

Understanding Childhood Obesity



An Epidemic of Excess

Obesity has gone prime time as an American health issue. It's in every neighborhood, every mall, every school and every workplace.

Obesity is more than a cosmetic concern. It doesn't just impact the way we look. It can change the course of our lives, and not for the better. It sets us on a fast track for health complications such as heart disease, type 2 diabetes, high blood pressure and high cholesterol. And it's not just a problem for adults. It has also emerged among teens and children, and it is becoming more prevalent every day. For far too many young people, excess weight threatens their future and their quality of life.

But there's good news: Obesity can be stopped. And it doesn't take high-tech treatments or cutting-edge medications. The solution begins and ends with the daily decisions we make.

The American Heart Association has developed this booklet to show how extensive the obesity problem has become — particularly in children — why this problem is dangerous and how you can fight back. We hope this booklet helps you take action and helps us reach our goal for nation's health: To improve the cardiovascular health of all Americans by 20 percent and reduce deaths from cardiovascular diseases and stroke by 20 percent, all by the year 2020.

How bad is it?

- *About one in three children and teens in the U.S. is overweight or obese.*
 - *Overweight kids have a 70–80 percent chance of staying overweight their entire lives.*
 - *Obese and overweight adults now outnumber those at a healthy weight; nearly seven in 10 U.S. adults are overweight or obese.*
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Today, about one in three American kids and teens is overweight or obese, nearly triple the rate in 1963. Even our nation's infants and toddlers are affected. Nearly 14 percent of preschool children ages 2 to 5 were overweight in 2004, up from 10 percent in 2000.¹ More than one-third of children ages 10–17 are obese (16.4 percent) or overweight (18.2 percent).² Nationally, 12 percent of high school students are obese and nearly 16 percent are overweight.³ And almost 10 percent of children under the age of 2 are overweight.⁴

With good reason, childhood obesity is now the No. 1 health concern among parents in the United States, topping drug abuse and smoking.⁵ Among children today, obesity is causing a broad range of health problems that previously weren't seen until adulthood. These include high blood pressure, type 2 diabetes and elevated blood cholesterol levels. There are also psychological effects. Obese children are more prone to low self-esteem, negative body image and depression.

Excess weight at a young age has been linked to higher and earlier death rates in adulthood.⁶ In fact, obese children as young as age 3 show indicators for developing heart disease later in life.⁷ Overweight adolescents have a 70 percent chance of becoming overweight adults. This increases to 80 percent if one or both parents are overweight or obese.⁸ Perhaps one of the most sobering statements about the childhood obesity epidemic came from former Surgeon General Richard Carmona, who characterized the threat as follows:

"Because of the increasing rates of obesity, unhealthy eating habits and physical inactivity, we may see the first generation that will be less healthy and have a shorter life expectancy than their parents."⁹



A Growing Problem

Between 1971–1974 and 2007–2008:¹⁰

- For children ages 2–5, the prevalence of overweight increased from 5.0 to 10.4 percent.
- For those ages 6–11, the prevalence increased from 4.0 to 19.6 percent.
- For those ages 12–19, the prevalence increased from 6.1 to 18.1 percent.

Rates of severe childhood obesity have tripled in the last 25 years, putting many children at risk for diabetes and heart disease. Severe childhood obesity is a new classification for children. It describes those with a body mass index that is equal to or greater than the 99th percentile for age and gender.

For example, a 10-year-old child with a BMI of 24 would be considered severely obese, although this is an adult’s normal BMI. Research found that the prevalence of severe obesity more than tripled (from 0.8 percent to 3.8 percent) from 1976–80 to 1999–2004. Based on the data, there are 2.7 million children in the U.S. who are considered severely obese.

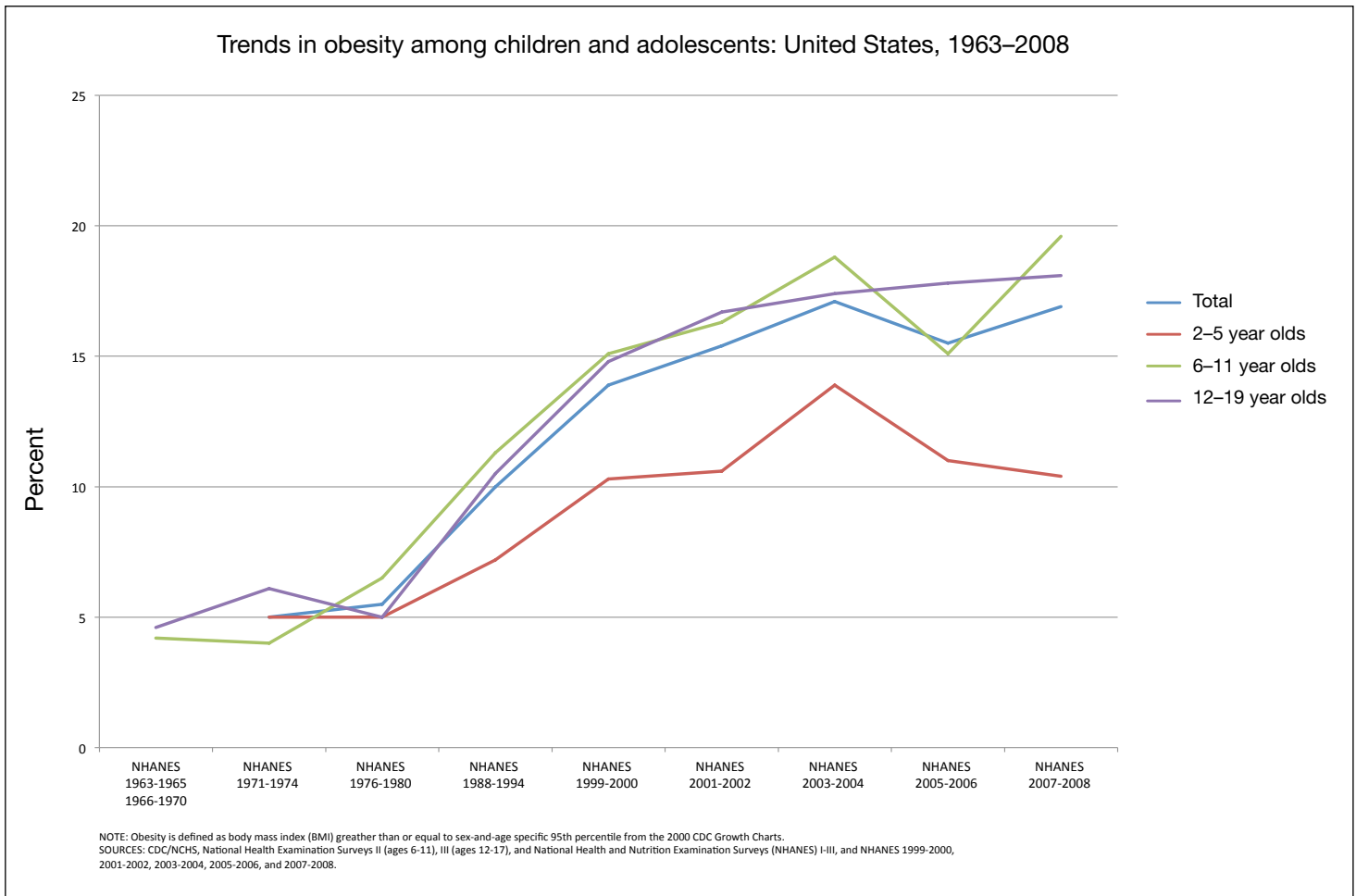
Researchers also looked at the impact of severe obesity and found that a third of children in the severely obese category were classified as having metabolic syndrome, a group of risk factors for heart attack, stroke and diabetes. These risk factors include higher-than-normal blood pressure, cholesterol and insulin levels.¹¹

Obesity has also risen dramatically in adults. Today more than 149 million Americans, or 67 percent of adults age 20 and older, are overweight or obese (BMI at or above 25). That is nearly seven out of every 10 adults. Of these, half (75 million) are classified as obese (BMI at or above 30).¹² Obese Americans now outnumber overweight Americans, which means people who are above a healthy weight are significantly above a healthy weight.¹³ Some experts project that by 2015, 75 percent of adults will be overweight, with 41 percent obese.^{14, 15} In fact, a group of mathematical researchers predicts that adult obesity rates won’t plateau until at least 42 percent of adults are obese in 2050.¹⁶

Among adults, obesity was associated with nearly 112,000 excess deaths relative to normal weight in 2000.¹⁷

The American Heart Association recognizes the tremendous toll obesity is taking on the health of our nation. For the first time, the association has defined what it means to have ideal cardiovascular health: the presence of seven health factors and behaviors that impact health and quality of life.

The American Heart Association will use this definition to achieve our landmark national goal: *By 2020, to improve the cardiovascular health of all Americans by 20 percent while reducing deaths from cardiovascular diseases and stroke by 20 percent.*



What does it mean to be Obese or Overweight?

Overweight and obese are screening labels used for ranges of weight that are above what is generally considered healthy for a given height and may increase the risks for certain diseases or health problems. Overweight and obese are defined differently in children and adults because the amount of body fat changes with age. Also, body mass index in children is age- and sex-specific because body fat differs based on growth rates and developmental differences in boys and girls.

Definitions for Adults

For adults over age 20, overweight and obesity ranges are determined by using weight and height to calculate a number called the body mass index, which usually correlates with a person's body fat.

For adults, BMI is calculated by dividing body weight in pounds by height in inches squared, then multiplying that number by 703.

$$\text{BMI} = \frac{(\text{Weight in Pounds})}{(\text{Height in inches}) \times (\text{Height in inches})} \times 703$$

For adults over age 20, BMI values of:

- Less than 18.5 are considered underweight.
- 18.5 to less than 24.9 are considered normal weight.
- 25.0 to less than 29.9 are considered overweight.
- 30.0 or greater are considered obese, or about 30 pounds or more overweight.
- Extreme obesity is defined as a BMI of 40 or greater.

Definitions for Children

Age- and sex-specific growth charts are used to calculate BMI in children and teens (ages 2–20). These charts use a child's weight and height, then match the BMI to the corresponding BMI-for-age percentile for that age and sex. The percentile shows how a child's weight compares to that of other children of the same age and gender. For example, a BMI-for-age percentile of 65 means the child's weight is greater than that of 65 percent of other children of the same age and sex.

Children and teens whose BMI-for-age is:

- In the 95th percentile or higher are considered obese.
- Between the 85th and less than the 95th percentile are considered overweight.
- Between the 5th and less than the 85th percentile are considered normal weight.
- Below the 5th percentile are considered underweight.

It's important to remember that BMI is a tool. It may not always accurately describe weight classification for some people such as athletes, so a doctor or healthcare professional should make the final determination.



Take Action!

Find out if you or your children are at risk for health problems. Visit the Centers for Disease Control and Prevention's free online BMI calculators for adults and children at <http://www.cdc.gov/healthyweight/assessing/bmi/>. Knowing your risk is the first step!

Causes of Obesity

There is no one cause of obesity. It can be influenced by lifestyle habits, environment and genetics. But, in the majority of cases, it boils down to a pretty simple equation: *We are taking in more calories than we are burning.*

Some common issues leading to this calorie imbalance include:

Portions Are Growing: Portion sizes have increased, especially when we eat away from home. “Value menu” items are all the rage. Although we consider these a bargain, they’re a bad deal when it comes to good health.

Poor Nutrition: Our eating habits have led us to a kind of modern-day “malnutrition.” Many of us fill up on “empty calories” or foods with little nutritional value. These choices are often high in saturated fat, *trans* fat, cholesterol, sodium, added sugars and calories but low in the nutrients we need to be healthy and strong. At the same time, we’re ignoring healthy options such as a variety of fruits and vegetables, fish (preferably oily), lean meat and poultry without skin, fiber-rich whole grains, legumes, nuts, seeds and fat-free or low-fat dairy products.

Eating Out More: Unhealthy food and beverage choices can be found all around us, in places such as fast-food restaurants, vending machines and convenience stores. These options are ready-made and fit our on-the-go lifestyles.

Moving Less: Almost one in four children do not participate in any free-time physical activity.¹⁸ Additionally, the average American child spends four to five hours in front of the TV, computer or video games every day.¹⁹

Bigger Portions

So what does it all mean?

- Americans are eating more.
- Portions have grown dramatically.
- People eat more when served bigger portions.

Portion Size Affects How Much People Consume

Today, food-service establishments are offering us a lot more for our money than they used to. And we’re taking them up on it. For example, 20 years ago an average serving of fries was 2.4 ounces (see table on page 5, “Portion Sizes: Then and Now”). Today it’s 6.9 ounces. An average cheeseburger had 333 calories. Today it’s 590. To put these calorie increases into perspective, between 1971 and 2000 the average American adult consumed 250 to 300 more calories every day. That adds up to 26 to 31 pounds in just one year. Kids are also getting more calories than they need. Adolescents today eat on average 8 percent more than 30 years ago.²⁰

Even packaged and convenience food portion sizes have been increasing since the 1970s. Portion sizes have continued increasing to the point where today most exceed federal serving size standards.²¹ Studies show that when offered larger portion sizes, people eat more.

Bigger portions can seem like a great bargain, but if larger portions are put on the plate, we eat more. This means we’re getting more calories, which leads to increased body weight.^{22, 23}

Did you know that a surplus of about 3,500 calories results in a one-pound weight gain? A daily surplus of 110–165 calories can cause a 10-pound weight gain in a year.²⁴

Some evidence suggests that people may not even be aware when they are served an increased portion size, and that they experience similar levels of fullness after being served a smaller portion size. Studies show that people eat almost 30 percent more when offered the larger portion.²⁵

Take Action!

Taking in fewer calories by controlling portions is a critical step in managing weight. Learn proper serving sizes and pay attention to the Nutrition Facts panel on foods. Teach kids to focus on their own fullness rather than rewarding them for eating whatever is set before them or “cleaning their plates.” Studies show that kids who learn to listen to their bodies will eat less than those who are taught to clean their plates.²⁶

Portion Size vs. Serving Size Defined²⁷

Portion size is the amount of a single food item served in a single eating occasion, such as a meal or a snack. Many people confuse portion size with serving size, which is a standardized unit of measuring foods — for example, a cup or ounce — used in dietary guidance, such as the Dietary Guidelines for Americans. Portion size is the amount offered to a person in a restaurant, the amount offered in the packaging of prepared foods or the amount a person chooses to put on their plate.

For example, bagels or muffins are often sold in sizes that constitute at least two servings, but consumers often eat the whole thing, thinking they have eaten one serving. They don’t realize that they have selected a large portion size that was more than one serving.

Portion Sizes: Then and Now

Food	20 Years Ago		Today		Difference
	Size	Calories	Size	Calories	
Bagel	3-inch diameter	140	6- inch diameter	350	210
Cheeseburger	1 burger	333	1 burger	590	257
Cheesecake	3 ounces	260	7 ounces	640	380
Chicken Caesar Salad	1.5 cups	390	3.5 cups	790	400
Chicken Stir Fry	2 cups	435	4.5 cups	865	430
Chocolate Chip Cookie	1.5-inch diameter	55	3.5-inch diameter	275	220
French Fries	2.4 ounces	210	6.9 ounces	610	400
Muffin	1.5 ounces	210	4 ounces	500	290
Popcorn	5 cups	270	11 cups	630	360
Soda	6.5 ounces	85	20 ounces	250	165

Source: United States Department of Health and Human Services: National Institutes of Health.

In the last 20 years the average size of many of the most commonly consumed foods has increased dramatically.²⁸

Even though information is available about appropriate serving sizes, people generally do not correctly assess the amount they are eating. Often people are unable to tell the differences in portion size when offered different sizes on different days.^{29, 30}

Although it's important to be able to accurately determine the appropriate amount of food to eat, there is little research to suggest which methods are most successful. One study concluded that characteristics such as gender, age, body weight and level of education cause differences in the way people estimate portion size, and errors in estimating become greater as portions increase.³¹

Less Nutrition/Poor Choices

So what does it all mean?

- **Americans are eating more and more foods that are high in calories but don't meet their nutritional needs.**
- **Most Americans don't get enough of the nutrients they need through healthy foods, such as fat-free or low-fat dairy products, fish (preferably only), lean meats, poultry without skin, fiber-rich whole grains, a variety of fruits and vegetables, legumes, nuts and seeds.**
- **French fries are the most common vegetable consumed by children.**
- **Most children don't know how many fruits and vegetables they should be eating each day.**

Americans aren't just overeating. The foods they're choosing often do not meet their nutritional needs. They are not getting the proper amount of fruits, vegetables and dairy products, instead opting for "empty calorie" foods that are high in calories but low in nutrients (vitamins, minerals, protein, carbohydrates, etc.). These empty-calorie foods are often high in saturated and *trans* fat, sodium, cholesterol and added sugars.

Fruits and Vegetables

A higher intake of fruits and vegetables has been associated with lower risk of heart disease,³² but unfortunately most Americans do

not eat enough fruits and vegetables. According to a 2007 national study, three out of four American adults are not getting at least five servings of fruit and vegetables every day. (The daily recommendation is eight to nine servings, based on a 2000 calorie diet.)³³

Children are not getting enough fruits and vegetables either. Fewer than one in 10 high school students get the recommended amounts of fruits and vegetables daily;³⁴ and younger children on average consume just two cups of fruit, vegetables and juice every day.³⁵

French fries are the most common source of vegetable consumed by children and make up one-fourth of children's vegetable intake. Juice, which may lack important fiber found in whole fruits, accounts for 40 percent of children's daily fruit intake.³⁶

One reason children are not getting the recommended amounts of fruits and vegetables could be that they simply are not aware of how many servings they should be eating. In 2008, when middle school students were asked about the expert recommendation for daily fruit and vegetable consumption, less than one-fifth correctly answered five or more servings per day.³⁷

Additional studies have shown that children may be more willing to try vegetables if they grow them.³⁸ Children who participate in gardening programs may be more likely to eat vegetables,³⁹ and participation in gardening programs can increase students' preference for vegetables.⁴⁰ Students who initially said they did not prefer vegetables showed an improvement in preferring vegetables after the gardening program.⁴¹

Take Action!
Eat a variety of deeply colored fruits and vegetables daily, while limiting juice intake. Skip the fried veggies — frying adds fat and calories.

Fiber-Rich Whole Grains

The American Heart Association recommends that at least half of your grain intake come from whole-grain foods, which are high in fiber and other beneficial nutrients. Dietary fiber may help you feel fuller longer and reduces the total amount of calories you eat because fiber slows digestion in your stomach. Whole-grain foods may reduce your LDL or "bad" cholesterol levels and have been associated with a decreased risk of developing cardiovascular disease.⁴²

Despite the importance of whole grains in the diet, only 7 percent of survey respondents met the 2005 whole-grain recommendation. Specifically, 93 percent of Americans failed to meet the recommendation to consume 3 ounces per day of whole grains (based on a 2,000-calorie diet).⁴³ Among children and teenagers, average whole grain consumption ranged from 0.4 to 0.5 servings per day.⁴⁴

Americans eat too much refined grain and not enough whole grain. Children, even more than adults, favored refined over whole grains, and the presence of children in the home had a negative effect on adults' whole-grain consumption.

Take Action!

Make sure to fit whole grains into your daily menu by keeping foods such as whole-grain bread, cereal, brown rice or whole wheat pasta in your house. Restaurant meals tend to be very low in whole grains.⁴⁵ When you do eat out, ask if whole-grain alternatives are available.

Milk and Dairy

Americans are not getting enough milk and dairy products, which are nutrient-rich and an essential part of a healthy diet. Adequate amounts of dairy contribute to bone health and helps prevent osteoporosis. This may lower the risk of high blood pressure and other cardiovascular risk factors,⁴⁶ possibly due to the beneficial effects of nutrients found in milk, such as calcium.

In 2008 only 14 percent of students reported drinking three or more glasses of milk per day. Overall more males (19.4 percent) than females (8.8 percent) drank three or more glasses per day.⁴⁷ In 1977–78, children ages 6–11 drank about four times as much milk as soda. In 2001–02 they drank about the same amounts of milk and soda.⁴⁸

In addition to not consuming enough dairy products overall, children may not be selecting low-fat (1 percent) or fat-free dairy products, resulting in higher calorie, saturated fat and cholesterol consumption. In a 2008 survey that asked middle school students what kind of milk they usually drank, the most common answers were whole milk (40 percent), chocolate milk (34 percent), and 2 percent milk (25.8 percent).⁴⁹

Take Action!

Teach kids to pick nonfat (skim) or low-fat (1 percent) dairy products and keep them on hand in your fridge.

Fats

The American Heart Association recommends keeping total fat intake between 25 to 35 percent of total daily calories. You should also limit *trans* fat consumption to less than 1 percent of total daily calories (or about 2 grams based on a 2,000-calorie diet). Limit saturated fat consumption to less than 7 percent of total daily calories (or about 15 grams based on a 2,000-calorie diet).

In the past 30 years Americans have decreased the amount of fat consumed. From 1971 to 2000 the percentage of total calories consumed from fat decreased 4.1 percent for men and 3.3 percent for women. Calories from saturated fat decreased by 2.6 percent for

men and 2 percent for women.⁵⁰ However, despite this positive trend, many Americans are still consuming more than the recommended amounts of the “bad fats” (saturated and *trans* fats).

Although consumer awareness has increased about saturated and *trans* fats, overall knowledge of food sources of saturated and *trans* fats remains relatively low.⁵¹

Take Action!

The Nutrition Facts panel on food labels can help you make healthy food choices in the grocery store. Check the food label for *trans* fat content and the ingredient list for partially hydrogenated oils because they contain *trans* fat. Review both saturated fat and *trans* fat content on the Nutrition Facts panel to avoid substituting one unhealthy fat for another.

Many fried foods and baked goods are high in saturated fats and calories even if *trans* fat-free oils and fats are used. Use liquid vegetable oils such as olive, canola, soybean, corn, sunflower and safflower oils instead of animal fats and tropical (coconut and palm) oils. Choose foods that are steamed, broiled, baked, grilled or roasted. And ask restaurant servers about the oil used in food preparation and the nutrition information.

Added Sugars

In recent decades, Americans have increased their consumption of “added sugars,” which are found in carbonated soft drinks, fruit drinks, sports drinks and many processed foods such as desserts, sugars and jellies, candy and some ready-to-eat cereals. Added sugars are a common source of “empty calories” because they have little or no nutritional value but contribute additional calories to a food or beverage.

Sugar-sweetened beverages are a major contributor of added sugars. It is estimated that soft drink consumption alone accounts for one-third of added sugar intake in the U.S. diet.⁵²

In 2006, 34 percent of students reported drinking a can, bottle or glass of soda (not including diet soda) at least once a day. Overall, male students (38.6 percent) were more likely than female (29.0 percent) students to have consumed soda at least once a day.⁵³

In one study of fourth- and fifth-grade children, sweetened beverages constituted more than half (51 percent) of the average daily intake of beverages.⁵⁴ Another study found that about one-fourth (26.0 percent) of middle school students drank two or more sodas per day during the previous seven days.⁵⁵

Consumption of sweetened beverages has been linked to childhood obesity.⁵⁶ Reducing consumption of beverages with added sugars (and other foods high in added sugars) in children and adults is an important step in combating the obesity epidemic.

The American Heart Association recommends limiting the amount of added sugars to no more than half of your daily discretionary calories. For most American women, that's no more than 100 calories per day, or about 6 teaspoons of sugar. For men, it's 150 calories per day, or about 9 teaspoons. Based on a 2,000-calorie diet, the American Heart Association also recommends limiting sugar-sweetened beverages to 36 ounces per week or less.

Take Action!

Limit the amount of beverages with added sugars your family drinks. Look for no-calorie alternatives to soda, such as water.

Check food labels for added sugars in foods by scanning the ingredients list for sugar, syrups and sugar molecules ending in “ose,” to name a few.

Breakfast

Breakfast really may be the most important meal of the day for children and adults. Numerous studies have demonstrated that when they skip breakfast, the nutritional quality of their diets decreases.⁵⁷

People who eat breakfast are significantly less likely to be obese and diabetic than those who usually don't.⁵⁸ Additionally, children who eat breakfast are more likely to have better concentration, problem-solving skills and hand-eye coordination.⁵⁹

A 2009 study reported that more than half of U.S. consumers (56 percent) report not eating breakfast seven days a week. Those who skip are often children and teens.^{60, 61}

Sodium

Most Americans consume more than double the amount of their daily recommended level of sodium. The estimated average intake of sodium for people in the United States age 2 and older is 3,436 milligrams per day.⁶² Even more troubling, 97 percent of children and adolescents are eating too much salt, putting them at greater risk of cardiovascular disease as they age.⁶³ The American Heart Association recommends that adults consume no more than 1,500 milligrams of sodium a day (and less for children under 9) because of the harmful effects of sodium — elevated blood pressure and increased risk of stroke, heart attacks and kidney disease.

Recent studies have also indicated connections between sodium intake and sugar-sweetened beverage consumption. Salt is a major determinant of fluid and sugar-sweetened soft drink consumption during childhood. A reduction in sodium intake could, therefore, help reduce childhood obesity through its correlation with sugar-sweetened soft drink consumption. This would have a beneficial effect on preventing cardiovascular disease independent of and in addition to the effect of sodium reduction on blood pressure.^{64, 65}

Take Action!

More than 75 percent of sodium in the American diet comes from salt added to processed foods, beverages and restaurant foods.⁶⁶ Look for “low-sodium” or “sodium-free” items at the grocery store (and skip the salt shaker at the table too). In restaurants, order or request foods that have not been prepared with ingredients that are high in saturated fat, *trans* fat, cholesterol, added sugars and sodium (salt).

Diet in Early Childhood

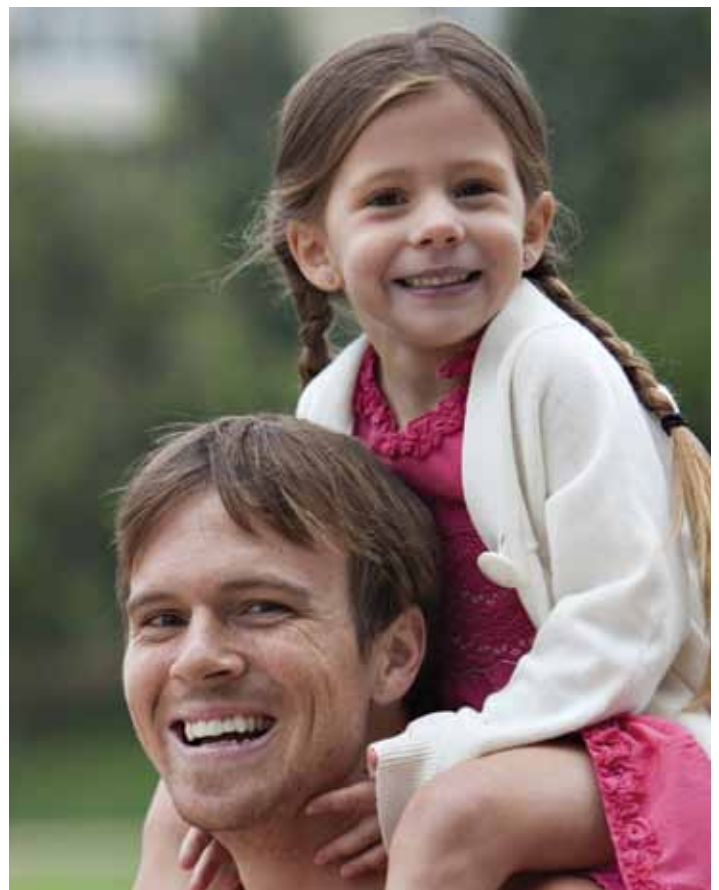
The American Heart Association recommends breast-feeding infants for the first 12 months. Studies show that children who were exclusively breastfed were less likely to be overweight at 6 months and 12 months than children who were exclusively formula

fed.⁶⁷ Babies who eat solid food before 4 months had a one in four chance of being obese at age 3, whereas babies who eat solid foods after 4–5 months only had a 1 in 20 chance of being obese.⁶⁸

Reap the Heart-Healthy Benefits of a Nutritious Diet

Recent research by the American Heart Association found that healthy dietary modifications can reduce the risk of heart disease, the No.1 killer of all Americans.

- Modest consumption of fish or fish oil (250 mg/d EPA_DHA, the equivalent of 1 to 2 servings per week of oily fish) was associated with a 36 percent lower risk of cardiac mortality.⁶⁹ Fish oil is high in “healthy” omega-3 fatty acids.
- People who replaced unhealthy saturated fats with healthier polyunsaturated fats reduced their risk of coronary heart disease by 24 percent.⁷⁰
- Those who followed low-salt (low sodium) diets had a 25 percent lower risk of cardiovascular disease after 10 to 15 years.⁷¹
- Greater whole-grain intake (2.5 compared with 0.2 servings per day) was associated with a 21 percent lower risk of cardiovascular disease events. In contrast, consumption of refined (processed) grains was not associated with lower risk of cardiovascular disease.⁷²
- Each additional daily serving of fruits or vegetables was associated with a 4 percent lower risk of coronary heart disease and a 5 percent lower risk of stroke.⁷³
- Diets in which 2 percent of calories came from *trans* fat were associated with a 23 percent higher risk of coronary heart disease.⁷⁴



American Heart Association Dietary Recommendations

The American Heart Association recommends that all Americans consume a wide variety of food from all food groups for optimal nutrition. Nutrient-rich foods have vitamins, minerals, fiber and other nutrients but are lower in calories. To get the nutrients you need:

- Choose a variety of fruits and vegetables, fish (preferably oily), lean meats and poultry without skin, fiber-rich whole-grain products, legumes, nuts, seeds, and fat-free or low-fat dairy products.
- Limit foods and beverages high in calories but low in nutrients.
- Limit consumption of saturated fat, *trans* fat, cholesterol, sodium and added sugars.

The following table outlines the American Heart Association's recommendations for a healthy, nutritious diet for children and adults:

For children⁷⁵

Age	1 year	2–3 years	4–8 years	9–13 years	14–18 years
Calories*					
Female	900	1,000	1,200	1,600	1,800
Male	900	1,000	1,400	1,800	2,200
Fat	30–40% kcal	30–35% kcal	25–35% kcal	25–35% kcal	25–35% kcal
Milk/dairy [†]	2 cups	2 cups	2 cups	3 cups	3 cups
Lean meat/beans [‡]					
Female	1.5 oz	2 oz	3 oz	5 oz	5 oz
Male	1.5 oz	2 oz	4 oz	5 oz	6 oz
Fruits [§]					
Female	1 cup	1 cup	1.5 cups	1.5 cups	1.5 cups
Male	1 cup	1 cup	1.5 cups	1.5 cups	2 cups
Vegetables [§]					
Female	3/4 cup	1 cup	1 cup	2 cups	2.5 cups
Male	3/4 cup	1 cup	1.5 cups	2.5 cups	3 cups
Grains					
Female	2 oz	3 oz	4 oz	5 oz	6 oz
Male	2 oz	3 oz	5 oz	6 oz	7 oz

*Calorie estimates are based on a sedentary lifestyle. Increased physical activity will require additional calories: by 0–200 kcal/d if moderately physically active; and by 200–400 kcal/d if very physically active.

[†]Milk listed is fat-free (except for children under the age of 2). If 1%, 2%, or whole-fat milk is substituted, this will use, for each cup, 19, 39 or 63 kcal of discretionary calories and add 2.6, 5.1 or 9.0 g of total fat, of which 1.3, 2.6 or 4.6 g are saturated fat.

[‡]Lean meat/beans include lean poultry without skin, fish, beans and peas (not green beans and green peas), nuts and seeds.

[§]Serving sizes are 1/4 cup for 1 year of age, 1/3 cup for 2 to 3 years of age, and 1/2 cup for ≥4 years of age. A variety of fruits and vegetables should be selected daily, while limiting juice intake.

^{||}Half of all grains should be whole grains.

For 1-year-old children, calculations are based on 2% fat milk. If 2 cups of whole milk are substituted, 48 kcal of discretionary calories will be used. The American Academy of Pediatrics recommends that low-fat/reduced fat milk not be started before 2 years of age.

For Adults (ages 18 and older) Based on 2000-Calorie Goal⁷⁶

Grains*	6 to 8 servings per day
Vegetables	4 to 5 servings per day
Fruits	4 to 5 servings per day
Fat-free or low-fat milk and dairy products	2 to 3 servings per day
Lean meats, poultry (skinless) and fish [†]	less than 6 oz per day
Nuts, seeds and legumes	4 to 5 servings per week
Fats and oils	2 to 3 servings per day
Sweets and added sugars	Limit sugar-sweetened beverages to less than 450 calories (36 oz) per week. Limit added sugars: women not more than 100 calories per day and men no more than 150 calories per day from added sugars in food or beverages.

*At least half of the grains should be fiber-rich whole grains.

[†]Fish: Include at least two 3.5 oz. servings per week (preferably oily fish)

Eating Out

So what's the big deal?

- People eat out more than ever before.
- When people eat out, they often consume more calories, saturated fat, *trans* fat, cholesterol, sodium and added sugars than if they eat at home.
- Away-from-home meals usually contain fewer fruits, vegetables and whole grains than foods prepared at home.

When it comes to eating out, about the only thing that is getting thinner is our wallets. In 1970, 26.3 percent of total food expenditures went to out-of-home foods. By 2002, that had risen to 46 percent.^{92, 93, 94, 95}

The traditional home-cooked meal is becoming a rarity as eating away from home has become more common than ever before. Today there are more two-income families, and Americans are traveling more, commuting longer distances and working longer hours. This leaves less time to prepare food at home. Restaurants and fast-food outlets are filling the gap.⁷⁷

The more people eat out, particularly at fast-food restaurants, the more calories, fat and sodium they tend to consume.⁷⁸ Food obtained from fast-food outlets, restaurants and other commercial sources is associated with increased caloric intake and lower diet quality, especially among children ages 13–18.⁷⁹ This is linked to higher BMIs both in children and adults.

*Today Americans have greater access to away-from-home foods than in the past. The number of food-service establishments in the United States almost doubled from 491,000 in 1972 to 878,000 in 2004.*⁹⁶

Eating more fast-food meals is linked to consuming more calories, more saturated fat, fewer fruits and vegetables, and less milk.^{80, 81, 82, 83, 84} This is especially alarming if you consider how popular fast-food has become with kids. In the late 1970s American children ate 17 percent of their meals outside the home and fast food accounted for 2 percent of total energy intake.⁸⁵ By the mid-to-late 1990s, 30 percent of meals were eaten outside the home and fast food contributed to 10 percent of overall energy intake. In 2000, 41 percent of U.S. adults consumed three or more commercially prepared meals per week.⁸⁶

The number of fast-food restaurants has more than doubled from 1972 to 1995 and now totals an estimated 247,115 nationwide.⁹⁷

Away-from-home foods contain fewer fruits, vegetables and whole grains, and tend to be more energy-dense and contain more fats and sugars than foods prepared at home.⁸⁷ USDA researchers have calculated that in 1995 if food eaten away from home had the same average nutritional densities as food eaten at home, Americans would have consumed 197 fewer calories per day and reduced their fat intake to 31.5 percent of calories (instead of the actual 33.6 percent).⁸⁸

Women who eat out more often (more than five times per week) consume about 290 more calories on average each day than women who eat out less often.⁸⁹

The larger portions often available at fast-food outlets may play a direct role in increased calorie intake. Customers who purchase larger portions of an entrée increase their intake of the entire meal by 25 percent.⁹⁰

Visit heart.org/nutrition for more nutrition tips for your family.

By making more-informed dietary choices away from home and learning to cook healthy meals from home, Americans could help reduce calorie consumption and the risk of obesity and its associated health problems.⁹¹

Lack of Physical Activity

So what's the big deal?

- **Adults and children are not getting enough physical activity.**
- **Fitness and physical activity habits established in childhood are key health indicators in adulthood.**

Physical activity brings lots of positive health benefits, including improved physical fitness, muscle endurance, aerobic (lung) capacity and mental health (including mood and cognitive function). It also helps prevent sudden heart attack, cardiovascular disease, stroke, some forms of cancer, type 2 diabetes and osteoporosis. Additionally, regular physical activity can reduce other risk factors like high blood pressure and cholesterol.

Despite its many benefits, children and adults are not getting as much physical activity as they should. The American Heart

Association recommends that children and adolescents up to age 17 get at least 60 minutes of moderate to vigorous physical activity every day. Adults ages 18–65 should get at least 150 minutes per week of moderate-intensity physical activity, which may be done with 30 minutes of moderate-intensity activity on five days of the week. There are additional guidelines for people age 65 and older, pregnant women and those ages 50–64 with chronic conditions or physical functional limitations (e.g., arthritis) that affect movement ability or physical fitness.⁹⁸

About one-third of students in grades 9–12 don't get the recommended levels of physical activity.⁹⁹ Furthermore, research suggests that extracurricular physical activity levels consistently decrease from elementary to high school, especially in girls. Research also indicates that most adolescents do not participate in moderate physical activity five or more times per week, and these patterns persist into adulthood.^{100, 101}

Inactivity among children and adolescents has led to a common question among researchers: Do kids even know how much physical activity they should be getting? In a recent study only 27 percent of youth respondents could identify the recommendation of 60 minutes or more per day, although more could name individual benefits of physical activity, including preventing weight problems (56.6 percent), preventing heart problems (39.1 percent) and improving mood (34.8 percent); 29 percent could not name any benefits.¹⁰²

As children age, their physical activity levels tend to decline.^{103, 104} That's why it's important to establish good physical activity habits as early as possible. A recent study suggests that teens who participate in organized sports during early adolescence maintain higher levels of physical activity during late adolescence compared to their peers, although their activity levels do decline.¹⁰⁵ And kids who are physically fit are much less likely to be obese or have high blood pressure in their 20s and early 30s.¹⁰⁶

Recent estimates suggest that more than 50 percent of U.S. adults do not get enough physical activity to provide health benefits, and 33 percent are not active at all in their leisure time. Physical activity is less common among women than men and among those with lower incomes and less education.^{107, 108}

Take Action!

Get moving! Encourage activities that the entire family can do together. If you're currently not active at all, start slowly and build up.

Overweight kids may be discouraged about getting physically active if they feel their skill level is not up to par with their peers, so encourage activities that they can excel at like brisk walking and strength or resistance training.

Technology's Sedentary Seduction

So what's the big deal?

- **Sedentary screen time contributes to cardiovascular risk.**
- **Most children get more than the recommended limit of two hours of screen time per day.**
- **Limiting daily screen time to two hours or less has positive health effects.**

Americans are spending more free time than ever watching television, surfing online or playing video games. A recent study found that this sedentary activity is related to raised mortality and cardiovascular disease risk regardless of physical activity participation.¹⁰⁹

In addition to being sedentary, people tend to eat while watching TV. Each one-hour increase in television viewing is associated with an additional 167 calories, often through foods commonly advertised on television.¹¹⁰

As children devote more and more of their free time to television, computers and video games, they're spending less time playing sports and games and being physically active. For example:

- A survey of young people (ages 8–18) showed their daily activities accounted for the following time amounts:¹¹¹

Watching television — 3 hours, 51 minutes

Using the computer — 1 hour, 2 minutes

Video games — 49 minutes

Reading — 43 minutes

- The typical American child spends about 44.5 hours per week using media outside of school.

Too much tube time is linked to cardiovascular risk factors in children. Kids (average age 12) who watch two to four hours of TV every day have 2½ times the risk of high blood pressure as those who watch less.¹¹²

Sticking with the recommended two-hour daily TV limit can have a positive effect on children's health. One study of overweight children ages 4 to 7 found that this limit helped reduce caloric intake, sedentary behavior and body mass index over a two-year period.¹¹³

Parents may not always be able to regulate the number of hours that their children watch TV; however, they usually can control whether there is a TV in the children's bedrooms. The American Academy of Pediatrics suggests that not placing a TV in adolescents' bedrooms may be a first step in decreasing screen time and subsequent poor behaviors associated with increased TV watching.¹¹⁴ The American Heart Association and American Academy of Pediatrics also recommends that children limit screen time to no more than two hours per day.

Take Action!

Limit screen time to two hours a day — for children and adults! Adults set the example for kids.

Don't snack while watching TV. It's easy to get caught up in the show and not realize how much you're eating.

Take the TV and computer out of kids' bedrooms. Children and teens who have a TV or computer in their bedroom watch about an hour and a half more TV per day than those who don't, and they use the computer about 45 minutes more per day.¹¹⁵

Parents' Perceptions and Roles

So what's the big deal?

- **Parents are important role models for their children. If parents are unhealthy, children are likely to be unhealthy too.**
- **Parents may not recognize when children have a weight problem.**

Parents are role models whose health attitudes and behaviors play a critical role in the development of their children. An increasing body of research confirms that children's eating and physical activity habits closely resemble those of their parents. However, while parents can help overweight children manage their weight, they aren't always aware when their children are at risk.

In recent studies, parents have shown a high tendency to misperceive their children's weight and failed to identify them as overweight. This has been especially likely if parents themselves are overweight. If parents do not recognize their child as obese or overweight, they are less likely to support them in achieving a healthy weight.¹¹⁶

Prioritizing positive meal habits can also play a critical role for children. Eating dinner at home together as a family has been shown to increase fruit, vegetable and whole-grain consumption as well as decrease fat and soft drink consumption in children and teens.¹¹⁷

Parents' levels of physical activity also predict the habits of their children. When parents are sedentary or inactive, their children are more likely to be sedentary as well. Children of two active parents may be nearly six times more likely to be physically active than children with sedentary parents.¹¹⁸

Some parents of overweight children worry about labeling them or hurting their self-esteem. But parents play a critical role in the lifestyle habits of their children both through the habits they model and through the support and awareness they offer.

Take Action!

Calculate the BMI for each family member to find out if they're at risk for heart disease.

Sleep

So what's the big deal?

- **Children need at least nine hours of sleep per night.**
- **Sleep plays an important role in the body's ability to grow, repair and stay well.**

Recent research points to a connection between poor sleep habits and health problems, including obesity. Adequate sleep time is especially important for adolescents.¹¹⁹ Despite recommendations that children and teens get at least nine hours of sleep every night, only 31 percent of high school students get eight or more hours of sleep on an average school night.¹²⁰ Although more research is needed to determine the exact connection between sleep and obesity, adequate sleep is beneficial to overall mental and physical health.

The Situation in Schools

In recent decades the school environment has changed drastically. A generation ago schools fostered physical activity, but today many have been forced to de-emphasize it to balance shrinking budgets and focus on academic requirements. Every school day, 54 million young people attend nearly 123,000 private and public schools across the nation, leaving school health programs as one of the most efficient options to encourage healthy lifestyles.

Physical Activity in Schools

A recent report revealed that physical education time has declined across many school districts since 2002.¹²¹ In some areas, school-based physical activity programs have been completely eliminated.¹²²

Only 3.8 percent of elementary schools, 7.9 percent of middle schools and 2.1 percent of high schools provide daily physical education or its equivalent for the entire school year. Twenty-two percent of schools do not require students to take any physical education at all.¹²³ And only 33 percent of high school students attended daily PE classes.¹²⁴

Although nearly three-fourths of middle school students participate in sufficient levels of vigorous physical activity, less than half report attending daily physical education classes.¹²⁵ As of 2007, up to 46 percent of high school students did not attend physical education classes at all and 70 percent did not attend physical education classes daily, up from 58 percent in 1991.¹²⁶ Forty-four percent of high school students are not enrolled in any physical education, and participation declines with each grade level.

Although most school districts have some physical education requirement for high schools, only 13.3 percent of freshmen and 5.4 percent of seniors are required to take physical education.¹²⁷ There is strong public support for more physical education in schools: 81 percent of adults believe daily physical education should be mandatory.¹²⁸

The American Heart Association recommends that children and teens get at least 60 minutes of moderate-to-vigorous physical activity every day. Unfortunately, the American Heart Association's recommendation that 30 of those minutes take place during the school day is not met on many campuses.

Nutrition in Schools

Schools offer a wide variety of meal and snack options, but not always healthy ones. In a 2007 study, 61 percent of foods sold outside of high school meals programs (including vending-machine products, a la carte items, school store/canteen items) were fried and high in fat. These calorie-dense, nutrition-poor foods accounted for 83 percent of all food sold.¹²⁹ Currently only 21 percent of U.S. middle and high schools offer fruits and non-fried vegetables in vending machines, school stores or snack bars.¹³⁰

Schools can be part of the solution. Comprehensive nutrition education has proven to be effective in combating obesity, especially among low-income students.¹³¹ Additionally, improving nutrition standards of foods sold in schools can have a positive impact on students' diets.

Early Childhood Programs

Child care settings are also important environments for forming good health habits. Poor diet and physical inactivity at an early age increase the chances for developing serious health problems. Preschool children are consuming too many high-calorie, sweetened beverages and foods that are low in nutrients.^{132, 133} A recent study of children in the Women, Infants and Children Feeding Program found that on average, children spent more than twice as much time watching television and using computers than being physically active.¹³⁴

Quality Programs Have Proven Return on Investment

Despite economic pressure and a focus on test scores, it is productive for schools to foster healthy lifestyle skills for students and staff. In fact, schools that do so often see improved test scores, fewer behavioral problems, increased financial benefits, and happier and healthier students and staff. Studies have shown that normal-weight children have higher scholastic achievement, less absenteeism and higher physical fitness levels than their obese counterparts.^{135, 136}

Healthcare Settings

So what's the big deal?

- **Healthcare providers are not consistently diagnosing weight problems in children.**
- **Healthcare providers may not feel equipped to talk about nutrition and physical activity with patients.**

Although dealing with obesity at the earliest possible stage is critical for a child's long-term health, far too few doctors are adequately addressing the problem in their young patients.

One recent estimate suggests that pediatricians accurately identified and diagnosed only 34 percent of overweight or obese children. Specifically, pediatricians correctly diagnosed 10 percent of overweight children, 54 percent of obese children and 76 percent of severely obese children.¹³⁷

Data shows that among all overweight children and teens ages 2 to 19 (or their parents), 36.7 percent reported ever having been told by a doctor or healthcare professional that they were overweight. For those ages 2 to 5, this percentage was 17.4 percent; for ages 6 to 11, 32.6 percent; for ages 12 to 15, 39.6 percent; and for ages 16 to 19, 51.6 percent.¹³⁸

Similar trends were seen for males and females. Among racial/ethnic populations, overweight non-Hispanic black females were significantly more likely to be told that they were overweight than were non-Hispanic white females (47.4 percent vs. 31 percent). Among those told that they were overweight, 39 percent of non-Hispanic black females were severely overweight (BMI above the 99th percentile for age and sex), compared with 17 percent of non-Hispanic white females.¹³⁹

Take Action!

Make it a point to talk to your healthcare provider about your weight (or your child's) at your next visit.

Marketing Unhealthy Foods to Kids

So what's the big deal?

- **Advertising affects consumer behavior in adults and children.**
- **A dramatic majority of ads targeted at children are for unhealthy products.**
- **Almost no advertising dollars are spent marketing healthy products to children.**

Advertising on television and other electronic media has major influence on our lifestyle decisions, particularly in young people. It affects food preferences, purchase requests and diets of many children and is associated with the increased rates of obesity in this age group.¹⁴⁰

Young people see more than 40,000 advertisements per year on television alone, and half of all ad time on children's television shows is for food.¹⁴¹ Specifically:

- Children ages 2–7 see an average of 12 food ads a day on TV. Over the course of a year, this is an average of more than 4,400 food ads — nearly 30 hours.
- Children ages 8–12 see an average of 21 food ads a day on TV. Over the course of a year, this is an average of more than 7,600 food ads — more than 50 hours.
- Teenagers ages 13–17 see an average of 17 food ads a day on TV. Over the course of a year, this is an average of more than 6,000 food ads — more than 40 hours.¹⁴²

Among all ads (in addition to television) children see, food is the largest product category for all ages (32 percent for 2–7-year-olds, 25 percent for 8–12-year-olds, and 22 percent for 13–17-year-olds), followed by media and travel/entertainment.¹⁴³

The most common food products in ads targeting children and teens are candy and snacks (34 percent), cereal (28 percent) and fast food (10 percent).¹⁴⁴

Another study assessing typical Saturday-morning children's programming showed that among food ads, 43 percent fell in the fats, oils and sweets group, while 11 percent were for fast-food restaurants. There were no advertisements for fruits and vegetables.¹⁴⁵

The food industry spends \$15 billion per year on marketing and advertising to children under age 12, twice the amount spent in the previous decade.¹⁴⁶ Since 1994, U.S. companies have introduced more than 600 new children's food products.¹⁴⁷

The food industry recognizes that children and adolescents have significant discretionary income and are a powerful consumer segment, spending more than \$180 billion per year and influencing their parents' spending for another \$200 billion per year.^{148, 149} Unfortunately, children tend to spend their discretionary income on high-calorie, low nutrient-dense foods, and advertising certainly leads them in this direction.¹⁵⁰

In addition, packaging of less-healthy foods is often misleading to parents and children. For example, in one study, nearly two-thirds of highly advertised children's food products with images of or references to fruit on the package contained little or no fruit and were high in added sweeteners.¹⁵¹ In fact, about six in 10 products that companies thought appropriate to market to children did not meet recommended nutrition standards for food marketing to children. Products were often too high in added sugars, saturated fat or sodium, and few contained significant amounts of fruits, vegetables or whole-grains.¹⁵²

Despite their efforts, the top quick service restaurant advertisers have yet to shift their advertising to focus only on healthy offerings. Of the 16 companies taking part in the self-regulatory program, four collectively account for 58.3 percent of children's food advertising observed overall and for 81.9 percent of all advertising from pledge companies. Those companies complied with their pledges but not necessarily with the Institute of Medicine's goal of advertising only healthy foods to children.¹⁵³

Research shows that exposure to food advertisements produces substantial and significant increases in calorie intake in all children and the increase is largest in obese children.¹⁵⁴ Aggressive advertising of high-calorie, low nutrient-dense foods (foods that are readily available in corner markets and low-income neighborhoods) contribute to higher consumption of those foods and thus is an important causative factor in the obesity epidemic.¹⁵⁵

Along with many other factors, food and beverage marketing influences the diet of children and youth. Current food and beverage marketing practices for children do not promote healthy dietary habits.

Take Action!

Turning off the TV is a great way to limit the number of advertisements your family sees.

Market healthy foods to your family. Companies spend almost no ad dollars on fruits and vegetables, so make a pitch for the healthier foods yourself!

Consequences of Obesity

The obesity epidemic has an impact on every American. Even if you are not personally obese or overweight, odds are that you have a friend or a loved one who is. Additionally, obesity puts a financial burden on society. Estimates project that about one of every nine healthcare dollars can be attributed to overweight and obesity. This number is projected to increase with skyrocketing trends of obesity in children and adults.¹⁵⁶

Overall Health Consequences

So what's the big deal?

- **Obesity impacts every organ system in the body.**
- **Obesity is now regarded as more damaging to the body than smoking or excessive drinking.**
- **Obese and overweight children are at increased risk of developing heart disease.**

Obesity and overweight have a negative impact on almost every organ system in the body. In addition to taking a toll on the physical health of children, obesity influences children's quality of life, impacting their physical, social and psychological functioning.¹⁵⁷

In fact, obesity is associated with more chronic medical conditions than smoking or excessive drinking.¹⁵⁸

There is a direct correlation between increases in body mass index and increased risk for numerous other diseases and chronic conditions including diabetes, high blood pressure, asthma, liver problems, sleep apnea and some cancers. Additionally, people who are obese or overweight are estimated to have a lower life expectancy. Studies suggest that obesity shortens the average lifespan by at least four to nine months. Among adults, obesity was associated with nearly 112,000 excess deaths relative to normal weight in 2000.¹⁵⁹

Overweight children and adolescents:¹⁶⁰

- Are more likely than other children and adolescents to have risk factors associated with cardiovascular disease (e.g., high blood pressure, high cholesterol and type 2 diabetes).
- Are more likely to be obese as adults.
- Are more likely to experience other health conditions associated with increased weight including asthma, liver problems and sleep apnea.
- Have higher long-term risk of chronic conditions such as stroke; breast, colon, and kidney cancers; musculoskeletal disorders; and gall bladder disease.

Cardiovascular Health Consequences

Being overweight or obese by itself is a major preventable risk factor for heart disease, which can lead to heart attack. Obesity has recently overtaken smoking as the leading cause of premature heart attack.¹⁶¹

A recent study found that overweight children ages 7 to 13 are at an increased risk of developing heart disease beginning at age 25.¹⁶² Teens who are obese and who have high triglyceride levels have arteries similar to those of 45-year-olds.¹⁶³

One study showed that about 60 percent of overweight children ages 5 to 10 already had at least one risk factor for heart disease such as high cholesterol, high triglycerides, high insulin or high blood pressure; 25 percent already had two or more heart disease risk factors¹⁶⁴; and a child's blood pressure levels are highly predictive of blood pressure later in life.^{165,166} These alarming trends mean heart disease prevention must begin in childhood.¹⁶⁷

Type 2 diabetes, once referred to as "adult onset" diabetes, is largely preventable with proper diet and physical activity. Until recently, most newly diagnosed cases of diabetes in children were for type 1, which is mainly genetic. But today, as many as 45 percent of newly diagnosed diabetes cases in children are type 2. At least 65 percent of people with diabetes die of some form of heart disease or stroke when the disease is left untreated.¹⁶⁸

Higher risk factor levels mean many children are being put on medications they will have to take for the rest of their lives as early as age 12.¹⁶⁹

Metabolic Syndrome in Children

One phenomenon related to the obesity epidemic is metabolic syndrome in children. This is diagnosed when someone has at least three risk factors for cardiovascular disease related to the metabolic system. The metabolic system is responsible for the chemical reactions in our bodies that control everything from



supplying oxygen to the blood to digesting food for energy. Metabolic risk factors include obesity, high cholesterol, high blood pressure, high triglycerides and high fasting glucose. Metabolic syndrome is linked to improper diet and low levels of physical activity.¹⁷⁰

Overweight adolescents (ages 12 to 19) have 16 times the risk of metabolic syndrome as normal-weight adolescents. This means they are at significantly higher risk for developing heart disease.¹⁷¹

Early intervention aimed at managing obesity could reduce the risk of developing metabolic syndrome, and subsequently heart disease. It is conceivable that even in the absence of weight loss, overweight and obese children could lower their risks through lifestyle changes. There is no specific treatment for this clustering of risk factors in children other than reducing obesity, increasing physical activity, proper diet and treating the various components of metabolic syndrome.¹⁷²

Asthma

Asthma is a disease of the lungs in which the airways become blocked or narrowed, causing breathing difficulty. Studies have identified an association between being overweight as a child and asthma.^{173, 174, 175} Extra weight can make it harder to breathe and can inflame the respiratory tract. Children with serious asthma are more likely to be overweight.¹⁷⁶ Use of asthma medicines rose by 46.5 percent between 2002 and 2005.¹⁷⁷

Sleep Apnea

Obesity is a major correlative factor for sleep apnea, a condition that causes a sleeping person to stop breathing properly and lose airflow for at least 10 seconds. Weight reduction has been associated with comparable reduction in the severity of sleep apnea. Medical and surgical studies have demonstrated that as little as a 10 percent weight reduction is associated with a more than 50 percent reduction in the severity of sleep apnea.¹⁷⁸

Allergies

Obese children and adolescents are at increased risk of having some kind of allergy, especially to a food. Obese children were about 26 percent more likely to have allergies than children of normal weight. The rate of having a food allergy was 59 percent higher for obese children. The study shows a positive association between obesity and allergies, but does not prove that obesity causes allergies.¹⁷⁹

Social

Being overweight or obese can be particularly devastating for children and teens, who are often the targets of early social discrimination and subject to negative stereotyping by peers. They experience more teasing and are more likely to be bullied. Thus, being overweight can have a negative impact on a child's self-esteem, behavior, friendships and academic performance.^{180, 181, 182, 183, 184}

Findings suggest that overweight girls are less likely to exhibit self-control and more likely to act out behaviors and show undesirable internal behaviors compared to non-overweight girls. These results support previous research identifying lower psychological well-being among overweight children resulting in elevated levels of loneliness, sadness and nervousness.¹⁸⁵

The negative psychological and social effects often carry over into adulthood. Some studies indicate that overweight adults are less likely to be employed, receive less financial support for college among women and have lower household incomes for both men and women.¹⁸⁶

Learning

Mounting research shows a remarkable correlation between proper nutrition/adequate physical activity and improved academic outcomes/behavioral performance in school. Additionally, some studies have shown that being overweight may be linked to lower academic performance. Healthier children have higher scholastic achievement, less absenteeism and higher physical fitness levels than their obese counterparts.^{187, 188}

How Nutrition Affects Learning

Although scientists cannot attribute behavioral problems such as attention deficit disorder to any specific dietary nutrient (such as sugar), studies do show a correlation between good nutrition and improved behavior.

Poor nutrition can adversely affect brain function and have an impact on cognition and behavior. Correction of nutrient deficiencies can lead to measurable improvement. Proper nutrition has a positive effect on memory, reasoning and attention. Additional benefits include improved decision time in a reaction-time task, faster information processing, better word recall and improvement on a cognitive conflict test.¹⁸⁹

Teachers in schools that have improved the nutrient quality of food report that those students are more focused in class and behavior has significantly improved. Some schools have noted a substantial decrease in suspensions after changing school food and beverages.¹⁹⁰ Studies also reveal a link between nutritional intake and improved attendance and class participation.¹⁹¹

How Physical Activity Affects Learning

Kids who are physically active and fit are likely to have stronger academic performance. Activity breaks can improve cognitive performance and classroom behavior.¹⁹² Studies have shown that students who performed regular or vigorous physical activity achieved higher academic scores.^{193, 194}

Adolescents who reported participating in school activities, such as physical education and team sports, or playing sports with their parents, were 20 percent more likely than their sedentary peers to earn an "A" in math or English.¹⁹⁵

Students exhibited significantly more on-task classroom behavior and significantly less fidgeting on days with a scheduled activity break than on non-activity days.¹⁹⁶

There may be a link between physical activity and improved academic achievement among young children. After a period of physical activity, children scored higher on tests measuring how well they paid attention, suggesting that physical activity increases a child's ability to focus, even in the presence of distractions.¹⁹⁷

Additionally, research indicates that there is a significant association between being overweight and academic achievement. Overweight third grade children scored lower than their non-overweight peers on standardized tests.¹⁹⁸

Financial Impact

So what does it all mean?

- **The more overweight a person becomes, the more expensive he or she becomes to the healthcare system.**
- **Obesity is more expensive to the healthcare system than smoking and problem drinking.**
- **9.1 percent of adult medical expenditures can be attributed to obesity.**

While obesity is a major health problem, it is also a major financial problem for our healthcare system. That's why tackling obesity is the right thing to do, for our health and the bottom line.

Obesity costs tripled in the past decade: Beyond the toll in human suffering and death, obesity and its associated diseases have a steep price tag. Obesity is a significant factor driving health care spending, accounting for an estimated 12 percent of growth in recent years.¹⁹⁹ The cost of treating obesity-related illnesses in the U.S. tripled in just over a decade, from \$78 billion in 1998 to \$270 billion in 2009.^{200, 201}

In the U.S. and Canada, the total cost of excess medical care caused by overweight and obesity is \$127 billion; economic loss of productivity caused by excess mortality is \$49 billion; economic loss of productivity caused by disability for active workers is \$43 billion; and economic loss of productivity caused by overweight or obesity for totally disabled workers is \$72 billion.²⁰²

Children

- Obesity-related annual hospital costs for children more than tripled between 1979 and 1999.²⁰³
- Children treated for obesity are roughly three times more expensive for the healthcare system than children of normal weight. In 2006, total healthcare spending for children diagnosed with childhood obesity was estimated at \$750 million annually.²⁰⁴
- Annual health expenditures for an overweight child are \$72 higher than for a healthy-weight child. These costs are expected to increase as a child ages and develops increased health problems.²⁰⁵
- The number of children who take medication for chronic diseases has jumped dramatically since 2002, another contributing factor to rising healthcare costs.²⁰⁶

Adults

- Severely overweight adults spend more on health care than smokers, and obesity-related costs exceed costs attributable to smoking and problem drinking.²⁰⁷
- 9.1 percent of annual medical spending for adults can be attributed to the overweight and obese.²⁰⁸
- Costs for severely obese adults are 75 percent more than for their peers of normal weight. Consider these mean annual healthcare costs for adults:²⁰⁹
 - Normal weight: \$3,254
 - Overweight: \$3,202
 - Moderately obese: \$3,924
 - Severely obese: \$5,695
- A typical obese adult will generate more medical costs each year than a person 20 years older of normal weight.²¹⁰

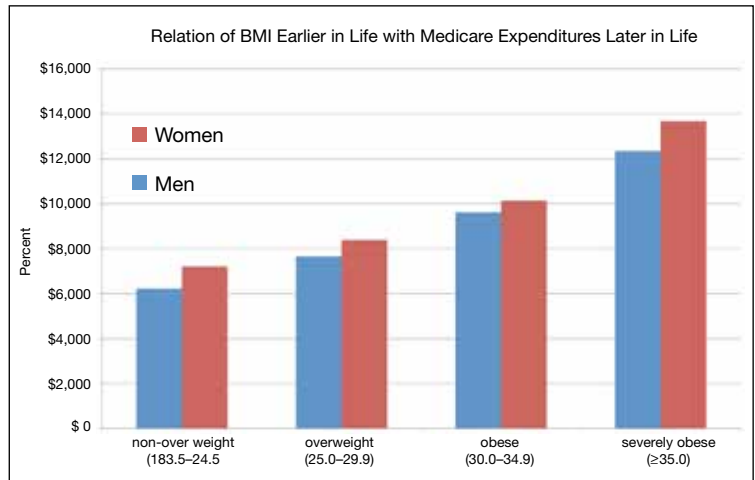
- Obese people pay 36 percent more for health care and 77 percent more for medication when compared with normal-weight people.²¹¹
- On average, a male employee with a BMI exceeding 30 costs \$670 more annually than a male of normal weight. Obese females cost \$1,200 more annually than normal-weight females.²¹²

Here are the costs of several obesity-related procedures or office visits:

- Average charge for a coronary bypass: \$83,919²¹³
- Average charge for laparoscopic bariatric surgery: \$17,660²¹⁴
- Average charge for three sessions with a registered dietitian: \$180²¹⁵

Medicare and Medicaid

In one study, annual expenditures were 15 percent higher for obese Medicare patients than for normal or overweight patients.²¹⁶ People who are severely obese earlier in life have over twice the amount of total average annual Medicare expenditures later in life, compared to people who are normal weight.²¹⁷ The number of obese Medicare recipients nearly doubled between 1987 and 2002, and the cost of treating them almost tripled.²¹⁸



Obese Workforce

- Excessive weight and physical inactivity negatively impact:²¹⁹
 - the quality of work performed
 - the quantity of work performed and
 - overall job performance among obese, sedentary people.
- On average, obese workers have up to 21 percent higher healthcare costs than normal-weight employees.²²⁰
- Excessive weight gain among employees is related to increased workers' compensation claims.²²¹

A Costly Future

It is projected that healthcare costs attributable to obesity and overweight will more than double in each of the coming decades. By 2030, according to one study, obesity-related care could account for up to 17.6 percent of total healthcare costs.²²² Additionally, indirect costs associated with obesity include lower productivity, increased absenteeism and higher life insurance and disability insurance premiums.²²³

Out of Balance: Disparities and Racial, Ethnic and Low-Income Groups

So what does it all mean?

- **Certain racial and ethnic groups are more at risk to be obese or overweight.**
- **The prevalence of obesity is rising fastest among African-American and Hispanic populations, making these groups especially at risk.**
- **Low-income families have a greater prevalence of overweight in some populations.**
- **The highest regional prevalence of obesity is consistently in the South.**

This is not an isolated threat to health, nor one limited to a particular population group. Throughout the United States, overweight and obesity have increased in people of all ethnic groups, ages and genders.

However, among some racial, ethnic and socioeconomic groups, and within certain geographic regions, the prevalence of obesity and many obesity-related risk factors is especially high.

While personal choices play a role in the rise of obesity, they alone are not responsible. Many children grow up surrounded by unhealthy foods at home and in school. Others lack access to safe places where they can play and be active. Some low-income neighborhoods have many fast-food restaurants, but few stores or markets that sell nutritious foods. And many Americans of limited economic resources simply can't afford to buy healthy foods, join health clubs or participate in organized sports or physical activity programs.

The obesity epidemic threatens everyone, but not everyone is equally at risk. For example, among children and adolescents, obesity is more common in African-Americans and Latinos and the numbers of overweight African-American and Latino children are growing faster than the number of overweight non-Hispanic white children.^{224, 225}

Racial and Ethnic Disparities

In 2005–06, among Americans age 20 and older, the following are overweight or obese (BMI of 25.0 and higher):²²⁶

- For non-Hispanic whites, 72.4 percent of men and 57.5 percent of women.
- For African-Americans, 73.7 percent of men and 77.7 percent of women.
- For Latinos, 74.8 percent of men and 73.0 percent of women.

Of these, the following are obese (BMI of 30.0 and higher):

- For non-Hispanic whites, 32.3 percent of men and 32.7 percent of women.
- For African-Americans, 36.8 percent of men and 52.9 percent of women.
- For Latinos, 26.8 percent of men and 41.9 percent of women.

Among children ages 2–19, the following are overweight and obese:²²⁷

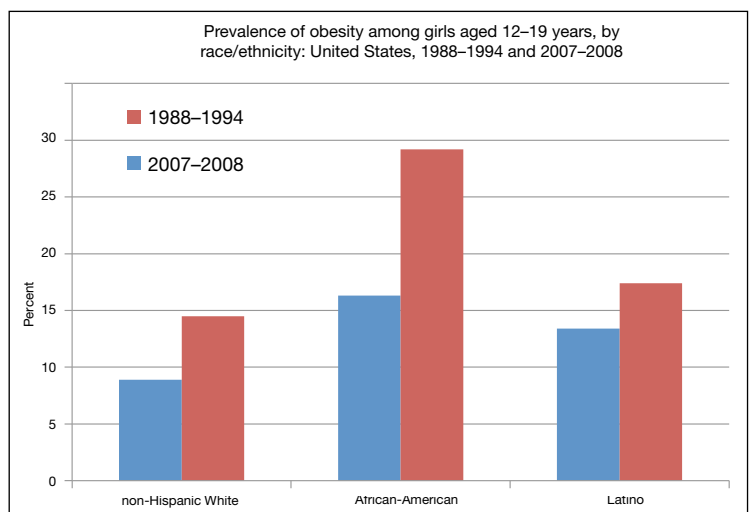
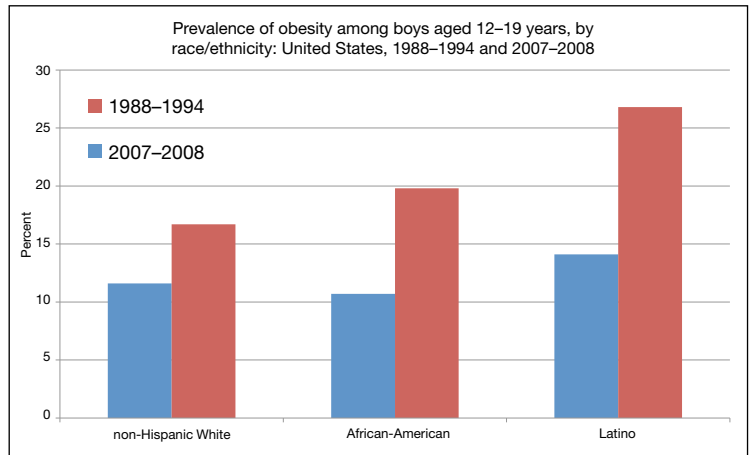
- For non-Hispanic whites, 29.5 percent of males and 29.2 percent of females
- For African-Americans, 33 percent of males and 39 percent of females
- For Latinos, 41.7 percent of males and 36.1 percent of females

Between 1988–1994 and 2007–2008 the prevalence of obesity increased:²²⁸

- From 11.6 percent to 16.7 percent among non-Hispanic white boys.
- From 10.7 percent to 19.8 percent among African-American boys.
- From 14.1 percent to 26.8 percent among Latino boys.

Between 1988–1994 and 2007–2008 the prevalence of obesity increased:²²⁹

- From 8.9 percent to 14.5 percent among non-Hispanic white girls.
- From 16.3 percent to 29.2 percent among African-American girls.
- From 13.4 percent to 17.4 percent among Latino girls.



The widening gap: The numbers of obese African-American and Latino children are growing faster than the number of obese non-Hispanic white children.²³⁰ Fifteen percent of African-American and Latino high school students are obese, versus 10 percent of non-Hispanic white children.²³¹

Less physical activity: African-American and Latino children are less likely to play sports or participate in the recommended 60 minutes of physical activity per day, either in school or after school.^{232, 233} More than twice as many African-American high school students watched television three or more hours per day than their non-Hispanic white classmates.²³⁴

Skyrocketing diabetes risk: African-American and Latino children are developing type 2 diabetes at much higher rates than their non-Hispanic white peers. Almost half are at risk of developing diabetes.²³⁵

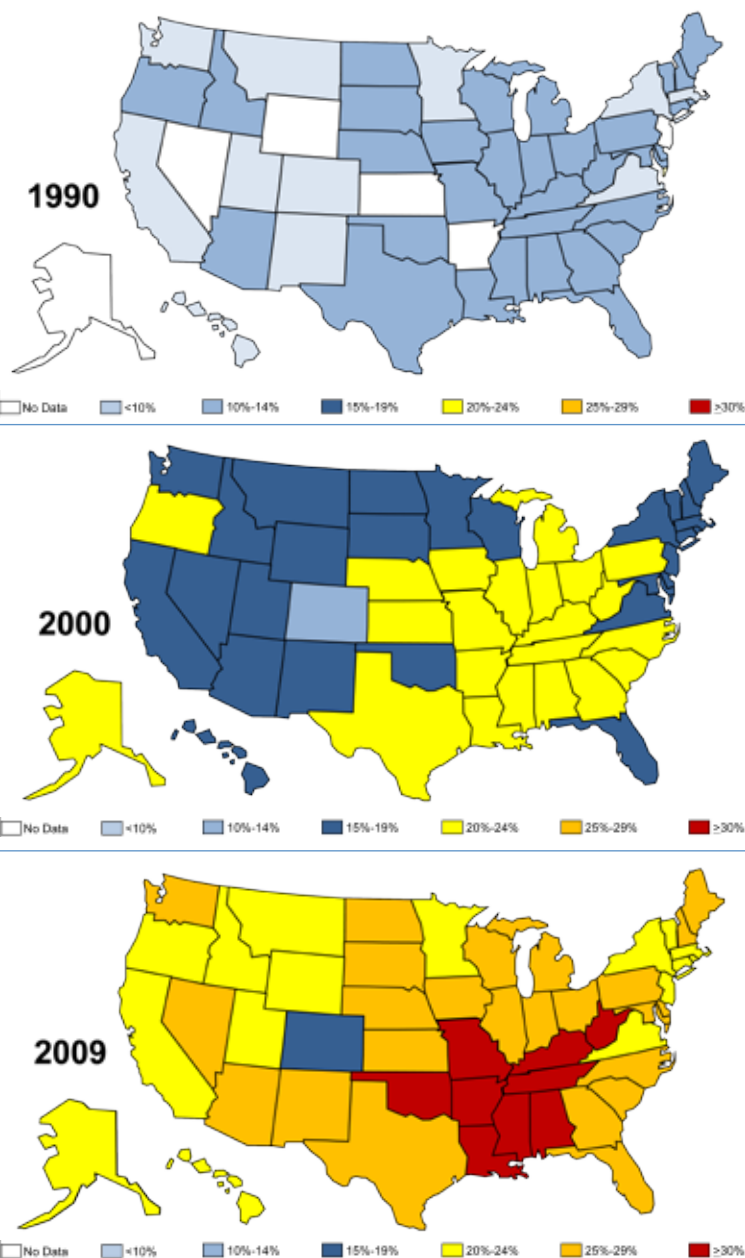
Adult obesity rates for African-Americans and Latinos are higher than those for non-Hispanic whites in nearly every state.²³⁶ In one study, there were large race/ethnic disparities in obesity prevalence among women. About 53 percent of African-American women and 51 percent of Latino women ages 40–59 were obese compared with about 39 percent of non-Hispanic white women of the same age. Among women age 60 and older, 61 percent of African-American women were obese compared with 37 percent of Latino women and 32 percent of non-Hispanic white women.²³⁷

Obesity is twice as common in young American Indian/Native Alaskan children as it is in white and Asian children. Obesity prevalence is higher in Latino and African-American children than it is in non-Hispanic whites and Asians. Research offers evidence that obesity prevalence differs among racial and ethnic groups in the United States in children as young as age 4.²³⁸

Geographic Disparities

Obesity and obesity-related diseases such as diabetes and hypertension continue to remain the highest in the South. Since 1990 every state in the United States has seen an increase in the prevalence of obesity.²⁴⁰

Percent of Obese (BMI >30) U.S. Adult



2009 State Obesity Rates

State	%	State	%	State	%	State	%
Alabama	31.0	Illinois	26.5	Montana	23.2	Rhode Island	24.6
Alaska	24.8	Indiana	29.5	Nebraska	27.2	South Carolina	29.4
Arizona	25.5	Iowa	27.9	Nevada	25.8	South Dakota	29.6
Arkansas	30.5	Kansas	28.1	New Hampshire	25.7	Tennessee	32.3
California	24.8	Kentucky	31.5	New Jersey	23.3	Texas	28.7
Colorado	18.6	Louisiana	33.0	New Mexico	25.1	Utah	23.5
Connecticut	20.6	Maine	25.8	New York	24.2	Vermont	22.8
Delaware	27.0	Maryland	26.2	North Carolina	29.3	Virginia	25.0
Washington, D.C.	19.7	Massachusetts	21.4	North Dakota	27.9	Washington	26.4
Florida	25.2	Michigan	29.6	Ohio	28.8	West Virginia	31.1
Georgia	27.2	Minnesota	24.6	Oklahoma	31.4	Wisconsin	28.7
Hawaii	22.3	Mississippi	34.4	Oregon	23.0	Wyoming	24.6
Idaho	24.5	Missouri	30.0	Pennsylvania	27.4		

Source: Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction. The American Heart Association's Strategic Impact Goal Through 2020 and Beyond. *Circulation*. 2010;121:586–613.

Economic Disparities

Childhood obesity is having a greater impact on children from low-income families. Due to low income and a lack of access to food stores, more than 30 million people in the U.S. suffer from hunger and food insecurity each year.²⁴¹ In fact, many low-income communities have fewer opportunities available to stay healthy. Today 23.5 million people (8.4 percent of the U.S. population) are living in low-income neighborhoods that are more than a mile away from a supermarket.²⁴² In the past, access to supermarkets and other healthy food stores was associated with a lower BMI, a lower prevalence of overweight adults, and a lower prevalence of obesity,²⁴³ but this may no longer be the case. Studies show that as income increases, adults tend to eat healthier foods and exercise more frequently.²⁴⁴ Individuals most affected by obesity as a result of hunger and food insecurity may be those living in low-income neighborhoods.

Many poorer families have less access to health clubs, sports facilities or organized sports leagues for children.²⁴⁵ Also, the communities where they live tend to offer fewer opportunities to stay healthy (such as access to a supermarket).²⁴⁶ Many lower-income families also have less access to health care. In 2004 more than 1.6 million children were unable to get needed medical care because the family could not afford it; medical care for an additional 3 million children was delayed because of cost. Less access to health care means children are less likely to be diagnosed with obesity and treated for it.²⁴⁷

Food prices can have a significant impact on weight. Price increases for unhealthy foods (such as fast food and sugar-laden products) and price decreases for fruits, vegetables and other healthy foods are associated with lower body weight and a decreased likelihood of obesity. This is especially likely among children and adolescents and other at-risk populations.²⁴⁸

Disparities in Access to Healthy Foods

People in some communities have limited opportunities to make healthy food choices. In general, poorer areas and non-white areas tend to have fewer fruit and vegetable markets, bakeries, specialty stores and natural food stores.²⁴⁹ In a study of 200

neighborhoods, there were three times as many supermarkets in wealthy neighborhoods as in poor neighborhoods, leaving fast-food restaurants as the most convenient meal option for many low-income families.²⁵⁰ Access to supermarkets and other food stores is significant because access to healthy food outlets is associated with a lower mean BMI, a lower prevalence of overweight adults and a lower prevalence of obesity.²⁵¹

Researchers found that the presence of a fast-food restaurant within one-tenth of a mile of a school was associated with an approximate increase of 5 percent in that school's obesity rate. Additionally, youth who attend schools within a half mile of a fast-food outlet eat less fruit and vegetables, consume more soda and are more likely to be obese than their peers attending schools located farther from such restaurants.²⁵²

Disparities in Physical Activity and Access to Facilities

Children's physical activity levels may be influenced — positively or negatively — by the environment in which they live.^{253, 254} Access to parks is a key environmental factor that may impact physical activity levels.^{255, 256} Children who live near parks and other green spaces are more physically active.²⁵⁷ In fact, having a park near one's home is more important than the size of the park itself; people are more likely to use their neighborhood park even if a larger park is just a few miles away.²⁵⁸

Children and adolescents living in communities with parks, playgrounds, trails and recreation programs tend to be more physically active than those living in neighborhoods with fewer recreational facilities.²⁵⁹ In one study, children who had access to playground equipment were observed to be 84 percent more physically active over two years than children in neighborhoods without equipment.²⁶⁰

Families living in a mobile home or in remote or rural area are less likely to live near a park or playground.²⁶¹ Minority adolescents and those from families with lower socioeconomic status have less access to facilities for physical activity (parks, playgrounds, walking paths, etc.).²⁶²

2020 Health Impact Metrics for Adults and Children

Metric	Age	Poor Health	Intermediate Health	Ideal Health
Current smoking	Adults > 20	Yes	In prior 12 months	Never or Quit > 12 months ago
	Children 12–19	In prior 30 days	Ever or experimenting	Never
BMI	Adults > 20	≥30 kg/m ²	25–29.9 kg/m ²	<25 kg/m ²
	Children 12–19	≥95th percentile	85th–95th percentile	<85th percentile
Physical Activity	Adults > 20	None	1–149 min/wk Moderate or 1–74 min/wk Vigorous or 1–149 min/wk Moderate + Vigorous	≥150 min/wk Moderate or ≥75 min/wk Vigorous or ≥150min/wk Moderate + Vigorous
	Children 12–19	None	0–≤60 minutes each day Moderate or vigorous	≥60 minutes each day Moderate or vigorous
Healthy Diet Score	Adults > 20	0–1 Factors	2–3 Factors	4–5 Factors
	Children 5–19	0–1 Factors	2–3 Factors	4–5 Factors
Total Cholesterol	Adults > 20	≥240	200–239 or treated to goal	<200
	Children 6–19	≥200	170–199	<170
Blood Pressure	Adults > 20	SBP >140 or DBP ≥90	SBP 120–139 or DBP 80–89 or treated to goal	<120/<80
	Children 8–19	>95th percentile	90th–95th percentile or SBP ≥120 or DBP ≥80	<90th percentile
Fasting Glucose	Adults > 20	≥126	100–125 or treated to goal	<100
	Children 12–19	≥126	100–125	<100

Source: Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction. The American Heart Association's Strategic Impact Goal Through 2020 and Beyond. *Circulation*. 2010;121:586–613.

Healthy Diet Score: 5 primary components, 4–5 diet goals must be met for ideal CV health

Measure	Definition
Fruits & Vegetables	≥ 4.5 cups per day
Fish (preferably oily fish)	≥ 2, 3.5-oz. servings per week
Sodium	< 1,500 mg per day
Sweets/sugar sweetened beverages	≤ 450 kcal (36 oz) per week
Whole Grains (≥1.1 grams fiber per 10 grams carbohydrate)	≥ 3, 1 oz equivalent servings per day

Source: Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction. The American Heart Association's Strategic Impact Goal Through 2020 and Beyond. *Circulation*. 2010;121:586–613.

Healthy Diet Score: 3 secondary components

Saturated Fat	<7% of total energy intake (calories)
Nuts, Legumes & Seeds	≥ 4 servings per week
Processed Meats	≤ 2 servings per week
NOTE: <i>Trans</i> fat not measured in national data sets (NHANES); therefore, data is not available to measure consumption	

Source: Lloyd-Jones DM, Hong Y, Labarthe D, et al. Defining and Setting National Goals for Cardiovascular Health Promotion and Disease Reduction. The American Heart Association's Strategic Impact Goal Through 2020 and Beyond. *Circulation*. 2010;121:586–613.

Almost no children in the United States ages 5–19 have ideal health as it relates to the American Heart Association's Healthy Diet Score. In fact, less than 0.5 percent do.²⁶³

Tips for the American Heart Association's Healthy Eating Plan²⁶⁴

A healthy diet and active lifestyle are your best weapons against heart disease and stroke. Eating right helps fend off four controllable risk factors for cardiovascular disease: being obese or overweight, high cholesterol, high blood pressure and type 2 diabetes.

To maintain a healthy lifestyle, the American Heart Association recommends:

- **Don't Smoke:** Avoid use of and exposure to tobacco products. Smoking is the No. 1 cause of preventable death in the U.S.
- **Get Moving:**
 - Adults need at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, or 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous intensity aerobic activity. Aerobic activity should be performed in episodes of at least 10 minutes, and preferably, it should be spread throughout the week.
 - The amount of physical activity needed to achieve and maintain weight loss depends on caloric intake and varies from person to person. An adult may need to increase physical activity to a total 300 minutes per week.
 - Children need 60 minutes of moderate to vigorous-intensity physical activity each day.
- **Eat Right:**
 - Balance caloric intake and physical activity to maintain a healthy body weight (this means not eating excess calories that you don't need).
 - Consume a diet rich in a variety of deeply colored fruits and vegetables. A typical adult should strive for 9–10 servings of fruits and vegetables every day.

- Choose fiber-rich whole grains. A diet rich in fiber can help promote weight loss because fiber keeps you feeling fuller longer so you eat less.
- Eat a 3.5 oz serving of fish, especially oily fish like salmon or albacore tuna, at least twice a week to get omega-3 fatty acids.
- Limit saturated and *trans* fat and cholesterol by choosing lean meats, poultry (no skin), selecting fat-free (skim), 1% and low-fat dairy products and avoiding hydrogenated fats (margarine, shortening, cooking oils and the foods made from them).
- Limit of added sugars from food and beverages you consume to no more than half of your daily discretionary calorie allowance. For most American women, this is no more than 100 calories per day and no more than 150 calories per day for men (or approximately 6 teaspoons/day for women and 9 teaspoons/day for men).
- Choose and prepare foods with little or no salt (sodium) to maintain a healthy blood pressure. Keep sodium intake to less than 1,500 mg/day.
- If you consume alcohol, do so in moderation. This means an average of one to two drinks per day for men and one drink per day for women. (A drink is one 12 oz. beer, 4 oz. of wine, 1.5 oz. of 80-proof spirits, or 1 oz. of 100-proof spirits.)
- If you eat out, pay attention to portion size and the amount of calories in your meal.

Tips for Parents to Implement AHA Pediatric Dietary Guidelines

- Reduce added sugars, including sugar-sweetened drinks and juices.
- Use canola, olive, soybean, corn oil, safflower oil or other unsaturated oils in place of solid fats during food preparation.
- Use recommended portion sizes on food labels when preparing and serving food.

- Use fresh, frozen and canned vegetables and fruits without added saturated fat, *trans* fat, salt (sodium) and added sugars; serve them at every meal and for a snack too.
- Introduce and regularly serve fish as an entrée.
- Remove the skin from poultry before eating.
- Use only lean cuts of meat and reduced-fat meat products.
- Limit high-calorie sauces such as Alfredo, cream sauces, cheese sauces and hollandaise.
- Eat fiber-rich whole-grain breads and cereals rather than refined products; read labels and ensure that whole grain is the first ingredient on the food label of these products.
- Eat more legumes (beans) and tofu in place of meat for some entrées.
- Breads, breakfast cereals and prepared foods, including soups, may be high in salt and/or sugar; read food labels for content and choose high-fiber, low-salt/low-sugar alternatives.

Pediatric Dietary Strategies for Ages 2 and Older

- Balance dietary calories with physical activity to maintain normal growth and/or weight.
- Eat a variety of deeply colored vegetables and fruits daily and limit juice intake.
- Use vegetable oils and soft margarines low in saturated fat and *trans* fatty acids instead of butter or most other animal fats.
- Eat fiber-rich whole-grain breads and cereals rather than refined grain products.
- Reduce the intake of sugar-sweetened beverages and foods.
- Use fat-free (skim) or low-fat (1 percent) milk and dairy products daily.
- Eat more fish, especially oily fish, broiled or baked.
- Reduce salt intake, including salt from processed foods.

Recommendation for Added Sugars²⁶⁵

- Limit sugar-sweetened beverages to no more than 450 calories (36 oz.) per week.
- Most American women should consume no more than 100 calories of added sugars per day; most men, no more than 150 calories. That's about 6 teaspoons of added sugars a day for women and 9 for men. The average intake of added sugars for all Americans is 22.2 teaspoons per day or about 355 calories.²⁶⁶
- Added sugars and solid fats in food, as well as alcoholic beverages, are categorized as “discretionary calories” and should be consumed sparingly.
- Soft drinks and other sugar-sweetened beverages are the No. 1 source of added sugars in the American diet. A 12-ounce can of regular soda contains about 130 calories and 8 teaspoons of sugar.

Recommendation for Sodium²⁶⁷

- Less than 1,500 mg of sodium is recommended.
- Sodium consumption is currently more than two times higher than the recommended limit, with 77 percent coming from packaged, processed and restaurant foods.

Recommendation for children⁷⁵

Age	1 year	2–3 years	4–8 years	9–13 years	14–18 years
Calories*					
Female	900	1,000	1,200	1,600	1,800
Male	900	1,000	1,400	1,800	2,200
Fat	30–40% kcal	30–35% kcal	25–35% kcal	25–35% kcal	25–35% kcal
Milk/dairy†	2 cups	2 cups	2 cups	3 cups	3 cups
Lean meat/beans‡					
Female	1.5 oz	2 oz	3 oz	5 oz	5 oz
Male	1.5 oz	2 oz	4 oz	5 oz	6 oz
Fruits§					
Female	1 cup	1 cup	1.5 cups	1.5 cups	1.5 cups
Male	1 cup	1 cup	1.5 cups	1.5 cups	2 cups
Vegetables§					
Female	3/4 cup	1 cup	1 cup	2 cups	2.5 cups
Male	3/4 cup	1 cup	1.5 cups	2.5 cups	3 cups
Grains¶					
Female	2 oz	3 oz	4 oz	5 oz	6 oz
Male	2 oz	3 oz	5 oz	6 oz	7 oz

*Calorie estimates are based on a sedentary lifestyle. Increased physical activity will require additional calories: by 0–200 kcal/d if moderately physically active; and by 200–400 kcal/d if very physically active.

†Milk listed is fat-free (except for children under age 2). If 1%, 2% or whole-fat milk is substituted, this will use, for each cup, 19, 39 or 63 kcal of discretionary calories and add 2.6, 5.1 or 9.0 g of total fat, of which 1.3, 2.6 or 4.6 g are saturated fat.

‡Lean meat/beans includes lean poultry without skin, fish, beans, peas (not green beans and green peas), nuts and seeds.

§Serving sizes are ¼ cup for 1 year of age, ½ cup for 2 to 3 years of age and ½ cup for ≥4 years of age. A variety of fruits and vegetables should be selected daily, while limiting juice intake.

¶Half of all grains should be whole grains.

For 1-year-old children, calculations are based on 2% fat milk. If 2 cups of whole milk are substituted, 48 kcal of discretionary calories will be used. The American Academy of Pediatrics recommends that low-fat/reduced fat milk not be started before 2 years of age.

Recommendations for Adults Ages 18 and Older (based on 2,000-calorie goal⁷⁶)

Grains*	6 to 8 servings per day
Vegetables	4 to 5 servings per day
Fruits	4 to 5 servings per day
Fat-free or low-fat milk and dairy products	2 to 3 servings per day
Lean meats, poultry (skinless) and fish†	less than 6 oz per day
Nuts, seeds and legumes	4 to 5 servings per week
Fats and oils	2 to 3 servings per day
Sweets and added sugars	Limit sugar-sweetened beverages to < 450 calories (36 oz) or less per week. Limit added sugars: women not more than 100 calories per day and men no more than 150 calories per day from added sugars in food or beverages.

*At least half of the grains should be fiber-rich whole grains.

†Fish: Include at least two 3.5 oz. servings per week (preferably oily fish)

Health and Human Services Physical Activity Guidelines²⁶⁸

Children and Adolescents (ages 6–17)

- Children and adolescents should do 60 minutes or more of physical activity every day.
- Most daily activity should be either moderate- or vigorous-intensity aerobic physical activity.
- Children and adolescents should do vigorous-intensity activity at least three days a week. They also should do muscle-strengthening and bone-strengthening activity at least three days a week as part of their 60 minutes of daily physical activity.

Adults (ages 18–64)

- Adults should do two hours and 30 minutes a week of moderate-intensity aerobic physical activity, or one hour and 15 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of each. Aerobic activity should be performed in episodes of at least 10 minutes, preferably spread throughout the week.
- Additional health benefits are provided by increasing to five hours a week of moderate-intensity aerobic physical activity, or two hours and 30 minutes a week of vigorous-intensity physical activity, or an equivalent combination of both.

- Adults should also do muscle-strengthening activities that involve all major muscle groups performed on two or more days per week.

Older Adults (65 and Older)

- Older adults should follow the adult guidelines. If this is not possible due to limiting physical conditions, they should be as physically active as their abilities allow. Older adults should do exercises that maintain or improve balance if they are at risk of falling.

Some activity is better than none. Physical activity is safe for almost everyone, and the health benefits far outweigh the risks. People without diagnosed chronic conditions (such as diabetes, heart disease or osteoarthritis) who do not have symptoms (e.g., chest pain or pressure, shortness of breath, dizziness, or joint pain) generally do not need to consult with a healthcare provider before starting physical activity.

Children and Adolescents with Disabilities

Work with the child’s healthcare provider to identify the appropriate types and amounts of physical activity. When possible, these children should meet the guidelines for children and adolescents — or as much activity as their condition allows. Children and adolescents should avoid being inactive.

Health Benefits of Physical Activity — A Review of the Strength of the Scientific Evidence

Adults and Older Adults

Strong Evidence	Moderate-to-Strong Evidence	Moderate Evidence
<ul style="list-style-type: none"> • Lower risk of: <ul style="list-style-type: none"> — Early death — Heart disease — Stroke — Type 2 diabetes — High blood pressure — Adverse blood lipid profile — Metabolic syndrome — Colon and breast cancer • Prevention of weight gain • Weight loss when combined with diet • Improved cardiorespiratory and muscular fitness • Prevention of falls • Reduced depression • Better cognitive function (older adults) 	<ul style="list-style-type: none"> • Better functional health (older adults) • Reduced abdominal obesity 	<ul style="list-style-type: none"> • Weight maintenance after weight loss • Lower risk of hip fracture • Increased bone density • Improved sleep quality • Lower risk of lung and endometrial cancers

Children and Adolescents

Strong Evidence	Moderate Evidence
<ul style="list-style-type: none"> • Improved cardiorespiratory endurance and muscular fitness • Favorable body composition • Improved bone health • Improved cardiovascular and metabolic health biomarkers 	<ul style="list-style-type: none"> • Reduced symptoms of anxiety and depression

For more information, visit health.gov/paguidelines.

Solutions

American Heart Association

The American Heart Association is devoted to saving people from heart disease and stroke — America's No. 1 and No. 3 killers. We team with millions of volunteers to fund innovative research, fight for stronger public health policies, and provide lifesaving tools and information to prevent and treat these diseases. The Dallas-based association is the nation's oldest and largest voluntary organization dedicated to fighting heart disease and stroke. To learn more or join us, call 1-800-AHA-USA1 or any of our offices around the country, or visit heart.org.

Our mission is to build healthier lives, free of cardiovascular diseases and stroke. That single purpose drives all we do. Our goal is to improve the cardiovascular health of all Americans by 20 percent while reducing deaths from cardiovascular diseases and stroke by 20 percent by 2020. We want to accomplish that by empowering you and your loved ones to save lives, live healthier and enjoy more peace of mind about cardiovascular health.

To learn more or join us, call 1-800-AHA-USA1 or any of our offices around the country, or visit heart.org.

Healthier Kids

Childhood obesity can be stopped. And it doesn't take high-tech treatments or cutting-edge medications. The solution begins and ends with the daily decisions we make. The American Heart Association is working to help kids and families live heart-healthy lives. Find out what you can do to create a nation of healthier kids at heart.org/healthierkids.

NFL PLAY 60 Challenge

The National Football League and the American Heart Association have teamed up to create the NFL PLAY 60 Challenge, a program that inspires kids to get the recommended 60 daily minutes of physical activity in school and at home. Schools enrolled in the NFL PLAY 60 Challenge become places that encourage physically active lifestyles year-round. To register and learn more, visit heart.org/nflplay60challenge.

Jump Rope For Heart/Hoops For Heart

Jump Rope For Heart

Jump Rope For Heart engages elementary students in jumping rope while raising funds to support lifesaving heart and stroke research. This educational program teaches physical fitness and promotes the value of community service to students and their families. Learn more at heart.org/jumpropeforheart.

Hoops For Heart

Hoops For Heart teaches middle school students basketball skills while raising funds to support lifesaving heart and stroke research and educational programs to reduce disability and death from heart disease and stroke. Learn more at heart.org/hoopsforheart.

Advocating for Children's Health

The American Heart Association supports numerous policy issues related to children's health including efforts to improve quality physical education and school nutrition through state and federal legislation. Find out more about our issues and advocacy campaigns at heart.org/obesitypolicy.

The American Heart Association/American Stroke Association strongly support the Fitness Integrated with Teaching Kids Act (FIT Kids Act). The FIT Kids Act supports quality physical education for all public school children through grade 12. It ensures that kids are active during the school day and learn how to be personally responsible for their health through exercise and a healthy diet. Physical activity is the most important component of any program to reduce the epidemic of childhood obesity and may also reduce tobacco use, insomnia, depression and anxiety. Research also indicates that fit and active children learn more effectively and achieve more academically. Our children need a head start on a healthy life. For more information on the FIT Kids Act, visit FITkidsact.org.

Alliance for a Healthier Generation

Founded in 2005 by the American Heart Association and William J. Clinton Foundation, the Alliance for a Healthier Generation is leading the charge against the childhood obesity epidemic by engaging directly with industry leaders, educators, parents, healthcare professionals and — most importantly — kids. The goal of the Alliance is to reduce the nationwide prevalence of childhood obesity by 2015 and to inspire young people to develop lifelong healthy habits. Under the Alliance, we have made schools healthier, negotiated provider reimbursement for the prevention and treatment of childhood obesity and raised awareness in children and adults about the importance of getting healthy to prevent childhood obesity. For more information please visit healthiergeneration.org.

CPR in schools

It may be the most valuable lesson a student can learn: How to save the life of a loved one, teacher or friend by performing the simple steps of CPR. It can double or triple a cardiac arrest victim's chance of survival, making the difference between life and death for a loved one.

The American Heart Association offers a comprehensive portfolio of credentialed courses and awareness programs to train middle and high school students. With options for adult, child and infant CPR, relief of choking and use of an (AED) automated external defibrillator, the American Heart Association has a training solution to meet every school's need. Visit heart.org/cpr to learn more.

Be the Beat

The American Heart Association is training the next generation of lifesavers. Be the Beat is for teens and tweens who want to help drive awareness of cardiac arrest and the importance of CPR and AEDs through a fun, interactive website. For more information, visit BeththeBeat.heart.org.

Educator Portal

A healthy school environment can result in greater academic achievement, and healthier students and school staff. Download lesson plans, activities and other resources for teachers at heart.org/educator.

Appendix A: Body Mass Index

Body mass index (BMI) is a calculation used to estimate body fat. It is used as a screening tool to identify weight problems in adults and children. BMI is calculated differently in children and adults because the amount of body fat changes with age. Also, BMI in children is age- and gender-specific because body fat differs based on growth rates and developmental differences in boys and girls.

How to Calculate BMI in Adults

In adults over age 20, BMI is calculated using a mathematical calculation based on height and weight. It is calculated by dividing body weight in pounds by height in inches squared, then multiplying the number by 703.

$$\text{BMI} = \frac{(\text{Weight in Pounds})}{(\text{Height in inches}) \times (\text{Height in inches})} \times 703$$

For adults over age 20, BMI values of:

- Less than 18.5 are considered underweight.
- 18.5 to less than 25 are considered normal weight.
- 25.0 to less than 30.0 are considered overweight. A BMI of about 25 corresponds to about 10 percent over ideal body weight.
- 30.0 or greater are considered obese, or about 30 pounds or more overweight. Extreme obesity is defined as a BMI of 40 or greater.

To calculate your BMI, visit heart.org/bmi or use the table below find your approximate BMI.

Height	Minimal risk (BMI under 25)	Moderate risk (BMI 25–29.9) Overweight	High risk (BMI 30 and above) Obese
4'10"	118 lbs. or less	119–142 lbs.	143 lbs. or more
4'11"	123 or less	124–147	148 or more
5'0"	127 or less	128–152	153 or more
5'1"	131 or less	132–157	158 or more
5'2"	135 or less	136–163	164 or more
5'3"	140 or less	141–168	169 or more
5'4"	144 or less	145–173	174 or more
5'5"	149 or less	150–179	180 or more
5'6"	154 or less	155–185	186 or more
5'7"	158 or less	159–190	191 or more
5'8"	163 or less	164–196	197 or more
5'9"	168 or less	169–202	203 or more
5'10"	173 or less	174–208	209 or more
5'11"	178 or less	179–214	215 or more
6'0"	183 or less	184–220	221 or more
6'1"	188 or less	189–226	227 or more
6'2"	193 or less	194–232	233 or more
6'3"	199 or less	200–239	240 or more
6'4"	204 or less	205–245	246 or more

There are a few important considerations to note. One is that BMI can be misleading for very muscular people, as well as women who are pregnant or lactating. BMI may overestimate body fat in those cases. Conversely, it may underestimate body fat in older people who have lost muscle mass.

How is BMI Measured in Children and Teens?

BMI in children (ages 2–20) is calculated using a child's weight and height and is then used to find the corresponding BMI-for-age percentile for a child's age and sex. BMI-for-age percentile shows how a child's weight compares to that of other children of the same age and sex. For example, a BMI-for-age percentile of 65 means that the child's weight is greater than that of 65 percent of other children of the same age and sex. BMI-for-age weight status categories and the corresponding percentiles are used as a screening tool to help identify children that are underweight, normal weight, overweight or obese.

Children and teens whose BMI-for-age is:

- In the 95th percentile or higher are considered obese.
- Between the 85th and less than the 95th percentile are considered overweight.
- Between the 5th and less than the 85th percentile are considered normal weight.
- Below the 5th percentile are considered underweight.

Clinical growth charts are used to calculate BMI in children and adolescents. Visit the Centers for Disease Control and Prevention's free online BMI calculators for children and teens at <http://apps.nccd.cdc.gov/dnpabmi/> or use the growth charts below. Knowing your risk is the first step!

It's important to remember that BMI is a tool. It does not always accurately describe a child's (or an adult's) weight classification, so a doctor or healthcare professional should make the final determination.

Appendix B: Resources

AHA Scientific Statements and AHA Recommendations

Children

Cardiovascular Health in Childhood

(*Circulation*. 2002;106:143)

American Heart Association Guidelines for Primary Prevention of Atherosclerotic Cardiovascular Disease Beginning in Childhood

(*Circulation*. 2003;107:1562)

Obesity, Insulin Resistance, Diabetes, and Cardiovascular Risk in Children

(*Circulation*. 2003;107:1448)

Cardiovascular Health Promotion in Schools

(*Circulation*. 2004;110:2266)

Overweight in Children and Adolescents

(*Circulation*. 2005;111:1999–2012)

American Heart Association Dietary Guidelines for Children and Adolescents

(*Circulation*. 2005;112:2061–2075.)

Promoting Physical Activity in Children and Youth. A Leadership Role for Schools

(*Circulation*. 2006;114:1214–1224)

Implementing American Heart Association Pediatric and Adult Nutrition Guidelines

(*Circulation*. 2009;119:1161–117)

Adults

American Heart Association Guidelines for Primary Prevention of Cardiovascular Disease and Stroke: 2002 Update

(*Circulation*. 2002;106:388)

American Heart Association Guide for Improving Cardiovascular Health at the Community Level

(*Circulation*. 2003;107:645)

Exercise and Physical Activity in the Prevention and Treatment of Atherosclerotic Cardiovascular Disease

(*Circulation*. 2003;107:3109)

Circulation, special obesity-themed issue, April 19, 2005

Obesity and Heart Disease

(*Circulation*. 2006;113:898–918)

Preventing Cardiovascular Disease and Diabetes : A Call to Action from the American Diabetes Association and the American Heart Association

(*Circulation*. 2006;113:2943–2946.)

American Heart Association Dietary Guidelines Revision 2006

(*Circulation*. 2006;114:82–96)

ACSM/AHA Physical Activity and Public Health: Updated Recommendation for Adults

(*Circulation*. 2007;116(9):1081)

Resistance Exercise in Individuals With and Without Cardiovascular Disease: 2007 Update

(*Circulation*. 2007;116(5):572)

Population-Based Prevention of Obesity: The Need for Comprehensive Promotion of Healthful Eating, Physical Activity, and Energy Balance

(*Circulation*. 2008;118(4):428)

Implementing American Heart Association Pediatric and Adult Nutrition Guidelines

(*Circulation*. 2009;119:1161–117)

Dietary Sugars Intake and Cardiovascular Health

(*Circulation*. 2009;120:1011–1020)

Interventions to Promote Physical Activity and Dietary Lifestyle Changes for Cardiovascular Risk Factor Reduction in Adults

(*Circulation*. 2010;122:406–441)

The Importance of Population-Wide Sodium Reduction as a Means to Prevent Cardiovascular Disease and Stroke

(*Circulation*. 2011;123:00–00)

Effectiveness-Based Guidelines for the Prevention of Cardiovascular Disease in Women—2011 Update

(*Circulation*. 2011;123:00–00)

Healthy Living Programs for Adults

- **My Heart. My Life.™**

The American Heart Association's *My Heart. My Life.* prevention platform is a comprehensive new health, wellness and fitness initiative to empower Americans to get healthier. It's an important component of the American Heart Association's sweeping national goal: to improve the cardiovascular health of all Americans by 20 percent and to reduce deaths from cardiovascular disease and stroke by 20 percent by the year 2020. To help accomplish this goal, the American Heart Association will launch innovative campaigns in communities across America focused on eating and cooking healthier meals, getting daily exercise and learning about how to grow nutritious food. These programs are each designed to encourage group participation among children and adults, and to draw communities together with the common goal of improving health through fun, engaging activities. Communities will benefit from new playgrounds, new walking paths for walking clubs, family fitness toolkits, enriching educational programs for students in at-risk areas and much more. Visit MyHeartMyLife.org for more information.

- **Nutrition Center**

Good nutrition is one of the most important factors for determining your heart health. That's why it's so vital for you and your family to eat healthy every day of the year. Before you know it, your family's food decisions will put you all on the road to healthier hearts and longer lives! Find out how at heart.org/nutrition.

- **Food Certification Program**

Look for the American Heart Association's heart-check mark on the food label to quickly and easily find heart-healthy foods in the grocery store. When you see the heart-check mark, you'll know instantly that the food had been certified to meet the association's criteria for saturated fat and cholesterol. Learn more at heartcheckmark.org.

- **Go Red For Women/Go Red Por Tu Corazón**

Go Red For Women is a nationwide movement encouraging women to make it their mission to fight heart disease, the No. 1 killer of American women, by making heart-healthy choices and reducing their personal risk. Enroll today at goredforwomen.org.

- **Power To End Stroke**

Stroke is the No. 3 cause of death in Americans, and African-Americans face almost twice the risk of first-ever stroke compared with whites. Power To End Stroke is an education and awareness program that embraces and celebrates the culture, energy, creativity and lifestyles of African-Americans. Register online for free information and tools at powertoendstroke.org.

- **Heart of Diabetes/El Corazón y la Diabetes**

This national education and awareness campaign provides educational information and tools to help you manage type 2 diabetes. It includes a supporting website in English and Spanish. Enroll online at iknowdiabetes.org.

- **You're the Cure**

You're the Cure advocates are part of a nationwide network of people working to contact legislators to ask for important public health policies that can save lives by helping to end heart disease and stroke. Visit yourethecure.org today!

- **HeartHub**

This award-winning online education portal has the latest heart and stroke information, tips and guidelines. The website also features interactive tools, trackers, videos, medical animations, a glossary and the latest health news. Learn more at hearthub.org.

- **Heart360**

Patients can have a convenient and secure location to track and manage personal heart health. Record your health data with our online trackers, access additional information and resources on how to be heart-healthy, and even share your results with your provider at heart360.org.

- **Life's Simple 7**

My Life Check was designed by the American Heart Association with the goal of improved health by educating the public on how best to live. This simple list of seven behaviors and factors has been developed to deliver on the hope we all have — to live a long, productive healthy life. Find out more at mylifecheck.heart.org.

Policy statements that will not be published but can be accessed online at

- Guidance on competitive food policy in schools
- Menu labeling in restaurants
- The importance of quality physical education in schools
- Front-of-Package and Retail Shelf Food Icon Systems
- Analysis of the IOM Report on Nutrition Standards in Schools
- EMS Stroke Systems
- Prevention and Treatment of Childhood Obesity in the Healthcare Environment
- Food Marketing and Advertising to Children
- Regulatory and Legislative Efforts to Improve Cardiovascular Health by Decreasing Consumption of Industrially Produced *Trans* Fats
- Position Statement on Beverage Taxes and Obesity Prevention
- BMI Surveillance/Assessment in Schools
- Obesity Prevention in Child Care Centers and Early Childhood
- The Impact of Smoke Free Laws on Cardiovascular Disease in Communities: A Case for Policy
- The Sale of Tobacco in Pharmacies
- Chemicals/Pollutants in the Environment and Obesity
- Pulse Oximetry Screening for Newborns (new)



Appendix C: For More Information

General Childhood Obesity

American Heart Association Childhood Obesity Research Summit Report, American Heart Association (2009)

<http://circ.ahajournals.org/cgi/reprint/CIRCULATIONAHA.109.192216>

Interventions to Promote Physical Activity and Dietary Lifestyle Changes for Cardiovascular Risk Factor Reduction in Adults: A Scientific Statement From the American Heart Association, American Heart Association (2010)

<http://circ.ahajournals.org/cgi/content/short/122/4/406>

The Surgeon General's Call to Action to Prevent & Decrease Overweight and Obesity, U.S. Department of Health & Human Services (2001)

<http://www.surgeongeneral.gov/topics/obesity/>

The Surgeon General's Vision for a Healthy and Fit Nation, U.S. Department of Health & Human Services (2010)

<http://www.surgeongeneral.gov/library/obesityvision/obesityvision2010.pdf>

Preventing Childhood Obesity: Health in the Balance, the Institute of Medicine of the National Academies (2005)

<http://www.iom.edu/report.asp?id=22596>

Preventing Cardiovascular Disease and Diabetes : A Call to Action from the American Diabetes Association and the American Heart Association (2006)

<http://circ.ahajournals.org/cgi/content/full/113/25/2943>

Childhood Body-Mass Index and the Risk of Coronary Heart Disease in Adulthood, New England Journal of Medicine (2007)

<http://www.nejm.org/doi/pdf/10.1056/NEJMoa072515>

Community Health Assessment and Group Evaluation (CHANGE): Building a Foundation of Knowledge to Prioritize Community Health Needs — An Action Guide, Centers for Disease Control and Prevention (2010)

<http://www.cdc.gov/healthycommunitiesprogram/tools/change/pdf/changeactionguide.pdf>

It Does, Indeed, Take a Village: Schools, Families, and Beyond for Weight Control in Children, Childhood Obesity (2010)

<http://www.liebertonline.com/doi/pdf/10.1089/chi.2010.0416>

Nutrition

2006 AHA Diet and Lifestyle Recommendations

<http://circ.ahajournals.org/cgi/content/full/114/1/82>

Dietary Guidelines for Americans, 2010. United States Department of Agriculture.

<http://www.cnpp.usda.gov/dietaryguidelines.htm>

Translating the Dietary Guidelines for Americans 2010 to Bring about Real Behavior Change, American Dietetic Association (2011)

<http://www.adajournal.org/article/PIIS0002822310018419/fulltext>

Physical Activity/Education

2010 Shape of the Nation Report: Status of Physical Education in the USA, National Association for Sport and Physical Education, American Alliance for Health, Physical Education, Recreation and Dance, and the American Heart Association

<http://www.aahperd.org/naspe/publications/upload/Shape-of-the-Nation-2010-Final.pdf>

Promoting Physical Activity in Children and Youth: A Leadership Role for Schools, American Heart Association (2006)

<http://circ.ahajournals.org/cgi/reprint/114/11/1214>

Adolescent Physical Activities as Predictors of Young Adult Weight, American Medical Association (2008)

<http://archpedi.ama-assn.org/cgi/reprint/162/1/29>

U.S. Department of Health and Human Services, 2008 Physical Activity Guidelines

<http://www.health.gov/paguidelines/>

National Physical Activity Plan

<http://www.physicalactivityplan.org/>

Make the Move: 2011 National Implementation of the U.S. Physical Activity Plan

http://www.nxtbook.com/nxtbooks/ncppa/make_the_move/index.php

Facilitating Development of a Community Trail and Promoting Its Use to Increase Physical Activity Among Youth and Adults, Centers for Disease Control and Prevention, and Partnership for Prevention (2009)

<http://www.prevent.org/actionguides/CommunityTrail.pdf>

School Health

Cardiovascular Health Promotion in the Schools, American Heart Association (2004)

<http://circ.ahajournals.org/cgi/content/full/110/15/2266?eaf>

School Policies and Practices to Improve Health and Prevent Obesity: National Elementary School Survey Results, Robert Wood Johnson Foundation

<http://www.rwjf.org/files/research/btg201006.pdf>

School Health Index, Centers for Disease Control and Prevention (CDC)

<http://apps.nccd.cdc.gov/shi/>

Working with Schools to Increase Physical Activity Among Children and Adolescents in Physical Education Classes, Centers for Disease Control and Prevention, and Partnership for Prevention (2009)

<http://www.prevent.org/actionguides/SchoolPE.pdf>

Statistics

Heart Disease and Stroke Statistics 2011 Update: A Report from the American Heart Association

http://www.heart.org/HEARTORG/General/Heart-and-Stroke-Association-Statistics_UCM_319064_SubHomePage.jsp

Centers for Disease Control and Prevention, Obesity and Overweight: Childhood Obesity

<http://www.cdc.gov/nccdphp/dnpa/obesity/childhood/index.htm>

Youth Risk Behavior Surveillance System, Centers for Disease Control and Prevention

<http://www.cdc.gov/HealthyYouth/yrbs/index.htm>

National Health and Nutrition Examination Survey, Centers for Disease Control and Prevention

<http://www.cdc.gov/nchs/nhanes.htm>

County Health Rankings, Robert Wood Johnson Foundation and the University of Wisconsin

<http://www.countyhealthrankings.org/>

State Indicator Report on Physical Activity, 2010, Centers for Disease Control and Prevention

http://www.cdc.gov/physicalactivity/downloads/PA_State_Indicator_Report_2010.pdf

State Indicator Report on Fruits & Vegetables, 2009. Centers for Disease Control and Prevention.

http://www.fruitsandveggiesmatter.gov/health_professionals/statereport.html

United States Department of Agriculture — Food Environment Atlas

<http://www.ers.usda.gov/foodatlas/>

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Page 9

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Page 20

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Page 21

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