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Body Weight Regulation:

A Calorie Is NOT A Calorie

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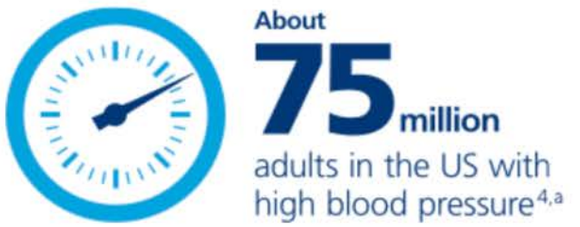
Learning Objectives

- 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.

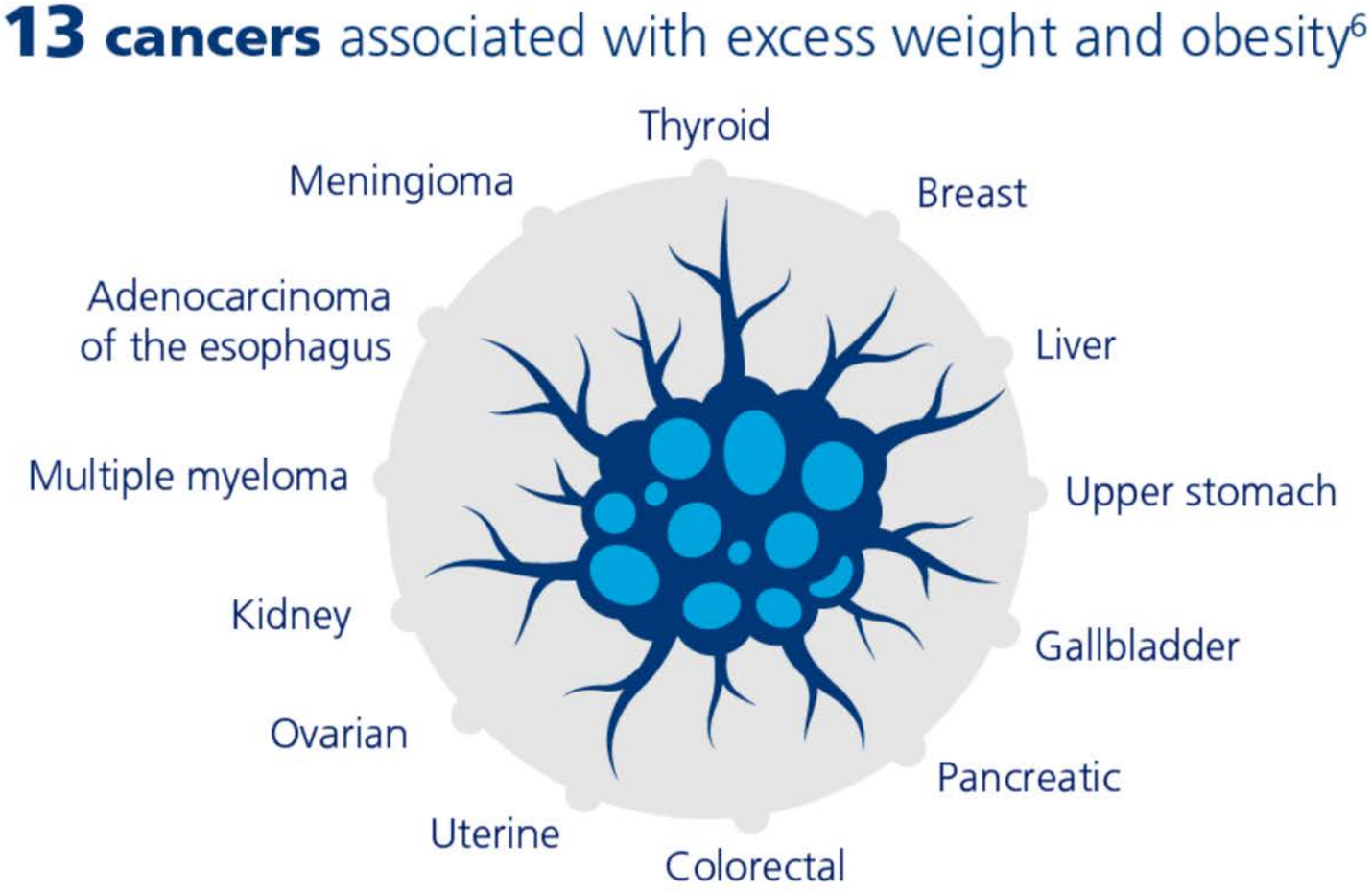
Obesity is a chronic disease affecting 95 million adults. That's more than 3x the number of adults with diabetes.[2,3]

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 40% of all cancers diagnosed in the US have been associated with overweight and obesity



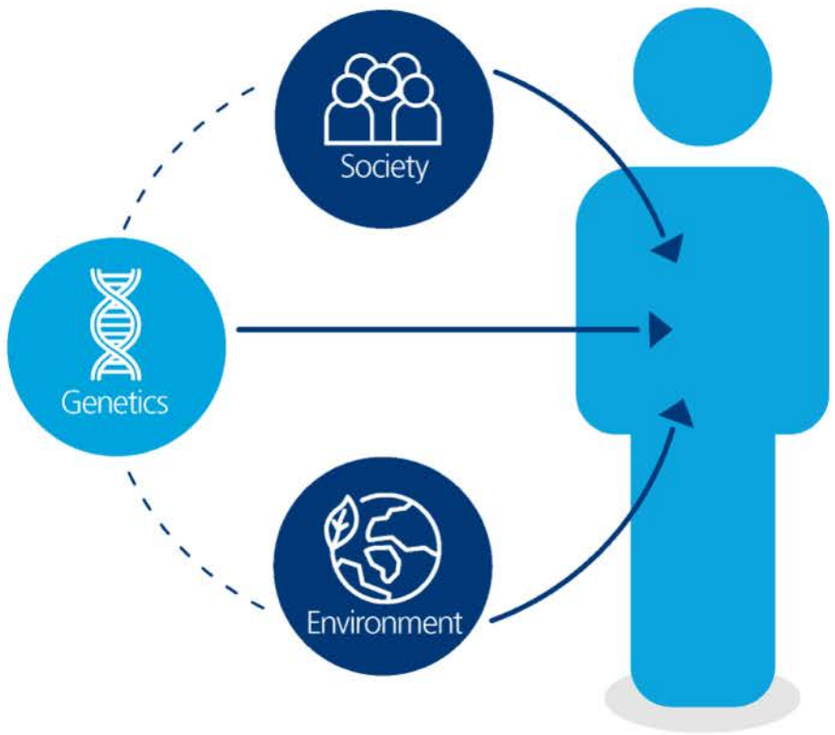
Data from 2014 CDC report.[6]

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]



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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."

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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.

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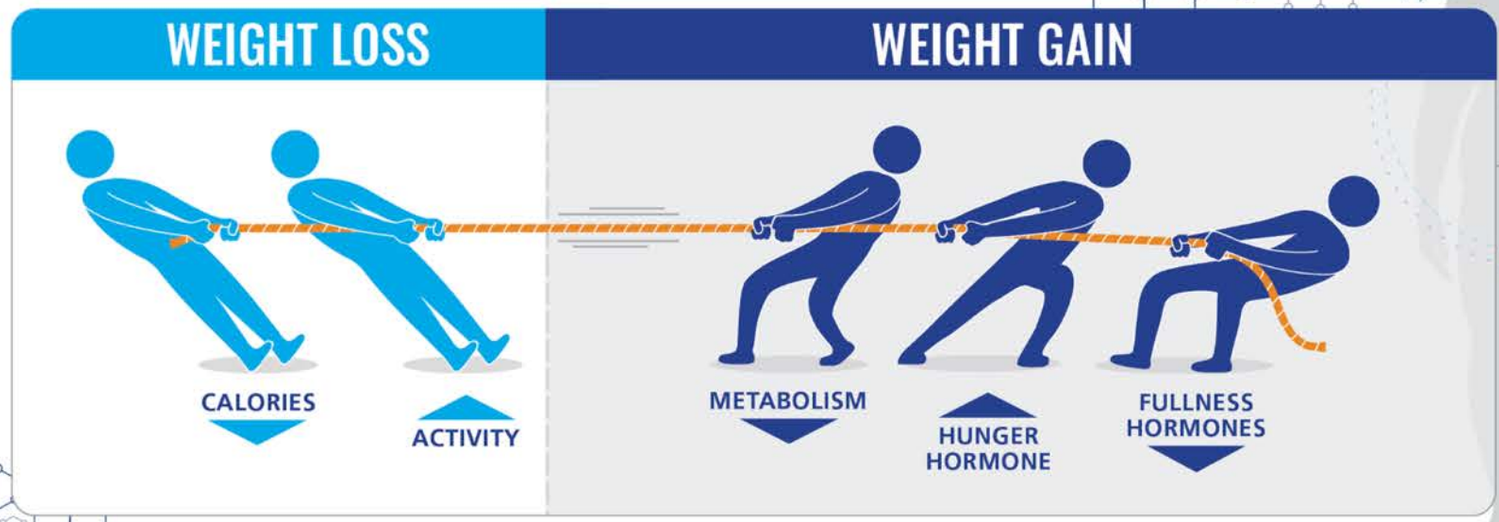
Your Weight Set Point

- 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]).[1,2]

Hunger hormone increases

- Ghrelin

Satiety (fullness) hormones decrease

- Amylin
- Insulin
- Leptin
- GLP-1
- PYY
- CCK

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.[3]

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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.

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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.

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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.

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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%

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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

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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

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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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