

## What is the Gallbladder?

The gallbladder is a small pear-shaped hollow sac nestled beneath the liver in the right-upper abdomen. It stores about a quarter cup of a yellowish-green material called bile. Made in the liver, bile tastes bitter, and this is why the word bile has come to denote bitterness. The gallbladder is really just a side branch of the common bile duct, the main duct that drains bile from the liver into the small intestine. A duct is a hollow tube that carries fluid from one place to another, like a water pipe in your home. The side branch that connects the gallbladder to this main duct is called the cystic duct. These ducts carry the bile to the intestine. The pancreas usually shares a common drain with the liver via its pancreatic duct. When bile enters the small intestine, it breaks up large globs of fat into smaller globs, a first step in digestion. A healthy gallbladder keeps bile flowing continuously. However, when the gallbladder becomes diseased, the flow slows and bile becomes thick and forms sludge. The stagnant bile gradually crystallizes and the crystals clump together to form stones.

## Symptoms of Gallstones

About half of those with gallstones have no symptoms and need no treatment. Most of them don't even know that the stones are there. Painless stones probably float freely in the gallbladder, but others are plagued with unpleasant attacks of abdominal pain. The pain occurs when a stone is small enough to escape from the gallbladder and then become lodged in the bile ducts below. The type and severity of symptoms depend upon where the stones lodge. Called "biliary colic," gallbladder pain is felt as a sharp, severe, stabbing pain often located in the right upper abdomen. Attacks may last 15 minutes to several hours and may be separated by weeks, months, or even years. The pain often occurs after meals, particularly a high fat meal. Pain may also be felt between the shoulder blades or right shoulder and sometimes in the chest, where it is often confused with a heart attack. There may be associated symptoms of nausea, vomiting, and low grade fever. Untreated, symptomatic gallstones may damage the pancreas and liver, leading to gallstone pancreatitis and obstructive liver jaundice. Patients with symptoms must see their doctor.

## Risk Factors

While all ages and both sexes are susceptible, women are particularly vulnerable accounting for more than 75 percent of all patients. Pregnancy, birth control pills, obesity, and a high fat diet are all contributing factors. Obesity increases the risk six fold, but individuals on crash diets who lose weight too quickly are also at high risk. Gallstones affect all races, but are more prevalent in some populations. Overall about 10 percent of Americans have gallstones as compared to Sweden where 44 percent of the population is affected. In this country, the Native American Indians have the highest incidence of gallbladder disease. Interestingly, over 80 percent of the Pima Indians of southern Arizona develop gallstones by age 35.

## Diagnosis

Gallstones may occasionally be found on x-rays done for other reasons as about 10 percent are calcified and show up on routine plain x-rays. More than likely your doctor ordered additional tests based on your symptoms. Possible gallbladder tests include liver and pancreas blood tests that measure enzymes in the blood. High levels may signify damage to these organs. Most patients undergo a simple ultrasound exam of the abdomen which uses harmless high-frequency sound waves to create a picture of the gallbladder and ducts. The liver and pancreas can often be seen as well. Special cases may require a more sophisticated x-ray called ERCP. This is a procedure performed by a Gastroenterologist using a lighted "scope" that projects a video image. It can help locate stones or other blockages in the bile ducts.

## Treatment

In those patients with gallstones who have no symptoms or very mild and infrequent attacks, watchful waiting may be justified. However, for those individuals with persistent or severe symptoms, surgery to remove the gallbladder and gallstones is recommended. Taking out the stones and leaving the gallbladder behind merely invites new stone formation. For effective treatment, both must be removed. There are usually minimal to no consequences to having your gallbladder removed. About two percent of patients will develop loose stools after gallbladder removal which can be treated with diet or medication.

## Surgery

In less than a decade, a new technique called laparoscopic cholecystectomy has revolutionized gallbladder surgery. First performed in France in 1987, this simple minimally invasive technique is now possible in over 95 percent of patients. Instead of a large skin incision, a "lap chole" is performed by making three or four 1/2 inch incisions in the abdominal wall and inserting a tiny video camera to guide the operation. With special instruments, the gallbladder is separated from its attachments and removed through a small incision in the bellybutton. The patient may eat and drink within a few hours after surgery and go home the same day with only a few small band aids on his or her abdomen. There is very little pain or disfigurement. Most are able to resume full activity within a week's time. Serious complications are rare and usually surgery ends the problem. It is possible, but very rare, for gallstones to return once the gallbladder has been removed.