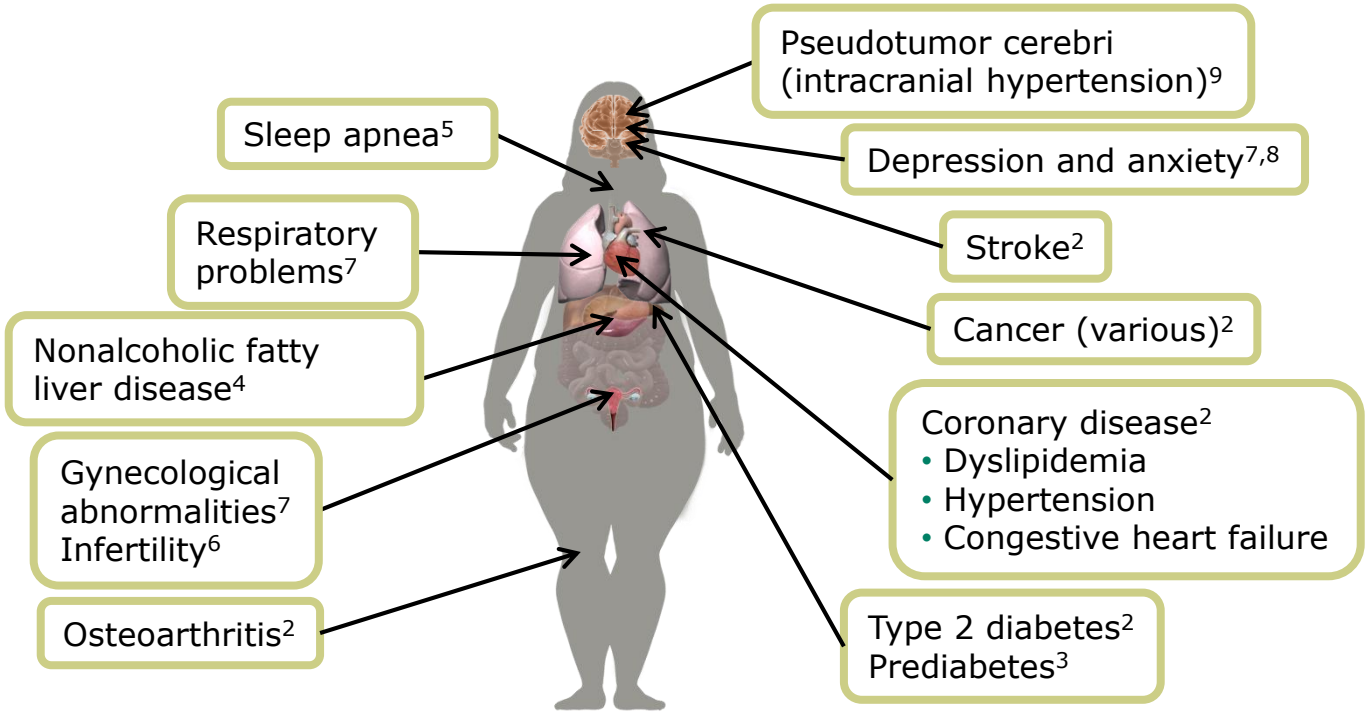
1.



Kerstin Langenberger
www.arctic-dreams.com

BIG MAC
BIG MAC

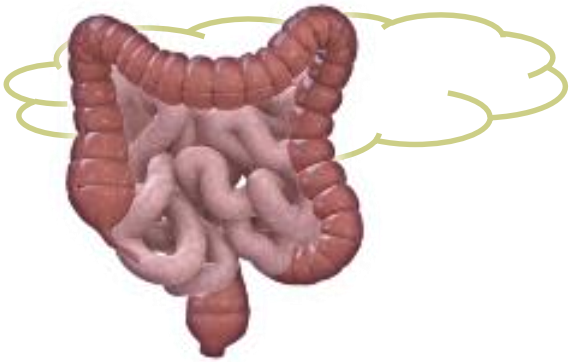
Obesity affects almost every system in the body



1. Statistics Canada Health Reports. Vol. 17. No. 3. Catalogue no. 82-003-XIE. 2. Guh DP et al. BMC Public Health. 2009;9:88. 3. Shaikh S et al. Int J Diabetes Dev Countries. 2011;31:65–69. 4. Church TS et al. Gastroenterol. 2006;130:2023–2030. 5. Li C et al. Prev Med. 2010;51:18–23. 6. Esmaeilzadeh S et al. Arch Med Sci. 2013;9:499-505. 7. NIH. Obes Res. 1998;6(Suppl 2):51S–209S; 8. Zhao G et al. *Int J Obes (Lond).* 2009;33(2):257-66. 9. Daniel AB et al. *Am J Opthalmol* 2007;143:635-41.

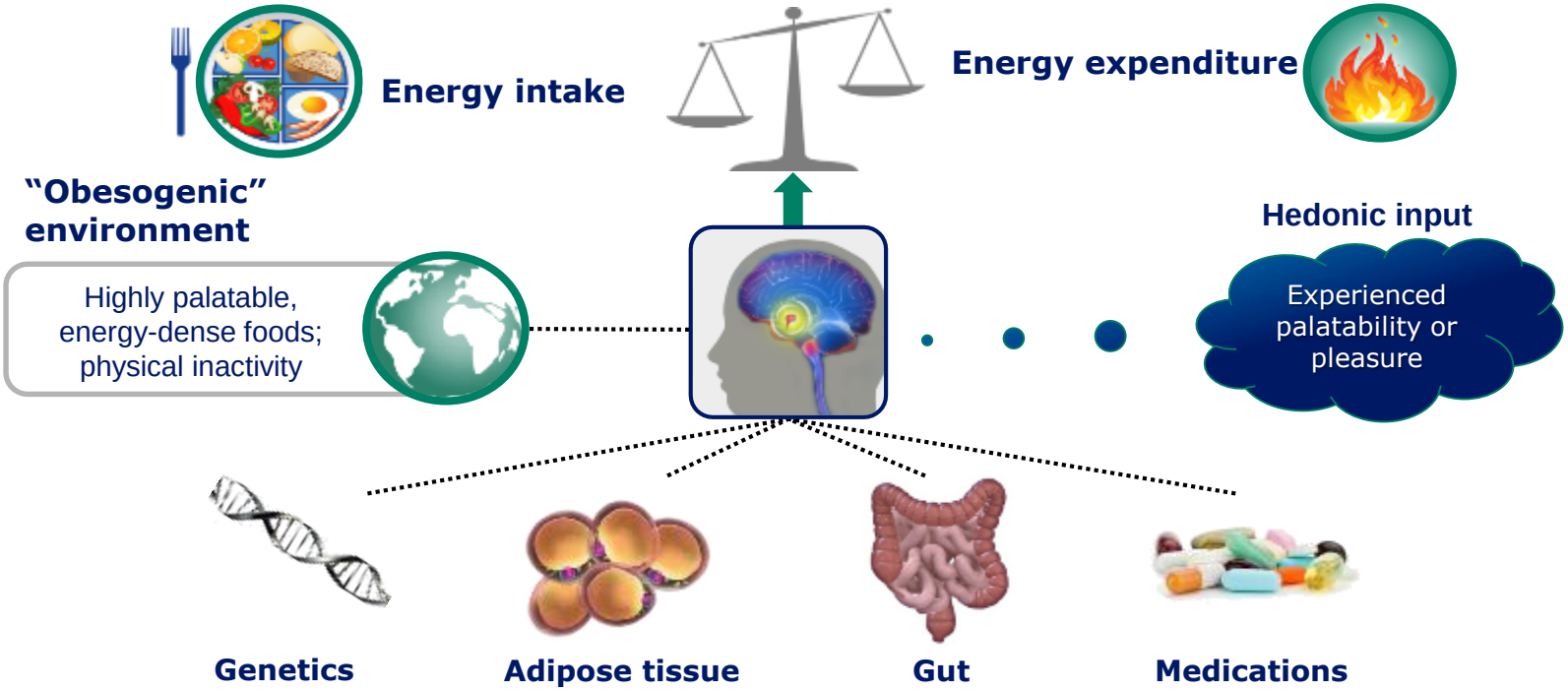
Energy intake

Energy expenditure



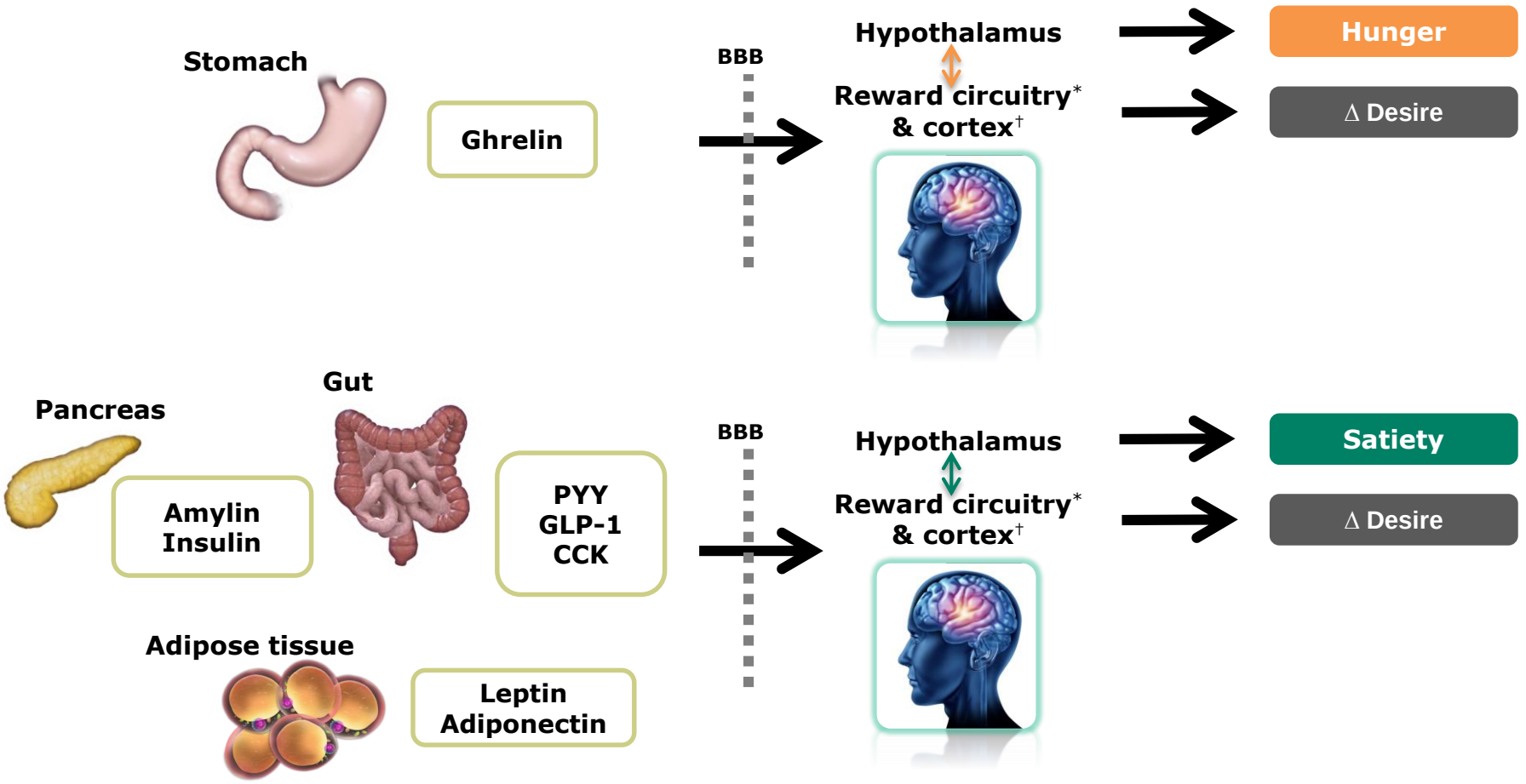
1. Woods SC et al. *Int J Obes Relat Metab Disord*. 2002;26 Suppl 4:S8–S10. 2. Ludwig DS. *JAMA*. 2014;311:2167–2168. 3. Speliotes EK et al. *Nat Genet*. 2010;42:937–948. 4. Garvey WT et al. *Endocr Pract*. 2014;20:977–989. 5. Bray GA and Ryan DH. *Ann NY Acad Sci*. 2014;1311:1-13.

Obesity is a complex and multifactorial disease



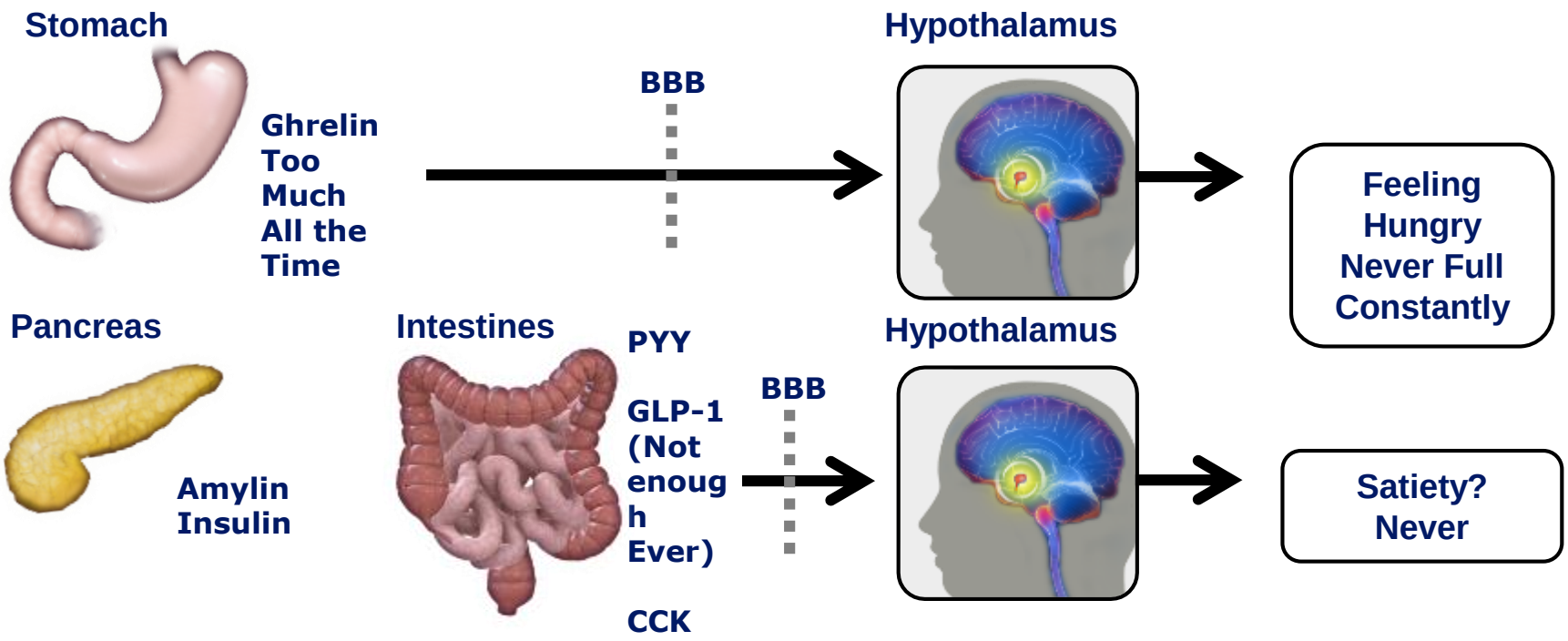
1. Woods SC et al. *Int J Obes Relat Metab Disord*. 2002;26 Suppl 4:S8–S10. 2. Ludwig DS. *JAMA*. 2014;311:2167–2168. 3. Speliotes EK et al. *Nat Genet*. 2010;42:937–948. 4. Garvey WT et al. *Endocr Pract*. 2014;20:977–989. 5. Bray GA and Ryan DH. *Ann NY Acad Sci*. 2014;1311:1-13.

Hunger, satiety and desire are regulated by a number of hormones



BBB = blood-brain barrier; CCK = cholecystokinin; GLP-1 = glucagon-like peptide-1; PYY = peptide YY.
*the brain's reward circuitry, especially in the ventral tegmental area and nucleus accumbens. †especially the dorsolateral pre-frontal cortex.
Suzuki K et al. Exp Diabetes Res. 2012;2012:824305; Berthoud HR. Curr Opin Neurobiol. 2011;21(6):888–896.

With Obesity ….



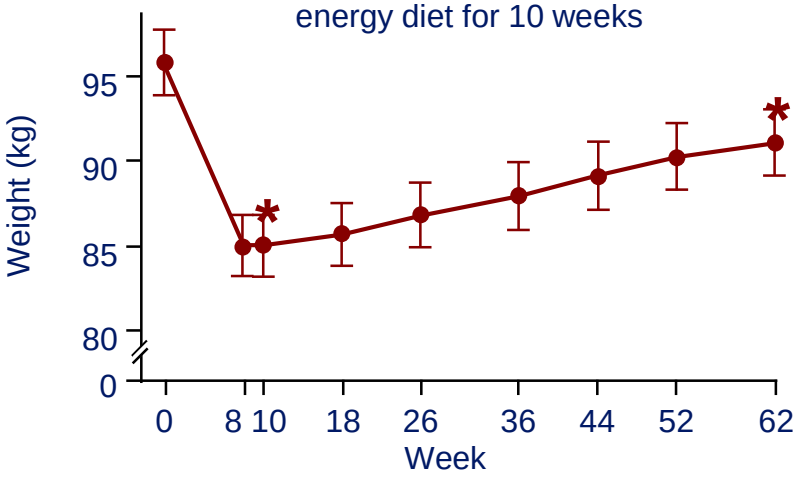
BBB, blood-brain barrier; CCK, cholecystokinin; GLP-1, glucagon-like peptide-1; PYY, peptide YY.

1. Suzuki K et al. *Exp Diabetes Res*. 2012;2012:824305.

- The brain is designed to protect against famine and to ensure a constant supply of nutrients/sugar for energy.
- The higher the weight the better the brain likes it
- Swim against the current…message
- Understanding why change is so tough…may help to create change

Weight Loss Increases Hunger and Chronic Hormonal Adaptation

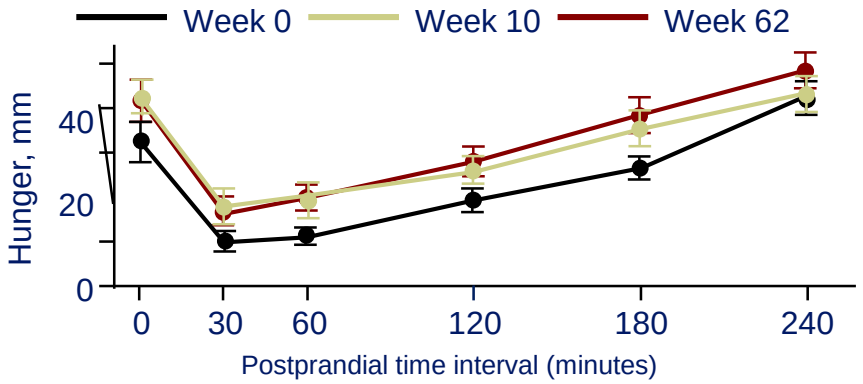
Significant weight loss was observed in participants after being on a very-low-energy diet for 10 weeks



As early as week 10

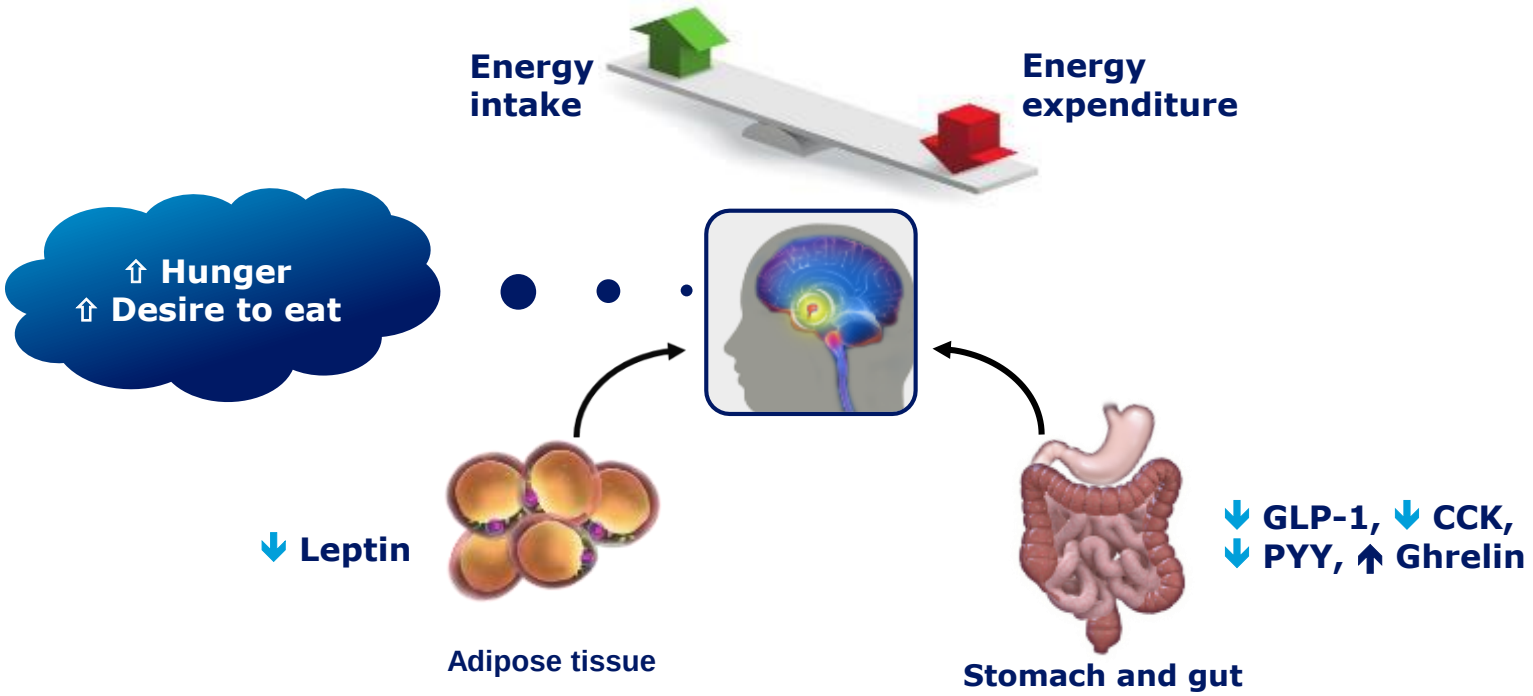
Significant hormonal changes that favour weight regain and were still evident a year later

- ↓ Insulin
- ↓ Leptin
- ↓ PYY
- ↓ CCK
- ↓ GLP-1
- ↑ Ghrelin



Adapted from Sumithran P et al. N Engl J Med. 2011;365:1597-604.

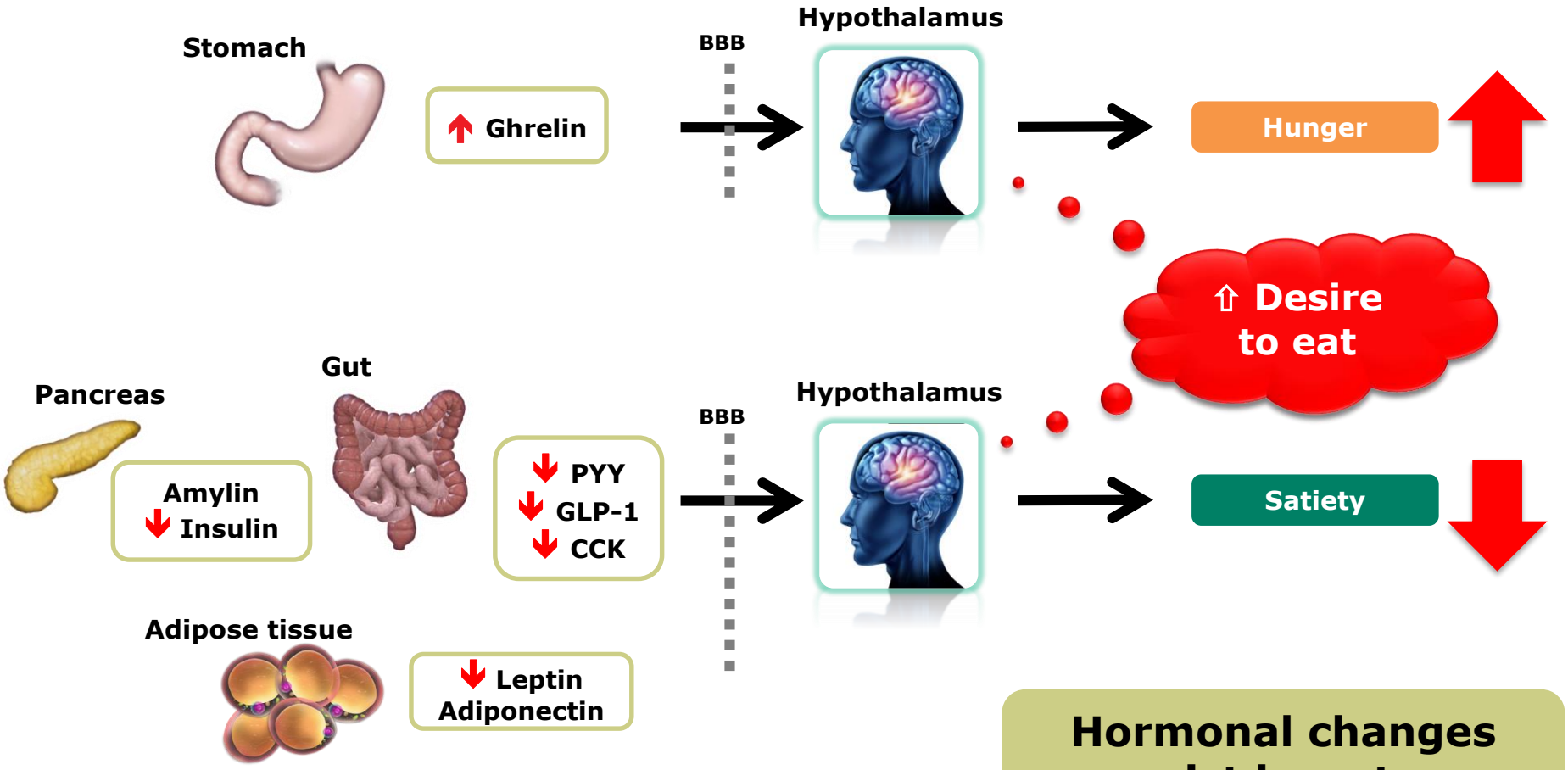
Physiologic and metabolic responses to weight loss favor weight regain[1-3]



CCK, cholecystokinin; GLP-1, glucagon-like peptide-1; PYY, peptide YY.

1. Schwartz A & Doucet É. *Obes Rev.* 2010;11:531–547. **2.** Sumithran P et al. *N Engl J Med.* 2011;365:1597–1604. **3.** Rosenbaum M et al. *Am J Physiol Regul Integr Comp Physiol*. 2003;285:R183–R192.

Following weight loss, physiologic and metabolic responses favour weight regain

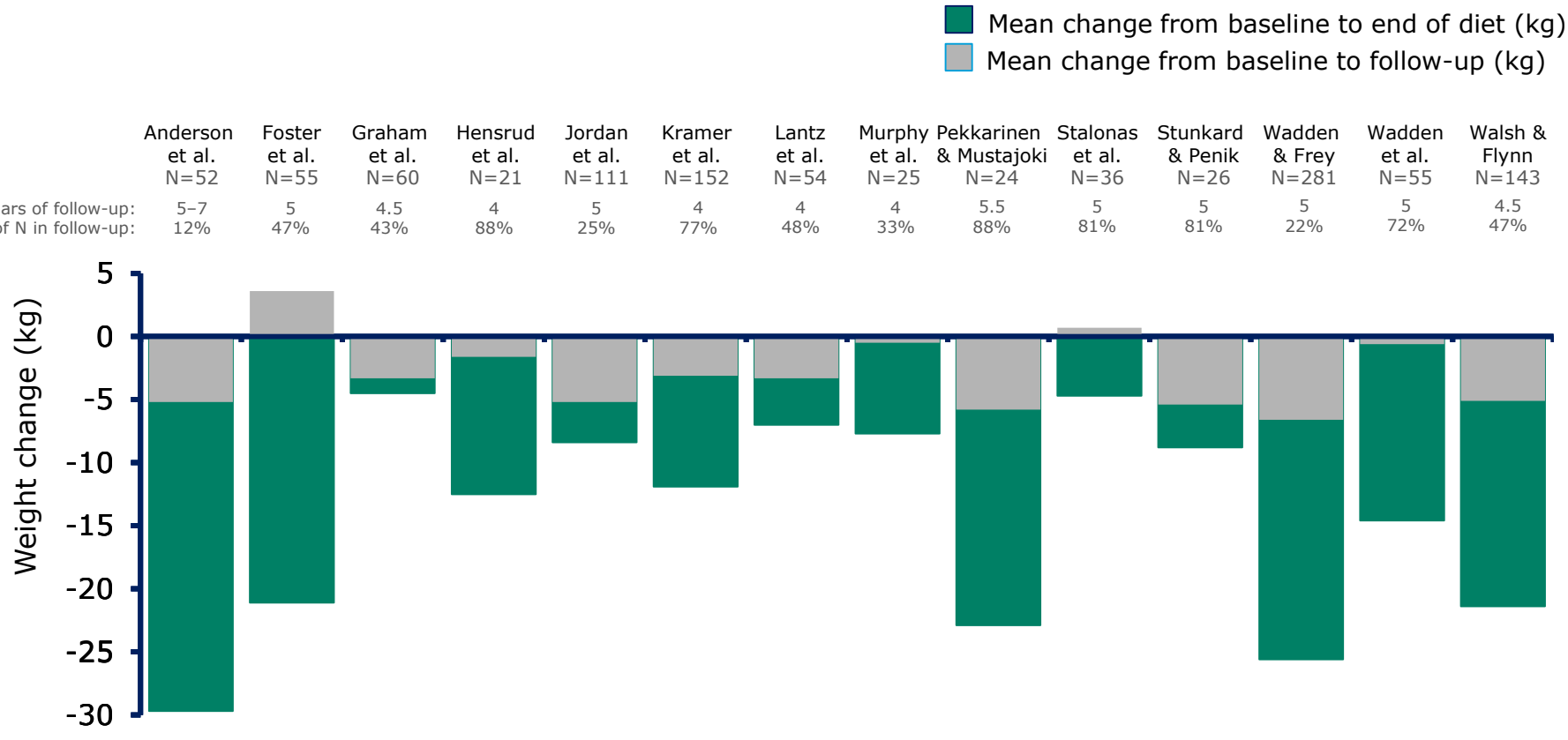


Hormonal changes persist long-term

BBB, blood-brain barrier; CCK, cholecystokinin; GLP-1, glucagon-like peptide-1; PYY, peptide YY.

Suzuki K et al. Exp Diabetes Res. 2012;2012:824305; Schwartz A & Doucet É. Obes Rev. 2010;11:531–47. 2. Sumithran P et al. N Engl J Med. 2011;365:1597–604. 3. Rosenbaum M et al. Am J Physiol Regul Integr Comp Physiol. 2003;285:R183–R92.

Unintentional weight regain is common after diet-associated weight loss

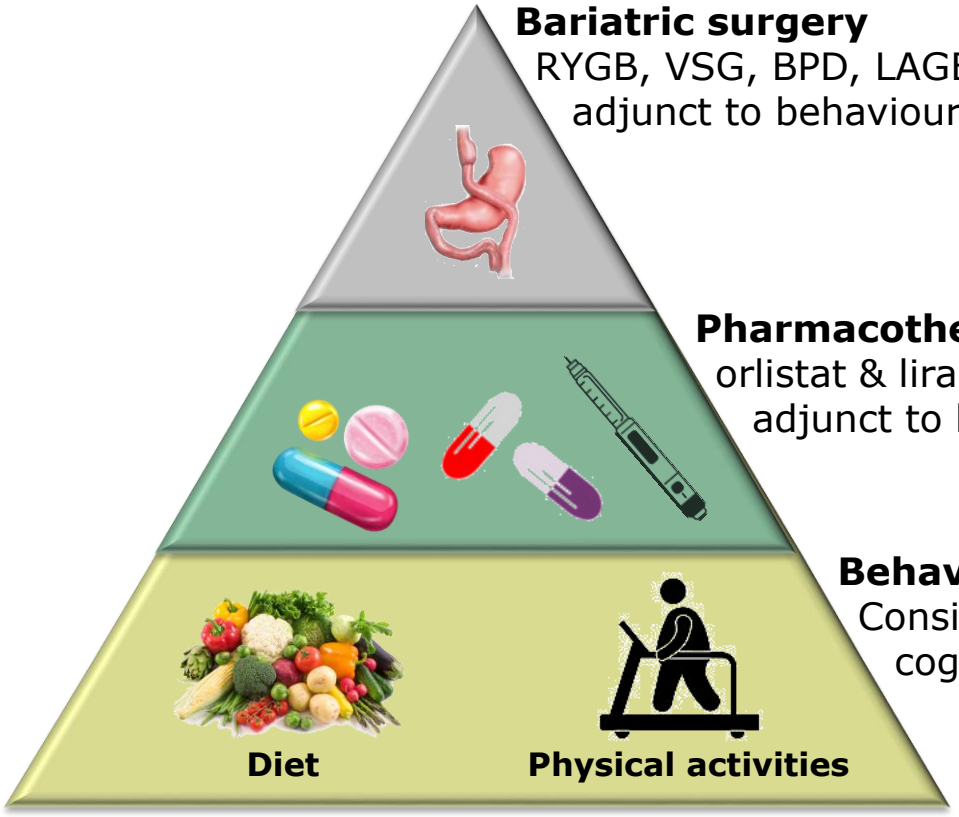


P-values not available

Follow up range from 4 to 7 years

Mann et al. Am Psychol 2007;62:220–33

Three principal treatment modalities for obesity



Bariatric surgery
RYGB, VSG, BPD, LAGB;
adjunct to behavioural modifications

Pharmacotherapy
orlistat & liraglutide;
adjunct to behavioural modifications

Behavioural modifications
Consists of nutrition, physical activity, and cognitive-behavioural therapy

The choice of treatment depends on the evaluation of a patient's level of obesity and their risk of obesity-associated disease

BPD = biliopancreatic diversion; LAGB = laparoscopic adjustable gastric banding; RYGB = Roux-en-Y gastric bypass; VSG = vertical sleeve gastrectomy.

Lau et al. CMAJ 2007;176(8 suppl):Online-1–117.

Canadian guidelines for the clinical management of obesity

Treatment	BMI category (kg/m²)				
	≥25	≥27	≥30	≥35	≥40
Behavioural modification Consists of nutrition, physical activity, and cognitive-behavioural therapy	With comorbidities	With comorbidities	✓	✓	✓
Pharmacotherapy Adjunct to behavioural modifications; consider if patient has not lost 0.5 kg per week by 3–6 months after behavioural changes		With comorbidities	✓	✓	✓
Bariatric surgery Consider if other weight loss attempts have failed. Requires lifelong medical monitoring				With comorbidities	✓

✓ Indicates a treatment recommendation for that BMI class. BMI, body mass index

Lau et al. CMAJ 2007;176(8 suppl):Online-1–117

Summary

- Our environment has changed. Access to food and energy required to access food and move is significantly different
- We have adapted to our changing environment in terms of how we live however our brain function remains unchanged from days of famine.
- People who struggle with their weight will tell us that they have lost and regained 100s of lbs throughout their lives. On target for a while from a behavior perspective and then off target behavior returns….high carbohydrate foods, feeling constantly hungry, fast food/food of convenience, no longer exercising, no longer journaling….
- People need to constantly be assessed and from a biology perspective clinicians consider --Low levels of GLP1; high levels of Ghrelin and the fact that the hypothalamus is constantly fighting to achieve pleasure and the highest possible weight
- The message needs to be communicated that the Biology/Pathophysiology will be a constant battle and why at some point consideration of medication options and surgery as an additional tool may be key