

# Dieting and Gallstones

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DIABETES AND DIGESTIVE  
AND KIDNEY DISEASES

WIN Weight-control Information Network

It is estimated that digestive diseases affect 60 to 70 million people in the United States. Gallbladder disease is one of the more common of these diseases. Experts estimate that as many as 20 million Americans have gallstones.

Most people with gallstones do not know that they have them and experience no symptoms. These people may have painless gallstones, or *silent gallstones*. Sometimes gallstones cause abdominal or back pain. These are called *symptomatic gallstones*. In rare cases, gallstones can cause serious health problems. Hundreds of thousands of hospitalizations and operations occur annually as a result of gallstones.

This fact sheet can help answer some of the questions you may have about gallstones:

- What are gallstones?
- What causes gallstones to develop?
- What are the symptoms of gallstones?
- Is obesity a risk factor for gallstones?
- Is weight-loss dieting a risk factor for gallstones?
- Is weight cycling a risk factor for gallstones?
- Is surgery to treat obesity a risk factor for gallstones?
- How can I safely lose weight and decrease the risk of gallstones?
- How are gallstones treated?
- Are the benefits of weight loss greater than the risk of getting gallstones?

It is estimated that digestive diseases affect 60 to 70 million people in the United States. Gallbladder disease is one of the more common of these diseases.

## What are gallstones?

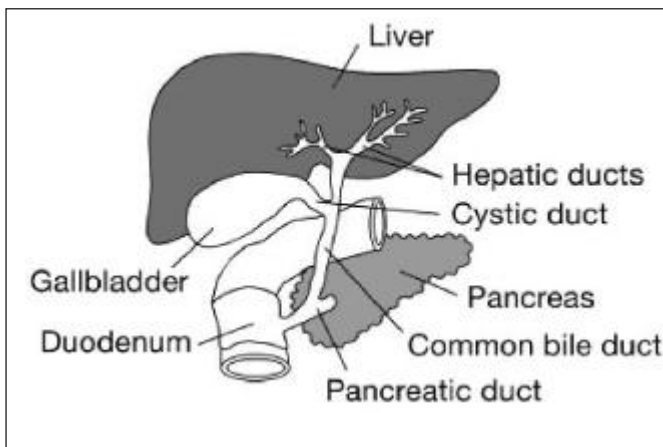
Gallstones are clusters of solid material that form in the gallbladder. The most common type is made mostly of cholesterol.

Gallstones may occur as one large stone or as many small ones. They vary in size and may be as large as a golf ball or as small as a grain of sand.

## What causes gallstones to develop?

Gallstones develop in the gallbladder, a small pear-shaped organ located beneath the liver on the right side of the abdomen. The gallbladder is about 3 inches long and 1 inch wide at its thickest part. It stores and releases bile into the intestine to help digestion.

Bile is a liquid made by the liver. It contains water, cholesterol, bile salts, fats, proteins, and bilirubin (a bile pigment). During digestion, the gallbladder contracts to release bile into the intestine, where the bile salts help to break down fat. Bile also dissolves excess cholesterol.



According to researchers, cholesterol gallstones may form in several ways, such as:

- When bile contains more cholesterol than it can dissolve.
- When there is too much bilirubin or other substance in the bile that causes cholesterol to form hard crystals.

- When there are not enough bile salts to break down fat.
- When the gallbladder does not contract and empty its bile regularly.

## What are the symptoms of gallstones?

Some common symptoms of gallstones or gallstone attack include:

- Severe pain in the upper abdomen that starts suddenly and lasts from 30 minutes to many hours.
- Pain under the right shoulder or in the right shoulder blade.
- Nausea or vomiting.
- Indigestion after eating high-fat foods, such as fried foods or desserts

## Is obesity a risk factor for gallstones?

Obesity is a strong risk factor for gallstones, especially among women. People who are obese are more likely to have gallstones than people who are at a healthy weight. Obesity in adults can be defined using the body mass index (BMI), a tool that measures weight in relation to height. The table on page 3 shows how the BMI calculation works. A BMI of 18.5 to 24.9 refers to a healthy weight, a BMI of 25 to 29.9 refers to overweight, and a BMI of 30 or higher refers to obesity.

As BMI increases, the risk for developing gallstones also rises. Studies have shown that risk may triple in women who have a BMI greater than 32 compared to those with a BMI of 24 to 25. The risk may be seven times higher in women with a BMI above 45 than in those with a BMI below 24.

Researchers have found that people who are obese may produce high levels of cholesterol. This leads to the production of bile containing more cholesterol than it can dissolve. When

this happens, gallstones can form. People who are obese may also have large gallbladders that do not empty normally or completely. Some studies have shown that men and women who carry fat around their midsections may be at a greater risk for developing gallstones than those who carry fat around their hips and thighs.

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.

### Is weight-loss dieting a risk factor for gallstones?

Weight-loss dieting increases the risk of developing gallstones. People who lose a large amount of weight quickly are at greater risk than those who lose weight at a slower pace. Rapid weight loss may also cause silent gallstones (painless gallstones) to become symptomatic. Studies have shown that people who lose more than 3 pounds per week may have a greater risk of developing gallstones than those who lose weight at slower rates.

People who are overweight are more likely to develop gallstones than people who are at a healthy weight. The risk for developing gallstones also increases with quick weight loss or a large weight loss. Gradual weight loss can lower the risk for obesity-related gallstones.

A very low-calorie diet (VLCD) allows a person who is obese to quickly lose a large amount of weight. VLCDs usually provide about 800 calories per day in food or liquid form, and are followed for 12 to 16 weeks under the supervision of a health care professional. Studies have shown that 10 to 25 percent of people on a VLCD developed gallstones. These gallstones were usually silent—they did not produce any symptoms. About one-third of the dieters who developed gallstones, however, did have symptoms and some of these required gallbladder surgery.

Experts believe weight-loss dieting may cause a shift in the balance of bile salts and cholesterol in the gallbladder. The cholesterol level is increased and the amount of bile salts is decreased. Following a diet too low in fat or going for long periods without eating (skipping breakfast, for example), a common practice among dieters, may also decrease gallbladder contractions. If the gallbladder does not contract often enough to empty out the bile, gallstones may form.

A drug called ursodiol that helps dissolve cholesterol in the bile may help prevent gallstones from developing during rapid weight loss. While ursodiol is not approved by the U.S. Food and Drug Administration (FDA) to prevent gallstones, its “off-label” use (the practice of prescribing medications for periods of time or for conditions not FDA-approved) has been shown to be effective and safe. If rapid weight loss is highly likely, you should consider talking with your health care provider about using ursodiol.

### Is weight cycling a risk factor for gallstones?

Weight cycling, or losing and regaining weight repeatedly, may increase the risk of

developing gallstones. People who weight cycle—especially with losses and gains of more than 10 pounds—have a higher risk for gallstones than people who lose weight and maintain their weight loss. Additionally, the more weight a person loses and regains during a cycle, the greater the risk of developing gallstones.

Why weight cycling is a risk factor for gallstones is unclear. The rise in cholesterol levels during the weight-loss phase of a weight cycle may be responsible. It is also thought that each cycle increases one’s risk for gallstones. However, further research is required to determine the exact link between weight loss and the risk for gallstones.

### Is surgery to treat obesity a risk factor for gallstones?

Gallstones are common among people who undergo bariatric surgery to lose weight. Bariatric surgery to reduce the size of the stomach or bypass parts of the digestive system is a weight-loss method for people who have a BMI above 40. This procedure is also an option for people who have a BMI above 35 with comorbid conditions such as diabetes and high blood pressure. Experts estimate that about one-third of patients who have bariatric surgery develop gallstones. The gallstones usually develop in the first few months after surgery and are symptomatic.

### How can I safely lose weight and decrease the risk of gallstones?

You can take several measures to decrease the risk of developing gallstones during weight loss. Losing weight gradually, instead of losing a large amount of weight quickly, lowers your risk. Depending on your starting weight, experts recommend losing weight at

the rate of 1/2 to 2 pounds per week. Losing weight at this rate commonly occurs for up to 6 months. After 6 months, weight loss usually declines and weight stabilizes because individuals in lower weight groups use fewer calories (energy). You can also decrease the risk of gallstones associated with weight cycling by aiming for a modest weight loss that you can maintain. Even a loss of 5 to 10 percent of body weight over a period of 6 months or more can improve the health of an adult who is overweight or obese.

Your food choices can also affect your gallstone risk. Experts recommend including some fat in your diet to stimulate gallbladder contracting and emptying. Current recommendations indicate that 20 to 35 percent of your total calories should come from fat. Studies have also shown that diets high in fiber and calcium may reduce the risk of gallstone development.

Finally, regular physical activity is related to a lower risk for gallstones. Aim for approximately 60 minutes of moderate- to vigorous-intensity activity on most days of the week to manage your body weight and prevent unhealthy weight gain. To sustain weight loss, engage in at least 60 to 90 minutes of daily moderate-intensity physical activity.

### What is the treatment for gallstones?

Silent gallstones are usually left alone and sometimes disappear on their own. Symptomatic gallstones are usually treated. The most common treatment is surgery to remove the gallbladder. This operation is called a *cholecystectomy*. In other cases, nonsurgical approaches—drugs—are used to dissolve the gallstones. Your health care professional can help determine which option is best for you.

### Are the benefits of weight loss greater than the risk of getting gallstones?

Although weight loss increases the risk of developing gallstones, obesity poses an even greater risk. In addition to gallstones, obesity is linked to many serious health problems, including:

- type 2 diabetes
- high blood pressure
- heart disease
- stroke
- certain types of cancer
- sleep apnea (when breathing stops for short periods during sleep)
- osteoarthritis (wearing away of the joints)
- fatty liver disease

For people who are obese, weight loss can lower the risk of developing some of these illnesses. Even a small weight loss of 10 percent of body weight over a period of 6 months can improve health and lower disease risk. In addition, weight loss may bring other benefits such as better mood, increased energy, and positive self-image.

If you are thinking about starting an eating and physical activity plan to lose weight, talk with your health care professional first. Together, you can discuss various eating and physical activity programs, your medical history, and the benefits and risks of losing weight, including the risk of developing gallstones.

## Weight-control Information Network

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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 reviewed by both NIDDK scientists and outside experts. This publication was also reviewed by Jay Everhart, M.D., M.P.H., Chief, Epidemiology and Clinical Trials Branch, NIDDK; Van S. Hubbard, M.D., Ph.D., CAPT, USPHS, Director, Division of Nutrition Research Coordination, NIH; and Susan Z. Yanovski, M.D., Director, Obesity and Eating Disorders Program and Co-Director, Office of Obesity Research, NIDDK.

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

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## Additional Reading

*Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: The Evidence Report.* September 1998. This National Heart, Lung, and Blood Institute report targets primary care practitioners and provides evidence for the effects of treatment on overweight and obesity.

*Finding Your Way to a Healthier You: Based on the "Dietary Guidelines for Americans."* This brochure from the U.S. Department of Health and Human Services (DHHS) and the U.S. Department of Agriculture provides basic guidelines for eating a healthy diet and being physically active.

*Gallstones.* This fact sheet provides basic information about gallstones and treatment options. Published by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and available through the National Digestive Diseases Information Clearinghouse, 2 Information Way, Bethesda, MD, 20892-3570, Tel: 1-800-891-5389.

*Bariatric Surgery for Severe Obesity.* This fact sheet provides basic information about bariatric surgery, including benefits and risks. Published by NIDDK and available through the Weight-control Information Network (WIN), 1 WIN Way, Bethesda, MD, 20892-3665, Tel: 1-877-946-4627.

*Prescription Medications for the Treatment of Obesity.* Information, including potential benefits and side-effects of current Food and Drug Administration-approved prescription weight-loss medications, is provided in this fact sheet. Published by NIDDK and available through WIN.

*Weight Cycling.* This fact sheet provides general information about weight cycling and associated health risks. Published by NIDDK and available through WIN.

*Weight Loss for Life.* Information about healthful weight loss as well as weight-loss program options is provided in this brochure. Published by NIDDK and available through WIN.

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