The Many Factors Influencing the Obesity Epidemic

Obesity is a complex health condition. Many factors interact to influence it. Such factors include:

- Genetic
- Metabolic
- Behavioral
- Hormonal
- Psychological
- Cultural
- Environmental
- Socioeconomic

Some of these are easier to alter than others. Here's a summary of key factors involved in the obesity epidemic.

Calories galore

- Since the 1970s, American men have increased their daily calorie intake by an average of 210 calories, and women by about 270 calories[1].
- Most of the extra calories have come from high carbohydrate (that is, sugary or starchy) foods and beverages.
- Liquid calories are especially bad for weight control since they do not reduce appetite as much as solid foods.

"Toxic" food environment

- One reason for our increased calorie intake is that we are surrounded by inexpensive, energy-dense food. And it is often sold and served in oversized portions.

- It isn't simply that food companies profit by selling us more food. It is that people have gotten used to the abundance of cheap food and expect to find it everywhere.
- This calorie glut is made possible largely by government subsidies for wheat, soy, and especially corn. These are key ingredients in "junk" food and in feed for cattle and pigs.
- Other contributors to our higher calorie intake include:
    - Increased and cheaper output from factory farming.
    - Improvements in food palatability. Thanks to added sugar, fat, and sodium and manipulating texture and other food qualities.
    - Marketing by the food industry.
- Americans now spend a smaller share of their income on food than any society in history or anywhere else in the world. Yet we get more "empty" calories for it[2].
- This has fueled over consumption of high calorie fare such as:
    - Fast food
    - Corn fed beef and pork
    - Packaged snacks
    - Ready-to-eat meals
    - Soft drinks

Sugar overload

- Americans eat too much sugar.
- Sugar is a major player in the obesity epidemic.
- Sugars found naturally in foods such as fruit (mostly fructose) and milk (lactose) are not the problem.
- The culprit is the sugar liberally added to so many foods. Sugar is added to not only candies and cookies, but also staples like pasta sauces, ketchup, canned baked beans, and breakfast cereals.
- On average, we consume about 90 grams of added sugar a day. That is 22 teaspoons! All that sugar adds up to 350 calories per day. One third of the sugar we consume is from soft drinks.
- The fructose in that added sugar may be a particular problem.
- Research suggests that high intake of fructose can have:
    - Adverse effects on blood cholesterol and triglycerides
    - Worsen blood sugar control that can lead to diabetes
    - Promote abdominal fat gain

Less home cooking

- Longer average work hours and more two worker households mean less time for home cooked meals.
- Meals prepared from scratch tend to be more healthful and lower in calories than packaged or ready-to-eat foods.
- In the past few decades Americans have been eating more meals in restaurants.
- Studies have found that restaurant fare (whether fast food or fine cuisine) tends to be higher in calories than home cooked meals. This is largely because it's served in such oversized portions.
- Not surprisingly, research has linked frequent eating out to increased body weight.

Too much sit-down time

- Americans are much less physically active, on average, than they were in the past. Major culprits include the:
    - Increasingly sedentary nature of many forms of work
    - Dramatically increased time spent sitting in cars, watching TV, and using computers
    - Lack of daily physical activity in most schools
- Burning fewer calories means storing more of them as body fat. And, in turn, obesity and its poor health effects discourage many people from exercising and staying active.
- For most obese people, both exercise and diet are needed for long-term weight loss.

Social norms pull us to opposite extremes

- Your social network is a good predictor of whether you will be obese or not.
- It's not just that obese people hang out together. But also that thinner people who have many obese friends are much more likely to become obese themselves over the long term[3]:
    - Obesity risk increases by nearly 60% when a person has a friend who becomes obese and by about 40% when a sibling or spouse becomes obese.
    - People of the same sex have a greater influence on each other's weight than those of the opposite sex.

Genetics

- Obesity offers a good example of genes interacting with lifestyle and environment.
- It's clear that obesity runs in families:
    - If you have an obese parent, there's a good chance you'll become obese too.
    - With two obese parents, the risk is even greater.
- In part, genes play a large role in aspects of weight regulation, such as metabolic rate. This is the rate at which we burn calories when at rest and during activity.

- Certain genes may also disrupt appetite control systems in the brain. For instance, they can affect signals to the brain about hunger and satiety.

- Scientists have found more than 1,000 genes that affect metabolism and weight-related behavior. This can help explain why:
    - Some people have an easier time staying thin
    - While others continually struggle with weight gain
    - Some people do better on a low-carb diet and others on a low-fat diet
- What you eat and how active you are matter too, of course. However, genetics influence your preferences for various foods and exercise and how your body responds metabolically.

Epigenetics

- Genetics may help to explain why one person becomes fat while another does not. But it doesn't explain the obesity epidemic. Human genetic makeup hasn't changed much during the past few generations.
- Here's where epigenetics comes into play. This involves changes in gene expression that can occur during a lifetime. Such changes are in response to outside influences and can then be passed along to offspring.
- For example, a mother's diet, weight, lifestyle, and environmental exposures before and during pregnancy can cause epigenetic changes that alter her child's risk of obesity.
- Parents also pass on or nurture other weight-related tendencies by example:
    - Eating patterns
    - Attitudes about exercise
- Your place on the social ladder also influences your health, habits, and body weight.
- For example, obesity is more common among poorer people than among the wealthier.

Are gut microbes to blame for bigger guts?

- Research has linked the trillions of microorganisms in our colon to many aspects of our health, including body weight.
- Animal studies have found that the make up of microbial populations in the colon influences:
    - Energy metabolism
    - How carbohydrates and fats are digested
- This in turn affects the risk of obesity.
- These microbes vary from person to person. They are influenced by factors including:
    - Genetic
    - Dietary
    - Environmental
- Some research suggests that antibiotics, especially when given to children, may alter gut bacteria in ways that have long-term effects on body and weight.

Sleep: another reason to get your zzz's

- Many studies over the past few years have linked not enough sleep to an increased risk of obesity in a number of ways.
- Some have found that it can undermine efforts to control weight. People on diets tend to be more successful when they get enough (but not too much) sleep.
- Other studies find that decreased sleep can lead to:
    - Poorer eating habits
    - Greater calorie intake
    - Lower metabolic rate
    - Increased abdominal fat
- But the relationship between sleep and metabolism is complex, and reduced sleep can affect people differently.

Inflammation and insulin resistance

- Chronic inflammation in the body can be both a cause and an effect of insulin resistance and obesity.
- For example, inflammation can contribute to insulin resistance, which in turn may promote obesity.
- Obesity worsens insulin resistance and increases chronic inflammation.
- Inflammation, obesity, and insulin resistance reinforce one another, often resulting in type 2 diabetes.
- Being sedentary and having an unhealthy diet promotes inflammation and insulin resistance, as well as obesity.

References:

1. Earl Ford. American Journal of Clinical Nutrition, April, 2013.
2. Roland Sturm. CA: A Cancer Journal of Clinicians, September, 2014.
3. Nicholas Christakis. New England Journal of Medicine, July, 2007.