Body Weight Regulation:

A Calorie Is NOT A Calorie

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Learning Objectives

- Understand overweight/obesity as a chronic disease.
- Understand concept of a “weight set point”.
- Understand metabolic adaptation to weight change.
- Understand expected amount of weight loss from different approaches including diet, exercise, medication, or surgery.
- Understand expected benefits of dietary change, exercise, and weight loss.
- Understand strategies for weight regain prevention.
Obesity is a chronic disease affecting 95 million adults. That’s more than 3x the number of adults with diabetes.²,³

How obesity ranks compared with some other health challenges in the US

Millions of adults have health challenges. Obesity is one of the most prevalent.

About 75 million adults in the US with high blood pressure⁴,⁶

78 million adults in the US with high cholesterol who are recommended medicine⁵,⁶
About 40% of all cancers diagnosed in the US have been associated with overweight and obesity.

13 cancers associated with excess weight and obesity\(^6\)

- Meningioma
- Thyroid
- Breast
- Adenocarcinoma of the esophagus
- Liver
- Multiple myeloma
- Upper stomach
- Kidney
- Gallbladder
- Ovarian
- Pancreatic
- Uterine
- Colorectal

Data from 2014 CDC report.\(^6\)
Factors of Obesity

Obesity is a chronic disease that can be caused by a range of factors.

What contributes to obesity?

The main contributing factors can be classified into environmental and societal (external) and genetic (internal).¹⁻³
Overweight/Obesity as a Chronic Disease

- Not everyone has the same “metabolism.”
- Obesity is a spectrum of disease from mild to severe.
- There are many different forms of this disease, more aptly known as “obesities.”
Overweight/Obesity as a Chronic Disease

- Fat is metabolically active, causing a constellation of signs and symptoms in the rest of the body.
- Successful treatment needs to be individualized, comprehensive, and long term.
Your Weight Set Point

- Evolutionary advantage to maintaining a weight set point.
- Determined mostly by genetics and environment.
- Your weight history may reveal your weight set point and provide insight.
After weight loss, metabolic adaptation may result in increased signals for energy intake (increase in the hunger hormone [ie, ghrelin] and decrease in satiety hormones [eg, GLP-1, PYY, CCK, amylin]).\textsuperscript{1,2}

\begin{itemize}
\item Ghrelin
\item Amylin
\item Insulin
\item Leptin
\item GLP-1
\item PYY
\item CCK
\end{itemize}

Patients were randomized to calorie restriction (CR), calorie restriction with exercise (CREX), or low-calorie diet (LCD) groups. Mean percent weight change (SEM) at six months by group was: -10.4 (0.9)\% (CR), -10.0 (0.8)\% (CREX), and -13.9 (0.7)\% (LCD) of initial body weight.\textsuperscript{3}
Your Weight Set Point

- Changes over time (10% per decade).
- Affected by various factors, such as medications, lifestyle, hormones, body composition changes, and other medical conditions.
- All weight changes tend to follow predictable curves from your weight set-point.
- Value and insight in determining your weight set-point for reference, rather than just a BMI chart.
Metabolic Adaptation to Weight Loss

- Constellation of responses to a change from weight set point.
- Promote a return to the weight set-point.
- Increase / decrease of resting metabolic rate.
- Increase / decrease in hunger and cravings.
- Increase / decrease in satiety / satiation.
Metabolic Adaptation to Weight Loss

- Last at least 12 months (longest studied), probably much longer.
- Seen regardless of how a person loses weight, whether surgical, medical, or lifestyle.
- Likely accounts for large portion of weight regain observed: 85% of people with lifestyle change, 45% with bariatric surgery.
Expected Weight Loss

- Exercise: not expected to cause weight loss.
- Dietary change: 5% over 1 year at a rate of one-half to one pound per week.
- Intensive lifestyle change: 5-10%
- Pharmacotherapy plus intensive lifestyle change: up to 27%
- Bariatric Surgery: up to 30%
Examples - Weight Loss

- Starting body weight: 250 lbs
- Dietary change: 237 lbs
- Intensive lifestyle change: 225 lbs
- Add anti obesity medication: 183 lbs
- Bariatric Surgery: 175 lbs
Benefits of Diet, Exercise, Weight Loss

- Nutrition quality improves metabolic health.
- Fitness improves adipocyte function.
- Weight loss:
  - 3-5%: various health benefits
  - 15%: reversal/remission of early type 2 diabetes
  - 25-30%: reversal/remission of more established type 2 diabetes
Weight Regain Prevention

- National Weight Control Registry, Clinical trials
- Diet: structured, low variety, regimented
- Exercise: >60 minutes per day, most commonly walking
- Restaurant eating: <1 time per week
- Anti obesity pharmacotherapy
- Bariatric surgery revision
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