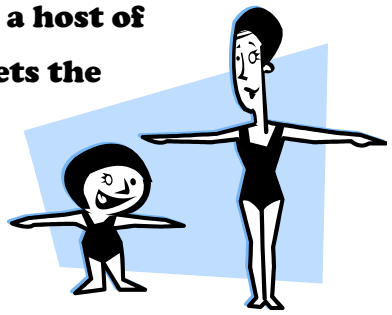
CHAPTER 2

BODY WEIGHT AND OBESITY

Kids come in all different shapes and sizes. As you grow, it's not uncommon for your body to store a little extra fat just before you start a growth spurt. This is normal and healthy. But, when you consistently gain weight faster than you grow upward, it can lead to overweight. Although you don't have to be thin to be fit, a healthy body weight is a key part of good physical condition. Being overweight usually means that your body is storing too much fat. Extreme overweight, known as obesity, leads to a host of health problems for children and teens. It also sets the stage for obesity in adulthood.



The obesity epidemic

Today 2 out of every 10 preschoolers are either obese or at risk for becoming overweight. For older children and teens, the number is 3 in 10. Even more alarming, the number of obese young people has been rising steadily since the 1960s. In the last decade alone there has been a 45% jump in obesity in this age group and there's no sign that the trend will drop off anytime soon. Given that 80% of overweight teenagers grow up to be obese adults, this presents a major health crisis.

Obesity can cause serious physical, social, and emotional problems in children. It is the main reason kids get high blood pressure. It also ups the chances of getting type 2 diabetes, heart disease, and joint problems. Obesity

disrupts hormone levels and sleep cycles as well. For many kids, being overweight damages self-esteem and leads to problems in school and with friends.

Causes of obesity

You naturally gain weight as you grow. When you eat a healthy diet, your muscles, bones, and fat all increase in the right proportions. But, when you take in more calories than you use up, the excess food energy is stored as fat. Over time, this fat builds up, and without changes in your exercise and eating habits, you'll become obese.

There are several factors that affect your food intake and your energy use. Your family environment is a major influence. If one or both of your parents are obese, you have a much higher chance of becoming overweight yourself. This can be partially explained by genetics. But, more importantly, children tend to follow the example set by their parents when it comes to eating and exercise habits. That's why the whole family needs to be involved if you're going to be successful at making lifestyle changes. Another culprit is television. Sitting in front of the screen takes away from time that you could be using to do something active. Plus, TV-watching often goes hand-in-hand high-calorie snack foods.

Your body's set-point

You probably know someone who can eat anything and everything without gaining weight. You also know a person who struggles to diet only to have the pounds creep back on within a few months. Both of these cases illustrate a key

fact about human metabolism. Your body has a weight set-point. This is the weight that your body seems to "remember." Even if you eat more or less than usual for a few weeks or months, your weight will quickly return to your set-point as soon as you eat normally again.

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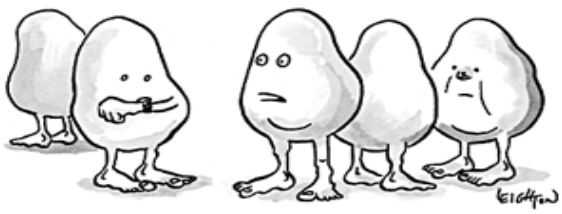

"Ready to head back?"

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Some people have a low set-point. That's why they seem to be able to eat a lot without gaining weight. A low weight set-point comes in handy in our culture where obesity is a bigger threat than starvation. But, that hasn't always been the case. During the long history of the human race, people who could store more fat had the best chance of survival. Their bigger fat deposits allowed them to withstand food shortages. But, in the last 100 years, food has been plentiful. Today, most people never need to dip into their fat reserves because of famine. Also, daily life isn't as physically demanding as it once was. The bottom line is that people burn less energy and store more fat. The ability to use calories efficiently, which once protected our ancestors, now puts us on the fast track to obesity.

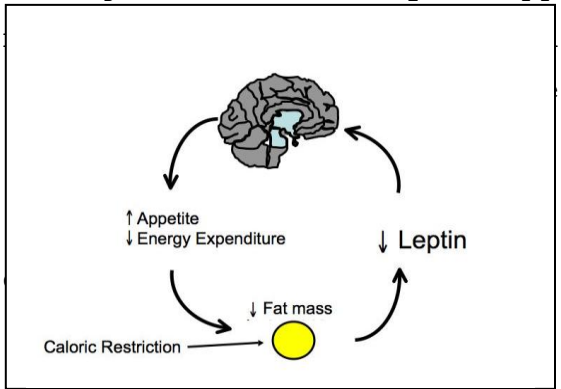
So, does that mean once you're obese, you're doomed to stay at that weight forever? Not necessarily, especially if

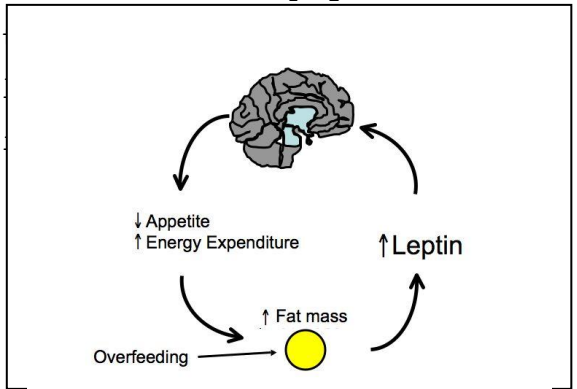
you're still growing. Although it takes work, you can gradually readjust your weight set-point. For children and teens, losing weight, exercising regularly, and practicing good nutrition, will reset your personal set-point so that you can reach and maintain a healthy weight on into adulthood. It is much easier for a child to lose weight and change their set-point than it is for an adult. This is one reason it is so critical for children to adopt a healthy lifestyle as early as possible.

How your brain controls your weight

For years, scientists have grappled with how the body maintains its set-point weight. This research has led to some interesting observations about how your brain and your body fat interact. Fat tissue is not just a passive storehouse for excess food energy. Instead, it is an active player in your metabolism. It turns out that fat cells release hormones that send signals to your brain and other organs. One of these is leptin, a key messenger in the body's appetite control system.

The more body fat you have, the greater the amount of leptin that's circulating in your system. A region of your brain called the hypothalamus monitors your leptin level. If your leptin goes up it means your fat stores have increased. This triggers the brain to send out a series of hormone signals. Your stomach, liver, pancreas, and nervous system get the message to shut down your appetite and rev up your





lower leptin levels signal your appetite to increase and your body to slow down its rate of energy use. When leptin was first discovered, scientists thought they'd found a cure for obesity. They reasoned that giving obese people leptin supplements would jumpstart their bodies into shedding fat. However, this strategy worked only for the small fraction of people who don't make leptin naturally. Most obese people already

Graphic illustration of leptin's effect on metabolism.

have large amounts of leptin circulating in their bodies. The problem is that their brain ignores the hormone's weight-regulating signal. Researchers aren't completely sure why this is the case. One theory is that fatty acids given off by fat cells may block leptin's action. A high-fat diet may also contribute to the problem. Scientists may eventually find a way to overcome leptin resistance but, for now, weight loss, healthy diet, and exercise are the only ways to get your body's fat-control signals working again.

What is a healthy weight?

Your body is made up of water, fat, muscle, minerals and other substances. The number you see when you step on the scale is the sum of these elements, but it's the portion of your body weight that comes from stored fat that matters most to your health. In children, boys are considered obese when fat makes up 25% of their body weight. For girls, obesity is 32% or more of body fat.

It's easy to directly measure your weight and height—all it takes is a scale and a yardstick. Assessing your body fat, however, is not so obvious. Fat is deposited all around your

body, under the skin and around the organs. To solve the problem of measuring body fat, scientists developed the body mass index (BMI). This is a mathematical formula that uses your height and weight to estimate the amount of body fat you probably have. The best way to calculate your own and your child's BMI is to use the simple web page at the Center for Disease Control:

http://www.cdc.gov/nccdphp/dnpa/bmi/calc-bmi.htm

	BMI Categories			
Age (years)	**Underweight**	**Desirable**	**At Risk**	**Obese**
11 to15	Less than 15	15 – 20	20 - 24	25 and over
14 to 17	Less than 17	18 - 23	24 - 27	28 and over
20 and over	Less than 18	19 - 25	26 - 29	30 and over

By matching the BMIs of millions of people to rates illness and death, researchers have linked higher BMI levels (meaning more body fat) to an increased risk of certain health problems. A BMI that is more than 20% higher than the desirable range puts you in the obese category. This chart applies to adults and teens only. Younger children are discussed further below.

Children's body fatness normally changes as they grow. There are also variations in body fat between boys and girls as they mature. For these reasons, it's useful to plot BMI on a special chart which takes into account age and sex. (See *BMI-for-Age charts at the end of the chapter*).

Understanding BMI Categories

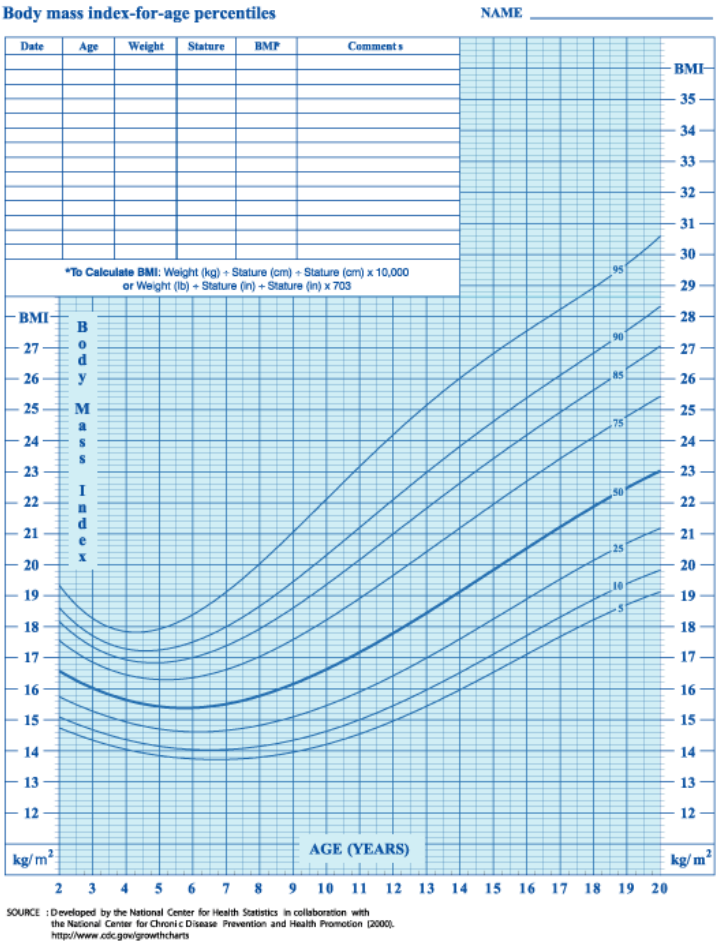
Underweight: Weighing too little for your height can also be a problem. If you fall into this category, you don't have enough stored fat. This puts you at risk for malnutrition and poor resistance to disease. Your diet may be dangerously low in calories, as well as important vitamins and minerals so you should be evaluated by a doctor or dietitian.

Desirable Weight: A BMI in this range is healthy. You aren't at risk for health problems.

At Risk: Our weight is 10% or more above the desirable range. This means you have the potential of becoming obese. You should be checked to see if you have developed any of the health problems associated with obesity such as high blood pressure, high cholesterol, high triglycerides, and diabetes.

Obese: You have an excessive amount of stored body fat. For children and teens, this means a high chance of becoming an obese adult if you don't take steps to treat the problem. You will need to work with a doctor and other health care professionals to get to a desirable weight.

If a child's BMI falls above the 85 percentile (meaning that the child's weight-to-height ratio is higher than 85 out of 100 kids of the same age and sex) the child is at risk for becoming overweight. If the



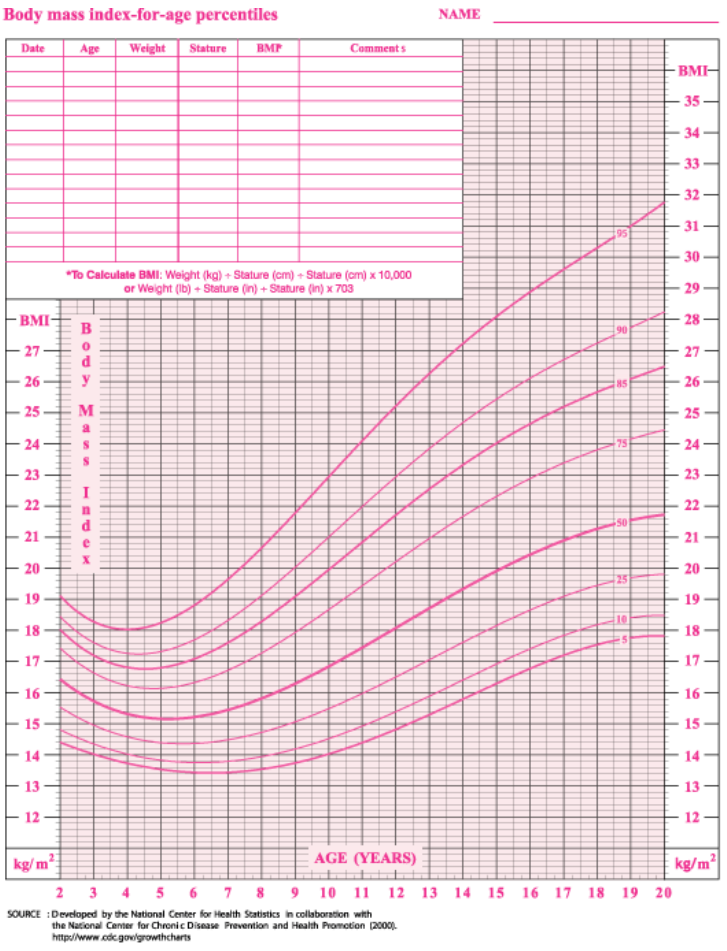
percentile mark, the child

Another important considera
is gaining weight. A few ex
obesity, but a tendency tow
to trouble down the road.
up about one point each yea
between birthdays is a warn
increasing faster than heig
plot a child's BMI over a n
spot weight-gain trends.
BMI is a good way to get a
doesn't take into account i
type. For example, a muscle

average-build person may weigh the same and have the same BMI. The more muscular person, however, will have a lot less body fat. The most accurate way to diagnose obesity is by taking physical measurements that assess the ratio of body fat to lean tissue. The process involves using a tool called a caliper to measuring the thickness of a fold of skin at various points on the body including the abdomen, upper arm, and back.

To better understand BMI-for-age, let's look at the cases of Jack and Jill. (In the next chapter, *Nutrition and Weight Control*, we'll look at food choices each of these teens needs to make to reach and maintain a healthy weight.)

Jack. At age 12, Jack was 5 feet tall and weighed 109 pounds with a BMI just above 21. Although his BMI was at the 85 percentile putting him at risk for overweight, he was not yet obese. By his next birthday, however, he had gained 30 pounds and grown 2 inches taller. Now his BMI was almost 26, putting him at the 95 percentile mark for boys his age and making him obese. Also significant is the fact that Jack jumped more than 4 BMI units. If his weight gain continues climbing at this rate, he will become severely obese by the time he is an adult.



Jill. Jill is 15 years old. Last year she was 5'3" and 130 pounds and her BMI was over 24. She too was above the 85 percentile for girls her age, therefore in the *At Risk* category for overweight. However, unlike Jack her rate of weight gain slowed down. She gained just 5 pounds this year and grew 1 inch taller. This puts her BMI at a desirable 23.

Treating obesity

When tackling obesity, your first goal is to develop healthy eating and exercise habits. All these changes will take time. Making small changes that you stick with beats taking on too much—and giving up in frustration! Remember, you are overcoming years of unhealthy behaviors and attitudes.

This manual can help you with the behavior changes you'll need to make. In chapters to come, you'll learn the basics of good nutrition and how to build a healthy eating plan. You'll also find information on the benefits of physical activity and ways you can make exercise a regular part of your life.