

# 100

# QUESTIONS & ANSWERS

What are the risk factors for obesity in my child?

○○○○

How much of obesity is due to environment and social conditions?

○○○○

When should we seek medical advice for our child's weight problem?

○○○○

How do we set the balance for less food and more activity and exercise?

○○○○

What is the yo-yo effect in dieting?

*About*

## Your Child's Obesity



*by*

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# **100 Questions & Answers About Your Child's Obesity**

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## Dedication

To our parents (who fed us well, perhaps too well).



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**Questions 1–10** define what a normal weight is and how to determine whether your child is obese:

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- I heard that waist circumference is important. What does it mean if my child has a large waist size?

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You have heard it from the medical profession and have seen it on television, in the street, and at school (and it is true): An epidemic of obesity is striking children and adults in America, and it is taking its toll on our health.

The percentage of obese and overweight preschool children (2 to 5 years old) and adolescents (12 to 19 years old) has doubled, and for children 6 to 11, the percentage has tripled in the last 30 years. About 9 million children over 6 years old are obese, and many more are overweight. This can be physically dangerous for children, as they can develop diabetes, high blood pressure, and other diseases. Being overweight can also produce pressure, teasing, bullying, depression, and other social problems for a child, as “thin = attractive” and “fat = ugly.” Society pays with time lost from work and school, mounting health expenses caused by obesity, and other direct and indirect costs.

No one really doubts that this is a problem. Unfortunately, no magic or easy answers are available. We, both as a society and as individuals, need to eat better and less and exercise more. That really is the take-home message of this book. The answer for the child who is overweight or obese lies with the child and his or her family. This book is an attempt to help you and your child handle excess weight.

Your child (and you, if you are too heavy) can get to a normal weight, but this takes self-control, hard work, and a change in lifestyle that is not just for 6 weeks or 6 months; instead, it is forever. The advice in this book is straightforward and simple (but not easy): Eat the appropriate number of calories per day of balanced food and increase exercise.

Your child's health and life are at stake.

We give special thanks to an old and wonderful friend, Steve Shifrinson of the Marlboro, New Jersey school system, who helped with many of the school-related aspects in this book.



# *Definitions and Measurements*

What is the “normal” weight of a person? How is it determined?

If height matters, then how do you account for height in finding a normal or healthy weight?

I heard that waist circumference is important. What does it mean if my child has a large waist size?

*More . . .*

## ***1. What is the “normal” weight of a person? How is it determined?***

The normal (perhaps a better term is “healthy”) weight for an individual is actually a function of age, gender, and height. Charts published by the U.S. Centers for Disease Control (CDC) represent the weights and heights for American children. Most of these charts show the healthy weight for a child, although some are actual measurements of weights of children in the United States and represent the “real” weights but not necessarily healthy weights. Several of the charts are included in Appendix B of this book. A complete set of charts from the CDC is available at: <http://www.cdc.gov/growthcharts>.

Online calculators are also available to do the math for you. This calculator will take your child’s gender, age, height, and weight and give you the percentile that he or she is now and what the “ideal” body weight should be: [http://pediatrics.about.com/cs/growthcharts2/1/bl\\_ibw\\_calc.htm](http://pediatrics.about.com/cs/growthcharts2/1/bl_ibw_calc.htm).

The data in the charts are arranged by age and gender and are placed into “percentiles.” A percentile is the percentage of the population that weighs a given amount or less. Table 1 shows some examples in graph form.

For example, look at the 10-year-old boy line that is highlighted. If your son weighs 55 pounds, then 5% of all other boys weigh less than he does and 95% weigh more. If he weighs 71 pounds, then half weigh more and half weigh less. If he weighs 102 pounds, then only 5% weigh more and 95% weigh less.

As you can see from this chart, boys and girls weigh roughly the same until the age of 10, or so, when the boys start getting bigger than the girls. These are not

**Table 1 Weight percentiles for children.**

Percentile	5%	10%	25%	50%	75%	90%	95%
Boy, 5 years	33	35	38	40	44	48	51
Girl, 5 years	32	33	35	39	44	48	51
Boy, 10 years	55	57	63	71	80	93	102
Girl, 10 years	53	57	63	72	83	96	106
Boy, 15 years	94	99	110	124	140	159	173
Girl, 15 years	89	94	102	114	129	151	165

If your 10-year-old son weighs 55 lbs., 5% of other boys his age weigh less and 95% weigh more. If he weighs 71 lbs., half weigh more and half weigh less. If he weighs 102 lbs., only 5% weigh more and 95% weigh less.

normal weights, but the actual weights of American children, as measured by the CDC and published in 2000. Many authorities feel that on the average, Americans are too heavy. Thus, these chart weights may be too high for optimal health.

## *2. If height matters, then how do you account for height in finding a normal or healthy weight?*

Yes, height matters. The charts and calculator previously noted account for height.

An easy way to find the healthy weight for your child has been developed and takes into account both weight and height. It is called the **body mass index (BMI)**. The calculation is a bit complex. It is figured by taking the weight in kilograms (kg) divided by the height in meters squared ( $m^2$ ). This works easily in the metric system but is a little more complicated in the pounds/inches American system.

### **Body mass index (BMI)**

A number calculated from height and weight that is used to determine whether a person is in the "normal" weight, underweight, overweight, or obese range.

The formula is as follows:

$$\text{BMI} = \frac{\text{weight (pound)} \times 703}{\text{height squared (in}^2\text{)}}$$

### Fat

See also lipids. One gram of fat contains and produces nine calories of energy. As an adjective and colloquially, it refers to being overweight or obese.

### Diabetes mellitus

A complex disease of small blood vessels and glucose metabolism. It is manifested by elevated levels of sugar (glucose) in the blood. Long-term adverse consequences include kidney failure, cataracts, poor circulation leading to heart attacks, strokes, leg ulcers, and other serious problems.

### Cholesterol

A fat (lipid) that is an essential part of the membranes of cells. It is made by the body as well as ingested with food. It is a steroid and is necessary for life, but an excess can produce atherosclerosis leading to vascular and other diseases including heart attacks and strokes.

For example, the BMI of a child who is 5-feet and 1-inch (61 inches) tall and weighs 105 pounds would be calculated as:

$$\text{BMI} = \frac{105 \times 703}{61 \times 61} = \frac{73,815}{3,721} = 19.8$$

An easier way to find this is by using an already created calculator (see the Resources for some online examples).

The BMI is not in and of itself a measure of **fat** in the body. Other, more complicated ways of doing that, including measuring skin-fold thickness, are available (see Question 8). Nonetheless, the BMI for most people is a very good tool for evaluating excess weight (see Question 6).

### *3. I heard that waist circumference is important. What does it mean if my child has a large waist size?*

Excessive abdominal (stomach, belly) fat has a worse health prognosis than fat distributed elsewhere on the body. A male with a waistline over 40 inches or a non-pregnant female with a waist of more than 35 inches is at a higher risk of developing such medical conditions as **diabetes mellitus**, elevated **cholesterol** and **triglycerides**, **hypertension**, and **coronary artery (heart) disease**. Thus, it is not just the weight that matters, but also the weight distribution. Weight around the waist is worse than excess pounds in, say, the legs.

**Metabolic syndrome** is a condition that is sometimes seen in adults. This is cluster of risk factors for heart disease and stroke and includes the following:

- Excess abdominal fat
- Abnormal blood **lipids** (fats), including high triglycerides, decreased **high-density lipoprotein (HDL) cholesterol**, and elevated **low-density lipoprotein (LDL) cholesterol**
- **Insulin** resistance/high blood sugar
- High blood pressure
- Elevated markers of inflammation such as blood C-reactive protein

The key problems with the metabolic syndrome are **obesity** and insulin resistance. It is estimated that 50 million people in the United States have this syndrome, which the American Heart Association defines as follows:

- Waistline: men  $\geq 40$  inches (102 cm) and women  $\geq 35$  inches (88 cm)
- Elevated triglycerides  $\geq 150$  mg/dL
- Reduced HDL (“good”) cholesterol: men  $< 40$  mg/dL and women  $< 50$  mg/dL
- High blood pressure  $\geq 130/85$  mm Hg
- Elevated fasting blood **glucose**  $\geq 100$  mg/dL

Key to treating this is prevention of obesity in children.

After a person has this syndrome, the goals are to lose weight, treat the elevated blood pressure and sugar, increase exercise, and go on a diet low in saturated and **trans fats** and cholesterol.

#### **4. My son's BMI is 19.8. What does this mean?**

Here is how to interpret the BMI:

- Underweight =  $< 18.5$
- Normal weight =  $18.5\text{--}24.9$
- **Overweight** =  $25\text{--}29.9$
- Obesity = BMI of 30 or greater

#### **Triglycerides**

Lipids or fats composed of three molecules of fatty acid attached to one molecule of glycerol. Elevated levels have been associated with the development of serious medical diseases.

#### **Hypertension**

An elevation of the pressures in the heart and arteries, which can lead to severe disease including heart attacks and strokes. Also called high blood pressure.

#### **Coronary artery (heart) disease**

A disease of the arteries of the heart in which the deposition of plaque (cholesterol, calcium, and other compounds) progressively blocks the flow of blood to the heart, which can lead to chest pain (angina pectoris) and myocardial infarction (heart attack).

**Metabolic syndrome**

A medical condition that is a collection of risk factors for serious disease (including diabetes, heart disease, and stroke). The risk factors include high blood (serum) fat/lipid levels, insulin resistance, high blood pressure (hypertension), and elevated markers of infection seen by doing certain blood tests.

**Lipids**

Fats found in the body and measured in the blood. They include HDL ("good") and LDL ("bad") cholesterol as well as triglycerides. Lipids are one of the three main sources of energy for the body and a building block for many cells. The chemical definition is a solid, greasy carbon-based material.

**High-density lipoprotein (HDL) cholesterol**

"Good cholesterol." The lipoproteins help carry the cholesterol to the liver for excretion from the body.

**Low-density lipoprotein (LDL) cholesterol**

"Bad cholesterol." Lipoproteins help to carry the cholesterol from the liver to the rest of the body.

This means that your son has a normal (healthy) weight for his height because his BMI is 19.8. It falls in the 18.5 to 24.9 range.

Appendix B shows BMI charts that are similar to the height and weight charts referred to in Question 2. By using those charts (Page 164), you will find that this BMI for a 15-year-old boy places him in the 50th percentile (one-half of boys have higher BMIs, and one-half have lower BMIs).

It is easier just to calculate the BMI using the formula or calculator. Then you do not have to worry about age and gender.

**5. What is the difference between being "obese" and being "overweight?"**

In the past, there has been some confusion about terms such as obesity, risk of obesity, overweight, **morbid obesity**, and others. This subject has become much clearer because of a major review of the subject of childhood obesity done by an expert committee under the auspices of the American Medical Association and two parts of the U.S. Health and Human Services Department: the Health Resources Service Administration and the CDC. They reviewed the entire subject of childhood obesity and made recommendations in December 2007 in the journal *Pediatrics*, published by the American Academy of Pediatrics (see Resources). The first objective of the committee was to standardize the definitions used.

Being obese or overweight means having too much body fat compared with the normal or healthy weight. Because a healthy weight is also a function of height, the definitions used now are based on the BMI, which,

**Table 2** Healthy range of BMI.

Status	BMI Percentile Range	BMI numbers
Underweight	< 5%	< 18.5
Healthy	5% to 85%	18.5 to 24.9
Overweight	85% to 95%	25 to 29.9
Obese	> 95%	≥ 30
Extreme obesity	> 99%	> 40

as noted previously, is a number calculated from weight and height. Table 2 shows the healthy range of BMI to be in the percentile range of 5% to 85%, corresponding to BMIs between 18.5 and 24.9.

Overweight, using this definition, is a BMI of 25 to 29.9. By using the calculator or tables, you can then take your child's height to see where the cutoff weight is for the healthy category.

You or your child's doctor can use the CDC tables to calculate your child's status. For example, if your son is 8 years old, 49 inches (4 feet 1 inch) tall and weighs 100 pounds, his BMI is 29.3. He is overweight.

Now looking at the table for boys in Appendix B, you will see that the 25th percentile for his age and height is 50 lbs. That is, 1/4 of all boys weigh less than 50 lbs. and 3/4 weigh more. Continuing:

The 50th percentile is 55 lbs.

The 75th percentile is 64 lbs.

### **Insulin**

A hormone that helps to regulate blood sugar by lowering it. Insufficient insulin or lack of sensitivity to insulin can produce the disease diabetes.

### **Obesity**

The condition of being heavier (or having a higher BMI) than overweight and significantly heavier than normal weight. Obesity is defined as a BMI of 30 or higher.

### **Glucose**

A simple sugar (carbohydrate) found in the body and easily measured in the blood.

### **Trans fats**

A specific type of fat—usually solid rather than a liquid or oil—that is made by adding hydrogen to liquid fat. Excess trans fats have been implicated in the development of heart disease and other health problems.

### **Overweight**

A body mass index of 25 to 25.9, which is greater than the normal weight (or body mass index) but less than the obese weight range.

**Morbid obesity**

At the upper end of the obese weight range. A body mass index of greater than 35 or 40 (this is not fully standardized). Also, massive or extreme obesity.

The 90th percentile is 72 lbs.

The 95th percentile is 77 lbs.

So, at 100 lbs., he is heavier than 95% of all boys his age and height—this is too much. To get down to the area you want to realistically be at, between roughly 50% and 95%, he would need to drop his weight from 100 lbs. to below 77 lbs. and ideally to around 60 lbs. The available tables can be difficult to use and the ideal weight and BMI for your child may be complex to calculate, but using an online calculator (see the Resources for examples) can give you a quick and easy answer.

## 6. What is “morbid obesity?”

Several other terms are used in the medical literature to define and classify excess weight. They have not been fully standardized. They revolve around the BMI and are included in Table 3.

**Table 3** Terms used to define and classify excess weight.

BMI	Classification	Other Terms
< 18.5	Underweight	
18.5 to 24.9	Normal	
25 to 29.9	Overweight	
30 to 34.9	Obese—Class I	
35 to 39.9	Obese—Class II	
> 40	Obese—Class III	Severe Obesity
40 to 40.9		Morbid Obesity
> 50		Super Obesity

So morbid obesity, super obesity, or severe obesity represent the patient with the heaviest weight and the greatest risk of severe health problems. “Morbid obesity” is an old term and tries to capture the idea that this excess weight is a risk to health and may even be life threatening.

***7. Maybe my son is just a bit short and is slow in developing? Do we have to worry now, or can we wait a bit?***

It is certainly possible that your son is just in a slow patch of his growth and development and that he will sprout up at some point and drop to a normal weight for his height. You really cannot presume, however, that this will happen. Thus, you should act now if your son is overweight or obese.

A lot of work has been done on fat cells, and how they grow, develop, multiply, and turnover is very important in weight and obesity. Although the work is somewhat controversial and contradictory, the evidence on fat cells supports the notion that obesity as a child produces weight problems in later life. More fat cells are created in children who are obese than in those who are slim. Thus, a child who is fat will have more fat cells throughout life and will have more trouble maintaining a healthy weight. The message is this: Don't let your child become fat because he or she is more likely to remain heavy throughout his or her life.

Data suggest that only 10% of normal-weight kids become obese or overweight adults, whereas about 75% of fat children become or remain fat as adults.

Being heavy can produce some physical problems (see Question 25) that may disappear or lessen if your

child's weight becomes normal. Thus, it is not a good idea to wait to see whether your heavy child has a growth spurt and drops to a healthy weight. Instead, get his or her weight down to a good level now.

**8. My child is “big boned” (i.e., muscle not fat). Why would he be considered overweight or obese?**

That may indeed be the case if your child is very muscular and works out, but some of that muscle may actually be fat. As noted, the BMI does not measure body fat, and your child might benefit from a measurement of body fat. Several techniques are available to measure actual body fat compared with the BMI. These include skin-fold thickness, underwater weight, **bioelectrical impedance**, and others.

**Bioelectrical impedance**

A highly accurate way to measure a person's body mass. A small electric current, which flows at different rates through fat and fat-free tissues, is sent through the body. When factors such as height, weight, and gender are analyzed with the results, a measure of a person's body fat can be obtained.

**Adipose**

Fat cells. There are two types: white and brown.

One common, easy, and noninvasive technique is the skin-fold measurement. In this technique, a special instrument is used to measure several sites (e.g., triceps, biceps, abdomen, thigh, and calf) on the body. The skin is pinched into a double layer that includes fat (**adipose**) tissue but not muscle. The thickness is measured at each site. Because special calipers (that must be kept calibrated) and some training in their use are required for consistency, not all pediatricians will perform this test. They may refer you to a fitness or obesity specialist or clinic for measurement.

If, after this measurement, your son has a normal and acceptable level of body fat, there may be no issue with weight. If his BMI and body fat are elevated beyond healthy, however, then we cannot say that he is just “big boned.”

LeVon's father:

*LeVon is 12 years old and already weighs more than all of his friends. He's very athletic and plays football at school. He's young and still growing and wants to be an offensive guard on the high school football team when he's old enough. He is serious and does well in his classes. I think he'll do fine. He's strong, big boned, and works out a lot. LeVon is not too tall or fast, and that's why he wants to be a guard. He's a great eater, is not picky, and will eat anything we put in front of him. He loves fried food and barbecue, which is very popular here, but he also eats fruits and vegetables. The school nurse told us at the beginning of the year that she was a bit concerned about his weight. We said that he's just big boned, but she said that she was concerned that he is too heavy for his age and height and that not all of his weight is muscle but also fat. That is true, as he does have a "spare tire" around his waist, but for a football guard position, that's good. We're not sure what to do because he is a great kid and is doing fine.*

### **9. How much body fat should my child have, and what is normal?**

Broadly speaking, two types of body fat exist: essential fat and storage fat. The body cannot be "fat free." Fat is a normal, necessary component of cells. Cholesterol and triglycerides, for example, are lipids that are required for life but in excess can produce major problems in blood vessels, the heart, and elsewhere. This is essential fat and, in the normal, healthy adult female, makes up about 12% of body weight and in men about 3%. Although unfair, this is the way the body is made.

Storage fat is a way the body stores or stockpiles energy for future use. It is under the skin and inside the body around many organs. Everyone needs a certain amount