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## Health Information Sheet

### Gallbladder Surgery

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## What is Gallbladder Surgery?

Surgery to remove the gallbladder is overwhelmingly the standard treatment for dealing with gallstones and other problems of this small organ. The procedure is often referred to by the technical name *cholecystectomy* (from the Greek words for gall, bladder and excision).

Located adjacent to the liver, the gallbladder's function is to store bile, a fluid secreted by the liver to aid in digestion of fat. A small pear-shaped sac, the gallbladder works by contracting after you've eaten to empty bile into your small intestine. While it has the role of storing bile, the gallbladder's removal has minimal effect on patients' subsequent digestive function, since the bile then is channeled from the liver directly into the small intestine.

By far the most common problem affecting the gallbladder is the development of gallstones, hard, often-round objects formed of

cholesterol and other substances that can cause symptoms ranging from indigestion to severe pain. Problems affecting the gallbladder include inflammation and, potentially, calcification. Often, the complications resulting from gallstones come about when the stones lodge in the ducts that lead from the gallbladder and the liver. If not treated, complications from gallstones such as pancreatitis can become serious and even fatal.

While surgery to remove the gallbladder relied for many years on open procedures in which the surgeon made a large incision to gain direct access to the gallbladder, today most cholecystectomies require only several tiny incisions. The procedure is performed with laparoscopic instruments, fiberoptic tubes fitted with videocameras. The staff of Connecticut Surgical Group has pioneered in techniques of laparoscopic surgery and has a strong record of excellent outcomes.

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## How common are gallbladder problems?

About one in 10 people are estimated to develop gallstones, many of them without having any symptoms or problems whatever, and without needing treatment.

But approximately one in five people who have gallstones do experience symptoms, whether chronic indigestion, sudden attacks of moderate-to-severe pain with nausea or vomiting.

With more than 500,000 cholecystectomies performed annually, surgery to remove gallstones is one of the most frequently performed operations in the United States.

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## What does the gallbladder do?

Among the liver's multiple functions is the production of bile, a greenish-brown fluid made up of water, cholesterol, bile salts, proteins and the bile pigment bilirubin that aids in digestion of fat. Secreted by the liver in a diluted form, bile moves through small tubes called the hepatic and cystic ducts to the gallbladder, where it is stored and concentrated.

A three to-four-inch-long, dark-green, pear-shaped sac, the gallbladder works by contracting after you've eaten to empty bile into your small intestine by way of the common bile duct. Bile helps alkalize the contents of the intestine and dissolve the products of fat digestion.

The liver is located toward the right side of the abdominal cavity, and the gallbladder is located next to it on its underside. The gallbladder and the ducts associated with it that carry bile and other substances to the small intestine are referred to as the biliary system. The hepatic duct leading from the liver and the cystic duct leading from the gallbladder join to form the common bile duct, which leads to the small intestine. Several other ducts,

including one from the pancreas, also open into the common bile duct.

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## What are gallstones?

Gallstones are accretions of the substances in bile that crystallize into hard stones when the bile's chemical makeup becomes out of balance, or when bile is not completely emptied from the gallbladder and becomes concentrated within the sac.

Gallstones can be as small as a grain of sand and as large as a golf ball. They can be round or irregular in shape, and smooth or with edges. Patients can experience just one stone or many, even into the hundreds.

There are two basic types of gallstones.

- **Cholesterol gallstones** — About 80 percent of gallstones are formed of crystallized cholesterol, although often with some degree of bile salts and bilirubin mixed in. These yellow-green cholesterol stones are believed to be the result of more cholesterol than can be dissolved, too much bilirubin or insufficient bile salts.
- **Pigment gallstones** — Pigment stones are small, dark stones made up of the bile pigment bilirubin, and formed when the bile contains too much bilirubin. Although it's not clear what causes them to form, they are more likely to develop in people with problems such as biliary tract infections and cirrhosis.

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## What are duct stones?

Stones found in the biliary system ducts can be either stones from the gallbladder that have lodged in the ducts or stones that have developed in the ducts themselves. In the latter case, they are likely to be soft and made of decomposed bile.

Stones that lodge in the ducts can block the flow of bile out of the gallbladder, resulting in *biliary colic*, attacks of pain that occur periodically and are experienced as steady, dull aches that last from 15 minutes to several hours. And, gallstone problems can lead to inflammation of the gallbladder, creating nausea and more extended pain.

Inflammation of the ducts or liver is also possible, but less likely. Also possible is a blockage of the pancreatic duct, which opens onto the common bile ducts in the course of carrying digestive enzymes from the pancreas to the small intestine. A gallstone blockage of the pancreatic duct can trap enzymes in the pancreas

and cause the painful inflammation known as gallstone pancreatitis.

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## What is inflammation of the gallbladder?

Inflammation of the gallbladder, the most common problem associated with the presence of gallstones, results when stones lodge in the cystic duct and block the flow of bile out of the gallbladder. Referred to by the technical name *cholecystitis*, inflammation can result in extended abdominal pain, nausea, vomiting and fever. If the problem becomes chronic, that is, continues indefinitely, the wall of the gallbladder can become thick, stiff and even calcified.

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## What are the symptoms of gallbladder problems?

The good news is that the great preponderance of people who have gallstones don't have any symptoms at all, and don't require treatment. Once symptoms develop, they're likely to continue to appear, although it may be worth waiting after the first attack to see if they come back before making major treatment decisions.

- For those who have symptoms, the most common one is periodic attacks of moderate-to-severe cramping-like pain in the upper abdomen that can last from 15 minutes to several hours. During an attack, the pain is usually a steady, dull ache. You may also experience pain in the back between the shoulder blades or under the right shoulder. Nausea and vomiting may also be present during these attacks.

The pain attacks may occur after meals — especially meals with a high fat content — and may occur at night.

Other symptoms may include chronic indigestion, abdominal bloating, gas and belching. It's important to keep in mind that these symptoms often result from other problems, as well.

- Nausea, vomiting, fever and extended moderate-to-severe pain throughout your abdomen may be signs of inflammation of the gallbladder.
- Yellowing of your skin and the whites of your eyes, clay-colored stools, and sweating, chills and fever may also be present due to a duct blockage.

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## What are the risk factors for gallbladder problems?

Some factors that represent an increased risk of developing gallstones are out of our control, including gender, ethnicity and age.

- Women between 20 and 60 years of age are twice as likely to develop gallstones as men, reflecting the fact that the female hormone estrogen increases the level of cholesterol contained in bile. Similar factors that increase estrogen and therefore the level of cholesterol in bile are pregnancy, birth control pills and hormone replacement therapy.
- Family history seems to play since, gallbladder problems tend to run in families.
- Native Americans have the highest rate of gallstones in the United States, with more than half of Native American men having them by age 60. Mexican Americans of both sexes have higher rates than the population as a whole.
- As you grow older your chances of developing gallstones increases, with more than 10 percent of men and 25 percent of women likely to have them by age 70.
- Diabetes often have high levels of triglycerides, fatty acids that increase the risk of developing gallstones.

Factors we can control that contribute to the likelihood of developing gallstones include obesity and, perhaps paradoxically, rapid weight loss.

- Being highly overweight is believed to cause a reduction in the amount of bile salts in bile, resulting in an increased level of cholesterol. Obesity is also believed to result in incomplete emptying of the gallbladder.
- On the other hand, losing weight rapidly by dramatically reducing food intake also causes the liver to secrete extra cholesterol into bile. Fasting slows down gallbladder movement, causing the bile to become over concentrated with cholesterol.

You should know that the cholesterol in bile is not related to the bile found in the bloodstream, and isn't lowered by medications to reduce blood cholesterol. In fact, drugs to lower cholesterol in the bloodstream can also be a factor in increasing the risk of gallstones, since they can result in an increase in the amount of cholesterol found in bile.

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## How are gallbladder problems diagnosed?

Since the great preponderance of people who have gallstones also have no symptoms or problems related to them, it's actually not unusual for stones to be detected by accident during tests for

other issues — such as fetal ultrasound scans on pregnant women. Again, if the gallstones are not causing any symptoms or problems, treatment is not necessary.

When symptoms are a problem, your doctor will first review your medical history and conduct a physical examination, checking for jaundice and abdominal tenderness. He or she may order blood tests to check enzyme and bilirubin levels.

Also very likely to be ordered is an abdominal ultrasound exam, using sound waves processed by a computer to generate images of internal structures. As sound waves bounce off internal organs, they also will image any gallstones that are present. Ultrasound is considered a highly accurate system for detecting gallstones.

Diagnostic radiology tests that may be ordered include CT scanning (the use of computer-processed x-rays to obtain finely detailed images), cholangiography (in which a medical dye is introduced to identify duct blockages) and cholescintigraphy (the use of a radioactive isotope to visualize the gallbladder's ability to contract).

Another procedure is called endoscopic retrograde cholangiopancreatography (ERCP), using a long flexible fiberoptic endoscope introduced through the esophagus, stomach and small intestine to enable the doctor to approach and visualize the biliary system. It may be possible for the doctor to use a small basket inserted through the endoscope to capture and remove any stones in the ducts.

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## How is surgery for gallbladder problems performed?

Surgical removal is the most-frequently recommended treatment for gallstones that cause symptoms. While medical treatments for gallstones do exist, they have drawbacks and are rarely used. And while the gallbladder does have a role in the human digestive system, its removal does not significantly affect the continued digestive function. As a result, with more than 500,000 cholecystectomies performed each year, it is one of the most frequently done surgical procedures in the United States.

The traditional approach to cholecystectomy for many years was an open procedure in which the surgeon made a large incision to gain direct access to the gallbladder. However, gallbladder surgery today is much more likely to involve laparoscopic techniques in which the surgeon uses fiberoptic tubes to access the abdominal cavity through several tiny incisions. The results of this surgery with minimal incisions are much faster recovery time with much less pain.

To perform a laparoscopic procedure, the surgeon makes four one-quarter- to one-half-inch incisions in the abdomen for insertion of the laparoscopes, which include a video camera with a bright light and surgical instruments to hold, excise and remove the

gallbladder. To give the surgeon room to see and maneuver, the abdomen is inflated with carbon dioxide gas. Since this can be uncomfortable for the patient, the procedure is performed under general anesthesia. Usually, laparoscopic cholecystectomy is performed as outpatient or day-surgery or with a one- or two-day stay in the hospital. Recovery usually involves less than one week.

It's important to note that some cases may not be appropriate for laparoscopic surgery, and in any laparoscopic case the surgeon may find it necessary to change to an open incision approach in the event any difficulties are encountered laparoscopically.

An open incision approach may be needed in the case of such issues as scar tissue from previous operations or inflammation of the gallbladder, ducts or lining of the abdominal cavity. The operation involves a five- to eight-inch incision in the abdomen. Hospitalization from open incision gallbladder surgery usually requires several days of hospitalization and three to four weeks recovery time.

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## **What are possible complications from removal of the gallbladder?**

Although the gallbladder does serve a purpose in the digestive process, its removal very rarely has any effect on the digestive system afterwards. Instead of being stored in the gallbladder, bile flows directly from the liver to the small intestine by means of the hepatic and common bile ducts. This does mean it flows more steadily than before, and this may cause more frequent, less solid-bowel movements (sometimes diarrhea) in about one percent of gallbladder surgery patients. If this becomes a problem, usually it can be dealt with by diet modifications such as eating more fiber and avoiding spicy foods, fats and dairy products.

You should also keep in mind that gallbladder removal is a surgical procedure and every medical professional will tell you that any operation carries with it very small-but-possible risks of complications such as injury to other organs, allergic reactions to anesthesia, bleeding and infection.

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## **What other treatments are there for gallbladder problems?**

Surgery is overwhelmingly the recommended treatment for gallbladder problems. In cases where surgery may not be an option, such as medical issues that prevent it, there is a medical treatment that uses bile salt tablets to dissolve cholesterol stones over an extended period of time.

Medications used for this tend to be expensive, work best on small cholesterol stones and take months or even years of treatment. Moreover, the cure is not permanent; stones often recur in a

matter of years. To prevent them, you would have to take the medication indefinitely.

Another nonsurgical treatment sometimes used is extracorporeal shock-wave lithotripsy, the acoustic shock-wave technique developed to treat kidney stones with good results. For gallstone cases, it's best suited for small, single stones. And again, the cure is not permanent.

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## What can I do to prevent gallbladder problems?

While there's no guaranteed way to prevent gallstones, you can help to lower your risk of developing them with some lifestyle changes.

These include:

- Keep your weight at a healthy level. Obesity is a major risk factor for development of gallstones, since your body produces increased levels of bile cholesterol. On the other hand, crash dieting also increases bile cholesterol, and so does yo-yo dieting — repeatedly losing weight and regaining it. Seek to lose weight slowly and steadily over time.
- Eat a healthy diet, one that is bland, low in fat and high in fiber. This suggests more vegetables, fresh fruits and whole grains and less red meat, fast foods and butter or margarine, among other things. For guidelines for a low-fat diet, [click here](#).
- Exercise. Regularly. At least 30 minutes a day or two to three hours a week. It will help you lose weight and decrease your levels of cholesterol and triglycerides.

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## For Additional Information

You can find much additional information about gallbladder problems at web sites sponsored by government agencies, societies and healthcare institutions. It should perhaps be noted that the World Wide Web is open to many sources posting questionable information and promises, and you are encouraged to seek information from established, reputable organizations.

### Likely sources include:

The National Digestive Diseases Information Clearinghouse ([www.niddk.nih.gov](http://www.niddk.nih.gov))

The American College of Surgeons ([www.facs.org](http://www.facs.org))

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