



Patient education: Gallstones (Beyond the Basics)

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GALLSTONES OVERVIEW

Gallstones are solid, pebble-like concretions that abnormally form inside the gallbladder. The gallbladder is located in the upper right abdomen, under the liver, just below or just behind the lower margin of the right side of the rib cage ([figure 1](#)).

More than one million Americans are diagnosed with gallstones (cholelithiasis) every year, joining about 38 million who already have the disorder. Fortunately, most people with gallstones do not have symptoms and do not require treatment. In some cases, however, gallstones cause pain or other complications and must be treated, usually by removing the entire gallbladder with its stones.

More detailed information about gallstones is available by subscription. (See "[Approach to the management of gallstones](#)" and "[Clinical manifestations and evaluation of gallstone disease in adults](#)" and "[Treatment of acute calculous cholecystitis](#)" and "[Overview of nonsurgical management of gallbladder stones](#)".)

THE GALLBLADDER

The gallbladder is a pear-shaped sac-like organ with a muscular wall that is about three to six inches (7.5 to 15 cm) long, located in the right upper side of the abdomen, under the liver ([figure 1](#)). It is connected to the liver and intestine through small tubes called bile ducts.

The primary purpose of the gallbladder is to store and concentrate bile, a greenish-brown fluid that is produced by the liver. Bile carries waste products out of the liver, but it is also needed to digest and absorb fatty foods, and to absorb important fat-soluble vitamins. Between meals, the gallbladder is relaxed, allowing bile to flow into it, to get stored and concentrated ([figure 1](#)). With meals, the fat contained in foods is sensed by the small intestine, causing the gallbladder to contract (squeeze) and partially empty into the intestine. A few hours later, the gallbladder relaxes and begins to store bile again.

WHAT ARE GALLSTONES?

Gallstones are solid concretions that form inside the gallbladder. Gallstones may be as small as tiny specks or as large as the gallbladder itself. The vast majority, however, are smaller than one inch (2.5 cm) and are one of two major types, cholesterol or pigment. Gallstone type is important since cholesterol stones are more likely to respond to non-surgical treatments than pigment stones.

- Cholesterol gallstones ([picture 1](#)) account for approximately 80 percent of gallstones in developed countries, including the United States.
 - Pigment stones account for about 20 percent of gallstones.
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RISK FACTORS FOR GALLSTONES

Experts do not know for sure why gallstones develop. However, many people have bile with an abnormally high concentration of cholesterol and/or calcium from which stones may develop. There are a number of factors that increase the risk of developing gallstones

- Sex – Gallstones are more common in women.
- Age – The risk of gallstones increases with age. The condition is extremely rare in children and becomes progressively more frequent over time, especially after the age of 40 years.
- Family history and genetics – Gallstones are more common in certain families, suggesting that genetics has a role in gallstone development.
- Other factors – Other conditions can increase the risk of developing gallstones, including:
 - Pregnancy
 - Use of medicines that contain estrogen (such as birth control pills)

- Obesity
 - Frequent fasting
 - Rapid weight loss (including patients who have surgical weight loss treatments)
 - Lack of physical activity
 - Diabetes mellitus
 - Sickle cell disease (and other conditions associated with rapid destruction of red blood cells, such as in patients with mechanical heart valves)
 - Cirrhosis or severe scarring of the liver
 - Certain medicines
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GALLSTONE SYMPTOMS

Silent gallstones — The majority of people who have gallstones do not have symptoms; their stones remain "silent." Silent gallstones are often found on an ultrasound or CT scan done for other reasons. Silent stones do not need to be treated since the initial symptoms of gallstones are usually mild and do not outweigh the risks involved in removing the gallbladder.

If you have silent gallstones, you should be aware of the initial symptoms of gallstone disease because you may need treatment if you develop symptoms (see ['Biliary colic'](#) below). (See ["Approach to the management of gallstones"](#).)

Biliary colic — Biliary colic, also known as gallstone pain or biliary pain, is the most common initial symptom of gallstones. It manifests as attacks of abdominal pain, often located in the right upper belly just under the lower ribs. Sometimes it is felt in the upper center of the abdomen or even in the lower chest, causing it to be confused with angina or a heart attack. You may also feel nausea, vomiting, and pain in the right shoulder or back.

Biliary colic usually happens when the gallbladder that contains stones contracts in response to a fatty meal. This compresses the stones against the gallbladder outlet, blocking its opening. As the gallbladder relaxes several hours after the meal, the pain subsides. In some people, the pain happens without having eaten anything and many times it starts around or after midnight.

Once you have a first attack of biliary colic, there is a good chance you will have more symptoms in the future. Such recurrent symptoms are usually more severe and occasionally associated with complications.

Complications of gallstones

Acute cholecystitis — This refers to inflammation of the gallbladder. It happens when there is a complete blockage of the gallbladder, caused by a gallstone. Unlike biliary colic, which resolves within a few hours, pain is constant with acute cholecystitis and fever is common.

Acute cholecystitis is a serious condition that requires immediate medical treatment in the hospital. Treatment includes IV fluids, pain medicine, and usually antibiotics. Surgery to remove the gallbladder along with its contained stones is usually recommended during the hospitalization or shortly thereafter. If not treated, acute cholecystitis can lead to gallbladder rupture, a life-threatening condition. (See "[Treatment of acute calculous cholecystitis](#)".)

Choledocholithiasis — This complication can develop if one or more gallstones leave the gallbladder to the main bile ducts and block the area where bile exits into the intestine. It may lead to:

- Jaundice, which is a yellow discoloration of the skin and eyes.
- Acute cholangitis, which is an infection of the bile ducts that causes pain, chills, and fever. This is a life-threatening condition that requires prompt treatment, usually involving removal of the blocking gallstone with a non-surgical procedure known as endoscopic retrograde cholangiopancreatography, or ERCP. (See "[Patient education: ERCP \(endoscopic retrograde cholangiopancreatography\) \(Beyond the Basics\)](#)".)
- Acute pancreatitis, which is sudden inflammation of the pancreas, leading to severe abdominal pain. (See "[Patient education: Acute pancreatitis \(Beyond the Basics\)](#)".)

GALLSTONE DIAGNOSIS

There are two parts to diagnosing gallstones: determining if gallstones are present and determining if gallstones are the cause of the symptoms.

Gallstones are usually found using ultrasound imaging, a painless test that uses sound waves to create an image of the gallbladder. An ultrasound is the most sensitive test with which to find gallbladder stones, but gallstones can also be detected on other imaging tests.

Having gallstones does not mean that the gallstones are the cause of your symptoms. Thus, other tests may be recommended if there is doubt about the relationship of the gallstones to your symptoms.

GALLSTONE TREATMENT

There are three general options for people with gallstones; the best option depends upon your individual situation.

- Expectant management: Do nothing, wait and watch
- Surgical therapy: Remove the gallbladder and stones
- Non-surgical therapy: Eliminate the stones while preserving the gallbladder

Surgical treatment

Cholecystectomy — Cholecystectomy is a surgery that removes the gallbladder. It is one of the most commonly performed surgeries in the United States. The surgery is done in an operating room after you are given anesthesia.

The gallbladder is an important organ, but you can live without it. Removing the gallbladder does not usually cause long-term problems or serious complications. However, about one-half of people who have their gallbladder removed develop looser stools, gas, and bloating; in most people these symptoms are mild, do not require treatment, and improve with time.

Surgery may be done through an open incision (cut) in the skin and abdominal wall. However, in most people, the surgery is done using small instruments and a video camera, which are inserted into the abdomen through several small puncture holes in lieu of the larger cut. This is called laparoscopic cholecystectomy.

Non-surgical treatments — Nonsurgical treatments are available for some people with gallstones, mainly those who cannot undergo cholecystectomy. These treatments get rid of the gallstones while preserving the gallbladder. The main disadvantage is that the stones may come back over time. (See "[Overview of nonsurgical management of gallbladder stones](#)".)

Bile acid pill — A bile acid pill ([ursodeoxycholic acid](#) or ursodiol) is a medicine that can dissolve cholesterol-type gallstones. About two-thirds of people who take it become symptom free within two to three months after starting treatment. However, it may take several years for the stones to disappear completely. The treatment is safe and well tolerated. In some people it can cause mild temporary diarrhea.

Because of its slow action, bile acid treatment is not practical in people who are having acute recurrent gallstone symptoms. Bile acid treatments are most effective for people with small cholesterol stones and a functioning gallbladder, which may be determined by using imaging studies. Even then, it may fail to eliminate the stones in some patients.

Extracorporeal shock wave lithotripsy — Extracorporeal shock wave lithotripsy (ESWL) is widely used for kidney stones but has fallen out of favor for the treatment of gallbladder

stones. Only a few centers worldwide continue to offer it. It uses shock waves to break gallstones into smaller fragments and "sand," which can then be dissolved more easily with the oral bile acid pill discussed earlier. It is most effective in people who have a normal body weight (not obese), fewer than three stones, and who have good gallbladder function

Since bile acid therapy is needed to clear the fractured stones and residue, lithotripsy is mostly used to treat cholesterol stones. The success of lithotripsy for gallstones varies, with experienced centers successfully treating 90 to 100 percent of people with one stone and up to 67 percent of people with two or more stones.

Percutaneous removal — When a patient at high surgical risk due to multiple medical conditions is found to have life-threatening acute cholecystitis, the patient is often treated with a temporizing percutaneous catheter drainage in lieu of the surgical removal of the gallbladder, which may not be tolerated. This is done by inserting a small plastic tube (catheter), the size of a spaghetti strand, into the gallbladder to drain and relieve the obstruction caused by the stones. In highly specialized centers, the hole through which the catheter is placed is gradually enlarged over a few weeks and the stones are extracted through the hole leaving the gallbladder behind. This procedure is not recommended for otherwise healthy gallstone patients since it requires many weeks to accomplish and the gallstones many times recur over a few years.

Gallstone recurrence — The main disadvantage of the non-surgical treatments is that gallstones can come back since the gallbladder is still in place. With bile acid treatment, stones come back in about 50 percent of people in the first five years. However, symptoms do not always come back, and retreatment is not always needed. After cholecystectomy, gallstones may recur in the bile duct in a small percentage of patients. (See "[Endoscopic management of bile duct stones](#)".)

Gallstone prevention — To try to prevent gallstones from coming back, it is recommended that you try to stay at a healthy body weight by eating an appropriate number of calories and exercising for at least 30 minutes five days per week. If you are planning a rapid weight-loss program, such as weight loss surgery, your doctor or nurse should monitor you. Bile acid pills may be recommended to prevent gallstones from developing as you lose weight.

WHERE TO GET MORE INFORMATION

Your health care provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our website (www.uptodate.com/patients). Related topics for patients, as well as selected articles written for health care professionals, are also available. Some of the most relevant are listed below.

Patient level information — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

[Patient education: Gallstones \(The Basics\)](#)

[Patient education: Choosing surgery to treat gallstones \(The Basics\)](#)

[Patient education: Gallbladder cancer \(The Basics\)](#)

[Patient education: Jaundice in adults \(The Basics\)](#)

[Patient education: HIDA scan \(The Basics\)](#)

[Patient education: Abdominal ultrasound \(The Basics\)](#)

[Patient education: Lithotripsy of bile or pancreatic duct stones \(The Basics\)](#)

[Patient education: CA 19-9 test \(The Basics\)](#)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

[Patient education: ERCP \(endoscopic retrograde cholangiopancreatography\) \(Beyond the Basics\)](#)

[Patient education: Acute pancreatitis \(Beyond the Basics\)](#)

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

[Approach to the management of gallstones](#)

[Acute calculous cholecystitis: Clinical features and diagnosis](#)

[Endoscopic management of bile duct stones](#)

[Gallstones: Epidemiology, risk factors and prevention](#)

[Epidemiology, risk factors, clinical features, and diagnosis of gallbladder cancer](#)

[Overview of nonsurgical management of gallbladder stones](#)

[Treatment of acute calculous cholecystitis](#)

Clinical manifestations and evaluation of gallstone disease in adults

The following organizations also provide reliable health information.

- National Library of Medicine
(www.nlm.nih.gov/medlineplus/ency/article/000273.htm, available in Spanish)
- National Institutes Diabetes and Digestive and Kidney Diseases
(<https://www.niddk.nih.gov/health-information/digestive-diseases/gallstones>)

[1,2]

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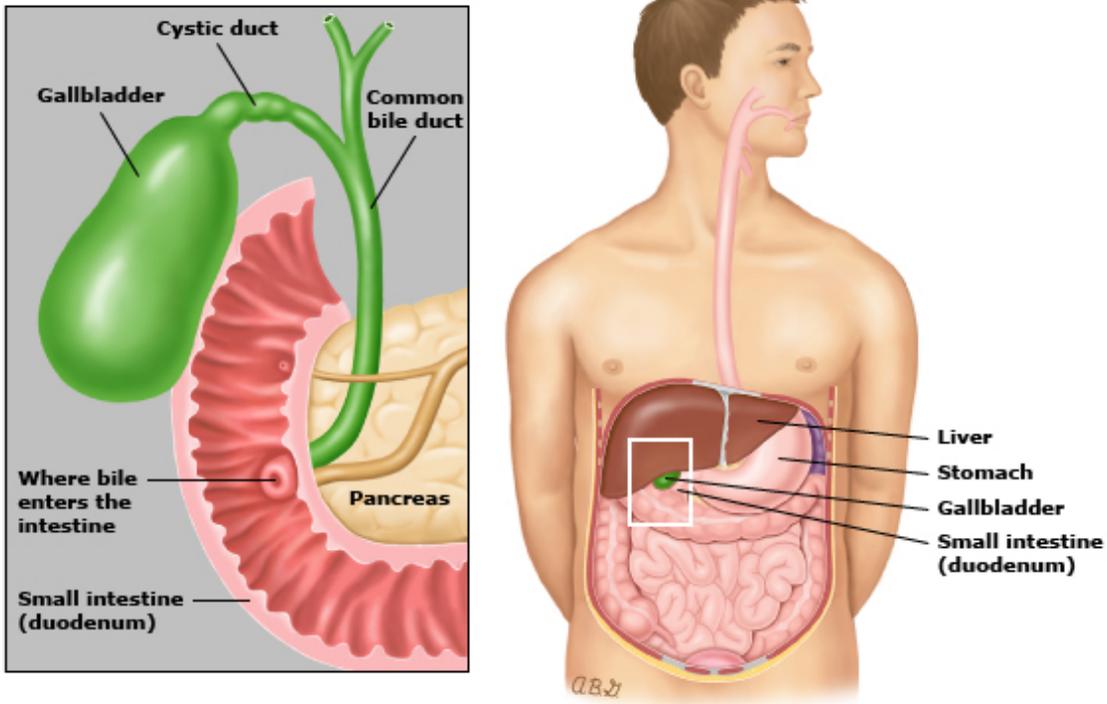
REFERENCES

1. Ahmed A, Cheung RC, Keeffe EB. Management of gallstones and their complications. *Am Fam Physician* 2000; 61:1673.
2. Darzi A, Geraghty JG, Williams NN, et al. The pros and cons of laparoscopic cholecystectomy and extracorporeal shock wave lithotripsy in the management of gallstone disease. *Ann R Coll Surg Engl* 1994; 76:42.

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GRAPHICS

Figure 1: Anatomy of the gallbladder



The gallbladder (shown in green) is a small, pear-shaped organ that is tucked under the liver. It stores bile, a fluid that is made in the liver and helps the body break down fat. When you eat a meal that has fat in it, your gallbladder empties the bile into a tube called the "bile duct." The bile duct carries the bile into the small intestine to help with digestion.

Picture 1: Gallstones



Gallstones retrieved from six different patients. Note how gallstones are similar in the same patient but differ among patients.

(A-D) Cholesterol stones.

(E) Brown pigment stones.

(F) Black pigment stones.

Courtesy of Salam F Zakko, MD, FACP, AGAF.

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