

Understanding Adult Obesity

U.S. DEPARTMENT OF HEALTH
AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

NIDDK | NATIONAL INSTITUTE OF
DIABETES AND DIGESTIVE
AND KIDNEY DISEASES

WIN Weight-control Information Network

Today, 66 percent of adults in the United States are considered overweight or obese. Obesity puts people at increased risk for chronic diseases such as heart disease, type 2 diabetes, high blood pressure, stroke, and some forms of cancer.

The large number of people considered to be obese and the serious health risks that come with it make understanding its causes and treatment crucial. This fact sheet provides basic information about obesity: What is it? How is it measured? What causes it? What are the health risks? What can you do about it?

What is obesity?

“Obesity” specifically refers to an excessive amount of body fat. “Overweight” refers to an excessive amount of body weight that includes muscle, bone, fat, and water. There are few studies in humans that link direct measurements of total body fat to morbidity and mortality. There are also no official standards identified by the National Institutes of Health (NIH) that define obesity based on the amount or percentage of a person’s total body fat.

How is obesity measured?

Measuring the exact amount of a person’s body fat is not easy. The most accurate measures are to weigh a person underwater or in a chamber that uses air displacement to measure body volume, or to use an X-ray test called Dual Energy X-ray Absorptiometry, also known as DEXA. These methods are not practical for the average person, and are done only in research centers with special equipment.

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There are simpler methods to estimate body fat. One is to measure the thickness of the layer of fat just under the skin in several parts of the body. Another involves sending a harmless amount of electricity through a person's body. Results from these methods, however, can be inaccurate if done by an inexperienced person or on someone with extreme obesity.

Because measuring a person's body fat is difficult, health care professionals often rely on other means to diagnose obesity. Weight-for-height tables, used for decades, have a range of acceptable weights for a person of a given height. One problem with these tables is that there are many versions, all with different

weight ranges. Another problem is that they do not distinguish between excess fat and muscle. According to the tables, a very muscular person may be classified obese when he or she is not. The Body Mass Index (BMI) is less likely to misidentify a person's appropriate weight-for-height range.

Body Mass Index

The BMI is a tool used to assess overweight and obesity and monitor changes in body weight. Like the weight-for-height tables, BMI has its limitations because it does not measure body fat or muscle directly. It is calculated by dividing a person's weight in pounds by height in inches squared and multiplied by 703.

Table 1. Body Mass Index

	NORMAL						OVERWEIGHT					OBESE								EXTREME OBESITY				
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
Height (feet-inches)	Weight (Pounds)																							
4' 10"	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167	172	177	181	186	191	196	201
4' 11"	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173	178	183	188	193	198	203	208
5' 00"	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179	184	189	194	199	204	209	215
5' 01"	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185	190	195	201	206	211	217	222
5' 02"	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191	196	202	207	213	218	224	229
5' 03"	107	112	118	124	130	135	141	146	152	158	163	169	174	180	186	191	197	203	208	214	220	225	231	237
5' 04"	110	116	122	128	134	140	145	151	157	163	169	175	180	186	191	197	204	209	215	221	227	232	238	244
5' 05"	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252
5' 06"	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216	223	229	235	241	247	253	260
5' 07"	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223	230	236	242	249	255	261	268
5' 08"	125	131	138	144	151	158	164	171	177	184	190	197	204	210	216	223	230	236	243	249	256	262	269	276
5' 09"	128	135	142	149	155	162	169	176	182	189	196	203	210	216	223	230	236	243	250	257	263	270	277	284
5' 10"	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243	250	257	264	271	278	285	292
5' 11"	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250	257	265	272	279	286	293	301
6' 00"	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258	265	272	279	287	294	302	309
6' 01"	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265	275	280	288	295	302	310	318
6' 02"	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272	280	287	295	303	311	319	326
6' 03"	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279	287	295	303	311	319	327	335
6' 04"	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279	287	295	304	312	320	328	336	344

Adapted from: George Bray, Pennington Biomedical Research Center; *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report*, National Institutes of Health, National Heart, Lung, and Blood Institute, September 1998.

Men and women can have the same BMI but different body fat percentages. As a rule, women usually have more body fat than men. A bodybuilder with a large muscle mass and low percentage of body fat may have the same BMI as a person who has more body fat. However, a BMI of 30 or higher usually indicates excess body fat.

You can use Table 1 to determine your BMI. Find your height in the left-hand column labeled “Height.” Move across to your weight. The number at the top of the column is the BMI for that height and weight. Pounds have been rounded off.

A BMI of 25 to 29.9 is considered overweight. A person with a BMI of 30 or higher is considered obese. Please review your findings with your health care provider if your BMI is outside of the normal range.

Body Fat Distribution

Health care professionals are concerned not only with how much fat a person has, but also where the fat is located on the body. Women typically collect fat in their hips and buttocks, giving them a “pear” shape. Men usually build up fat around their bellies, giving them more of an “apple” shape. Of course, some men are pear-shaped and some women become apple-shaped, especially after menopause.

Excess abdominal fat is an important, independent risk factor for disease. Research has shown that waist circumference is directly associated with abdominal fat and can be used in the assessment of the risks associated with obesity or overweight. If you carry fat mainly around your waist, you are more likely to develop obesity-related health problems.

Women with a waist measurement of more than 35 inches and men with a waist measurement of more than 40 inches may have more health risks than people with lower waist measurements because of their body fat distribution.

What causes obesity?

Obesity occurs when a person consumes more calories from food than he or she burns. Our bodies need calories to sustain life and be physically active, but to maintain weight we need to balance the energy we eat with the energy we use. When a person eats more calories than he or she burns, the energy balance is tipped toward weight gain and obesity. This imbalance between calories-in and calories-out may differ from one person to another. Genetic, environmental, and other factors may all play a part.

Genetic Factors

Obesity tends to run in families, suggesting a genetic cause. However, families also share diet and lifestyle habits that may contribute to obesity. Separating genetic from other influences on obesity is often difficult. Even so, science does show a link between obesity and heredity.

Environmental and Social Factors

Environment strongly influences obesity. Consider that most people in the United States alive today were also alive in 1980, when obesity rates were lower. Since this time, our genetic make-up has not changed, but our environment has.

Environment includes lifestyle behaviors such as what a person eats and his or her level of physical activity. Too often Americans eat out,

consume large meals and high-fat foods, and put taste and convenience ahead of nutrition. Also, most people in the United States do not get enough physical activity.

Environment also includes the world around us—our access to places to walk and healthy foods, for example. Today, more people drive long distances to work instead of walking, live in neighborhoods without sidewalks, tend to eat out or get “take out” instead of cooking, or have vending machines with high-calorie, high-fat snacks at their workplace. Our environment often does not support healthy habits.

In addition, social factors including poverty and a lower level of education have been linked to obesity. One reason for this may be that high-calorie processed foods cost less and are easier to find and prepare than healthier foods, such as fresh vegetables and fruits. Other reasons may include inadequate access to safe recreation places or the cost of gym memberships, limiting opportunities for physical activity. However, the link between low socioeconomic status and obesity has not been conclusively established, and recent research shows that obesity is also increasing among high-income groups.

Cultural Factors

An individual’s cultural background may also play a role in his or her weight. For instance, foods specific to certain cultures that are prepared with a lot of fat or salt may hamper one’s weight-loss efforts. Similarly, family gatherings offering large amounts of food may make it difficult to pay attention to proper portion control and serving sizes. Lastly, research has shown that individuals originally from countries other than the United States have difficulty adjusting to the calorie-rich foods offered here. These individuals may not

be able to prepare food with the ingredients they would use in their native countries.

Although you cannot change your genetic makeup, you can work on changing your eating habits, levels of physical activity, and other environmental factors. Try these ideas:

- Learn to choose sensible portions of nutritious foods that are lower in fat.
- Learn healthier ways to make your favorite foods.
- Learn to recognize and control environmental cues (like inviting smells or a package of cookies on the counter) that make you want to eat when you are not hungry.
- Have a healthy snack an hour or two before a social gathering to prevent overeating. Mingle and talk between bites to prevent eating too much too quickly.
- Engage in at least 30 minutes of moderate-intensity physical activity (like brisk walking) on most, preferably all, days of the week.
- Take a walk instead of watching television.
- Eat meals and snacks at a table, not in front of the TV.
- Pay attention to why you are eating. Determine if you are eating because you are actually hungry or because you are bored, depressed, or lonely.
- Keep records of your food intake and physical activity.

Other Causes of Obesity

Some illnesses may lead to or are associated with weight gain or obesity. These include:

- Hypothyroidism, a condition in which the thyroid gland fails to produce enough thyroid hormone. It often results in lowered metabolic rate and loss of vigor.
- Cushing's syndrome, a hormonal disorder caused by prolonged exposure of the body's tissues to high levels of the hormone cortisol. Symptoms vary, but most people have upper body obesity, rounded face, increased fat around the neck, and thinning arms and legs.
- Polycystic ovary syndrome, a condition characterized by high levels of androgens (male hormone), irregular or missed menstrual cycles, and in some cases, multiple small cysts in the ovaries. Cysts are fluid-filled sacs.

A doctor can tell whether there are underlying medical conditions that are causing weight gain or making weight loss difficult.

Lack of sleep may also contribute to obesity. Recent studies suggest that people with sleep problems may gain weight over time. On the other hand, obesity may contribute to sleep problems due to medical conditions such as sleep apnea, where a person briefly stops breathing at multiple times during the night. (Visit http://www.win.niddk.nih.gov/publications/health_risks.htm#sleep for more information on the relationship between sleep apnea and obesity.) You may wish to talk with your health care provider if you have difficulty sleeping.

Certain drugs such as steroids, some antidepressants, and some medications for psychiatric conditions or seizure disorders may cause weight gain. These drugs may slow the rate at which the body burns calories, stimulate appetite, or cause the body to hold on to

extra water. Be sure your doctor knows all the medications you are taking (including over-the-counter medications and dietary supplements). He or she may recommend a different medication that has less effect on weight gain.

What are the consequences of obesity?

Health Risks

Obesity is more than a cosmetic problem. Many serious medical conditions have been linked to obesity, including type 2 diabetes, heart disease, high blood pressure, and stroke. Obesity is also linked to higher rates of certain types of cancer. Men who are considered obese are more likely than nonobese men to develop cancer of the colon, rectum, or prostate. Women who are considered obese are more likely than nonobese women to develop cancer of the gallbladder, uterus, cervix, or ovaries. Esophageal cancer has also been associated with obesity.

Other diseases and health problems linked to obesity include:

- Gallbladder disease and gallstones.
- Fatty liver disease (also called nonalcoholic steatohepatitis or NASH).
- Gastroesophageal reflux, or what is sometimes called GERD. This problem occurs when the lower esophageal sphincter does not close properly and stomach contents leak back—or reflux—into the esophagus.
- Osteoarthritis, a disease in which the joints deteriorate. This is possibly the result of excess weight on the joints.
- Gout, another disease affecting the joints.

- Pulmonary (breathing) problems, including sleep apnea, which causes a person to stop breathing for a short time during sleep.
- Reproductive problems in women, including menstrual irregularities and infertility.

Health care professionals generally agree that the more obese a person is, the more likely he or she is to develop health problems.

Psychological and Social Effects

Emotional suffering may be one of the most painful parts of obesity. American society emphasizes physical appearance and often equates attractiveness with slimness, especially for women. Such messages may make people considered overweight feel unattractive.

Many people think that individuals who are considered obese are gluttonous, lazy, or both. This is not true. As a result, people who are considered obese often face prejudice or discrimination in the job market, at school, and in social situations. Feelings of rejection, shame, or depression may occur.

Who should lose weight?

Health care professionals generally agree that people who have a BMI of 30 or greater can improve their health through weight loss.

This is especially true for people with a BMI of 40 or greater, who are considered extremely obese.

Preventing additional weight gain is recommended if you have a BMI between 25 and 29.9, unless you have other risk factors for obesity-related diseases. Obesity experts recommend you try to lose weight if you have two or more of the following:

- **Family history of certain chronic diseases.** If you have close relatives who have had heart disease or diabetes, you are more likely to develop these problems if you are considered obese.
- **Preexisting medical conditions.** High blood pressure, high LDL cholesterol levels, low HDL cholesterol levels, high triglycerides, and high blood glucose are all warning signs of some obesity-associated diseases.
- **Large waist circumference.** Men who have waist circumferences greater than 40 inches, and women who have waist circumferences greater than 35 inches, are at higher risk of diabetes, dyslipidemia (abnormal amounts of fat in the blood), high blood pressure, and heart disease.

Fortunately, a weight loss of 5 to 10 percent of your initial body weight can do much to improve health by lowering blood pressure and other risk factors for obesity-related diseases. In addition, research shows that a 5- to 7-percent weight loss brought about by moderate diet and exercise can delay or possibly prevent type 2 diabetes in people at high risk for the disease. In a recent study, participants who were considered overweight and had pre-diabetes—a condition in which a person's blood glucose level is higher than normal, but not high enough to be classified as diabetes—were able to delay or prevent the onset of type 2 diabetes by adopting a low-fat, low-calorie diet and exercising for 30 minutes a day, 5 days a week. For more information about pre-diabetes and diabetes, visit <http://www.diabetes.niddk.nih.gov>.

How is obesity treated?

The method of treatment depends on your level of obesity, overall health condition, and readiness to lose weight. Treatment may include a combination of diet, exercise, behavior modification, and sometimes weight-loss drugs. In some cases of extreme obesity, bariatric surgery may be recommended. (Visit <http://www.win.niddk.nih.gov/publications/gastric.htm> for more information on bariatric surgery.)

Remember, weight control is a life-long effort, and having realistic expectations about weight loss is an important consideration. Eating healthier foods and getting at least 30 minutes of moderate-intensity physical activity on most, preferably all, days of the week have important health benefits. Sixty minutes of physical activity a day may be required to prevent gradual weight gain in adulthood. Individuals who were previously considered overweight and obese are encouraged to get 60 to 90 minutes of exercise a day to sustain weight loss.

Although most adults do not need to see their health care professional before starting a moderate-intensity physical activity program, men older than 40 years and women older than 50 years who plan a vigorous program, or who have either chronic disease or risk factors for chronic illnesses, should speak with their health care provider before starting a physical activity program.

Additional Reading From the Weight-control Information Network

For more information on health risks, treatment options, and binge eating, refer to these Weight-control Information Network (WIN) publications:

Active at Any Size. February 2010. Available at <http://www.win.niddk.nih.gov/publications/active.htm>.

Binge Eating Disorder. June 2008. Available at <http://www.win.niddk.nih.gov/publications/binge.htm>.

Choosing a Safe and Successful Weight-loss Program. April 2008. Available at <http://www.win.niddk.nih.gov/publications/choosing.htm>.

Do You Know the Health Risks of Being Overweight? December 2007. Available at http://www.win.niddk.nih.gov/publications/health_risks.htm.

Healthy Eating and Physical Activity Across Your Lifespan: Better Health and You (Tips for Adults). March 2008. Available in English and Spanish at http://www.win.niddk.nih.gov/publications/better_health.htm.

Just Enough for You: About Food Portions. June 2009. Available at http://www.win.niddk.nih.gov/publications/just_enough.htm.

Weight Loss for Life. January 2009. Available at http://www.win.niddk.nih.gov/publications/for_life.htm.

For more information on NASH, visit <http://www.digestive.niddk.nih.gov/ddiseases/pubs/nash/index.htm>.

Additional Reading From Other Organizations

National Institute of Diabetes and Digestive and Kidney Diseases. *Strategic Plan for NIH Obesity Research*. U.S. Department of Health and Human Services (DHHS); NIH. 2004.

National Heart, Lung, and Blood Institute. *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*. DHHS; NIH. 1998.

National Task Force on Prevention and Treatment of Obesity. Overweight, obesity, and health risk. *Archives of Internal Medicine*. 160(7):898-904. 2000.

Partnership for Healthy Weight Management. *Weight Loss: Finding a Weight Loss Program that Works for You*. Website: <http://www.consumer.gov/weightloss/brochures.htm>. 2000.

U.S. Department of Agriculture and DHHS. *Finding Your Way to a Healthier You: Based on the "Dietary Guidelines for Americans."* Phone: 1-888-878-3256. Website: <http://www.healthierus.gov/dietaryguidelines>. 2005.

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The Weight-control Information Network (WIN) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health, which is the Federal Government's lead agency responsible for biomedical research on nutrition and obesity. Authorized by Congress (Public Law 103-43), WIN provides the general public, health professionals, the media, and Congress with up-to-date, science-based health information on weight control, obesity, physical activity, and related nutritional issues.

Publications produced by WIN are carefully reviewed by both NIDDK scientists and outside experts. This fact sheet was also reviewed by Steven N. Blair, Professor, Department of Exercise Science, Arnold School of Public Health, University of South Carolina.

This fact sheet is also available at <http://www.win.niddk.nih.gov>.

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