GALLSTONES

What Is It?

Gallstones are the most common digestive problem associated with the gallbladder. Gallstones can be solid, semi-solid or soft masses that are composed of one or more of the following: cholesterol, bile pigment (bilirubin), bile salts, inorganic minerals (usually calcium) and the phospholipid lecithin. Gallstones can range in size from as small as a grain of sand to as large as a golf ball. Very often they are the size of small pebbles. A person can have a single stone, dozens, or even hundreds of stones.

When bile production, circulation, or quality is compromised, gallstones can occur. The liver produces bile (a yellowish brown or green fluid), excretes toxins into it and then sends it to the gallbladder. It is the job of the gallbladder to hold that bile in storage until food enters the small intestine. At that time, the gallbladder should contract, sending bile through the cystic and bile ducts into the duodenum (upper portion of the small intestine). The fat in the food can be broken down or emulsified. Bile also helps increase peristalsis and retard putrefaction.

There are two major types of gallstones: cholesterol stones and pigment stones. Cholesterol gallstones make up 80 percent of gallstone cases in the U.S., while pigment gallstones make up the remaining 20 percent of cases. Cholesterol stones contain more than 70 percent cholesterol; some are pure cholesterol. Pigment stones are made up of calcium and bilirubin with a mucous protein core.

What Causes It?

A number of factors appear to contribute to gallstone formation. Primary among them are:

- Inherited body chemistry
- Body weight
- Gallbladder motility (movement)
- Diet
- Pregnancy
- Birth control use

During the normal course of digestion, about 98 percent of the bile acids that are secreted from the liver and released by the gallbladder are reabsorbed in the ileum (lower portion of the small intestine). When the ileum is impaired in its ability to reabsorb these bile acids, the bile acid pool is reduced as is the rate of bile secretion. The net result is an increased risk of developing gallstones.

When the liver produces too much cholesterol or an insufficient quantity of bile salts, then cholesterol crystals can precipitate out of solution and form cholesterol stones. Excess cholesterol in the bile can result from obesity or pregnancy, while a deficiency of bile salts can...
result from the use of bile salt binding drugs used to treat high cholesterol. A bile-salt deficiency is also found in Crohn's disease, a serious gastrointestinal disorder usually affecting the ileum.

The risk of developing gallstones during pregnancy is elevated not just because of the added body weight, but also due to increased estrogen levels. Women on birth control pills or hormone replacement therapy would therefore also be at greater risk of developing gallstones than women who were not on these therapies. Increased estrogen levels may increase cholesterol levels in the bile and decrease gallbladder movement. Additionally, exposure to some environmental chemicals, such as pesticides, affects the body the same way that excessive estrogen does, and so could conceivably play a role in gallstone formation.

Cholesterol stone formation is accelerated if gallbladder contractions are sluggish, as they tend to be when there is too much cholesterol in the bile. This can happen after a person has undergone prolonged fasting or followed a very low-calorie diet. Some cholesterol-lowering drugs can also slow gallbladder contractions causing incomplete emptying of bile. Delayed emptying of the gallbladder gives cholesterol more opportunity to crystallize into stones.

The hormone largely responsible for the contraction of the gallbladder is cholecystokinin, or CCK. CCK also triggers the pancreas to release enzymes. When fatty food enters the duodenum, CCK is released and travels to the gallbladder causing it to contract. Secretin, to a lesser extent, also triggers this contraction.

What's more, it has been shown that in patients using proton pump inhibitors, 26 percent had impaired biliary function. This could be due to a decreased amount of secretin, which is triggered by the presence of stomach acid.
The bilirubin found in pigment stones is created as part of the body’s normal functioning, resulting from the following steps:

- The spleen removes worn out red blood cells from the bloodstream.
- These red blood cells release hemoglobin, a red pigment.
- Hemoglobin is converted to the yellow pigmented bilirubin.
- Bilirubin is picked up by the liver and released into the bile.

Pigment stones can form when the body destroys too many red blood cells, a condition called hemolysis, present in hereditary blood disorders such as sickle cell anemia. Pigment stones can also result from alcoholic cirrhosis of the liver. The risk of developing pigment stones is also increased in the patient who has had intestinal surgery. Diet is less of an influence in the development of pigment stones than in cholesterol stones. It is believed that low-fiber, high-cholesterol diets (those high in animal fats) and diets high in starchy foods contribute to the formation of cholesterol stones. Over-consumption of fatty and fried foods and refined sugar, as well as inadequate intake of foods containing the vitamins E, B and C, are also factors thought to contribute to gallstone formation.

There appears to be a genetic component to gallstones, for they tend to run in families and are more common in some races than others. Parasitic infection can also play a role, for such infection can lead to a build up of calcium-based stones. Constipation is another condition that can set the stage for development of gallstones. Food allergies also appear to play a role, for allergic foods may cause swelling of the bile ducts resulting in impaired bile flow from the gallbladder. Lack of exercise can also contribute to stone formation. In fact, physical activity can reduce the risk of stone formation by 20 to 40 percent. Dehydration is another contributing factor. Adequate water intake is necessary to dilute toxins in the body.

The amount of stomach acid produced by the body seems to also play a role in gallstone formation, for stomach acid and fat stimulate the hormones that make the gallbladder contract. A deficiency in hydrochloric acid may impair gallbladder contraction and result in back up of bile.

Once gallstones have formed, they can block the flow of bile from the liver and gallbladder. At times, they can obstruct the pancreas and intestine, as well, creating medical emergencies.

Those most prone to biliary problems (problems related to bile and associated structures through which it flows, including gallstones) are people who can be described by the five F’s: fair, fat, female, fertile, and 40. Women are decidedly more prone to gallbladder formation (two to four times more likely to be affected than men), especially when pregnant, taking birth control pills or on hormone replacement therapy.

While gallstones can affect people of any age, the risk for developing them increases with age, especially as middle age approaches. It is believed that the majority of adults over 60 have gallstones, though most will be unaware of it due to lack of symptoms. While more than 20 million Americans have gallstones, about 80 percent are asymptomatic (without symptoms).

While increased levels of cholesterol in the bile can cause formation of cholesterol gallstones, it is important to know that the level of cholesterol in the bile does not correlate with the total cholesterol in the blood. There does, however, appear to be an association between increased serum triglyceride levels and less-soluble bile.

What Are the Signs and Symptoms?

Most people who have gallstones never have symptoms. Early symptoms are characterized by incomplete fat
digestion. When fat is not completely digested, bacteria in the colon act upon undigested portions of it, resulting in:

- Gas
- Fatty stools that float
- Foul-smelling stools
- Abdominal distention and bloating
- Chronic belching

Once the stone begins to form, its radius increases at an average rate of 2.6 mm per year, eventually reaching a size of a few millimeters to more than a centimeter. Symptoms occur an average of eight years after formation of the stone begins. The presence of stones creates a possibility that inflammation of the gallbladder (cholecystitis) may develop as a result of stones lodging in the cystic duct (connecting the gallbladder to the common bile duct which empties into the duodenum causing a backflow of bile). Serious symptoms may occur when stones become large enough to obstruct bile ducts. These may include:

- Pain in the upper right abdomen (may radiate to the right shoulder, to the back or to the area under the sternum and mimic a heart attack), especially after a fried or fatty meal

Did You Know

- Gallstones are very common. Over one million people are diagnosed each year. They occur in one out of five women by age 60, and they are half as common in men.
- Gallstones occur more commonly in older people and in people who are overweight or who lose weight suddenly.
- They also occur more frequently in women who have been exposed to higher amounts of the hormone estrogen over their lifetime by having multiple pregnancies, by taking birth-control pills or by taking hormone replacement after menopause.
- More than 80 percent of people with gallstones have no symptoms, and do not require treatment.
- Even when gallstone attacks subside on their own, the symptoms will return within a year 50 percent of the time.

An ultrasound procedure to detect gallstones

- Nausea and vomiting
- Malaise (feeling bad all over)
- Loss of appetite
- Constant itching (the result of bile salts entering the bloodstream)
- Chills, fever (due to infection)
- Jaundice (yellow coloration of skin and whites of the eyes)
- Brown or bright yellow urine
- Light or clay-colored stools
- Shaking
- Food intolerances
- Fatigue
- Headaches
- Anxiety, irritability

Attacks of gallbladder pain can last anywhere from 20 minutes to several hours. Pain that occurs when a gallstone blocks the flow of bile from the gallbladder is referred to as biliary colic. Prolonged blockage of bile ducts can cause severe damage to the gallbladder, liver or pancreas and may even be fatal.
**How Is It Diagnosed?**

Those called “silent” gallstones (those causing no symptoms) are often detected during a diagnostic work up that is done for unrelated reasons. Gallstones may appear on an abdominal X-ray, CT scan, MRI scan or abdominal ultrasound. Ultrasound is the diagnostic tool most frequently used to rule out gallstones when they are suspected. Ultrasound (or pulse-echo sonography) is a non-invasive, painless procedure that involves passing a probe externally over the abdomen. Sound waves are introduced into the body through this probe. If gallstones are present, the waves will bounce off them, revealing their location via an image that appears on a monitor. Other benefits of ultrasound are that it can show gallbladder distension (swelling) and thickness of the gallbladder wall as well as inflammation. Ultrasound will also help detect liver cysts, tumor blockage of bile ducts and pancreatic tumors and cysts.

Endoscopic ultrasound, where an ultrasound probe is built into the tip of an endoscope (a flexible lighted tube inserted into GI tract), can be used to find small stones in the gallbladder and common bile duct that cannot be detected by conventional ultrasound.\(^1\)

A hepatobiliary (liver-bile duct) scan with an intravenous isotope (radioactive for an element), which is concentrated in the liver and excreted into the bile to be stored in the gallbladder, is an important functional test that can differentiate asymptomatic stones from those stones blocking the ducts. If the test is positive, the gallbladder will not be seen on the imaging screen, as the isotope will not be able to enter the gallbladder due to cystic duct blockage. This is usually an indication for gallbladder removal surgery. With a negative test, the gallbladder and bile ducts are well visualized, and the patient’s gallstones may not be causing their problem. However, if the gallbladder is not contracting properly, the gallstones may still be a concern. A more complex and difficult test is endoscopic retrograde cholangiopancreatography (ERCP). This is generally reserved for more complex and hard to diagnose cases. ERCP is useful for showing strictures or scar tissue of bile ducts or of the sphincter of Oddi.\(^2\)

Gallstones cannot be diagnosed strictly on the basis of symptoms, for there are other conditions that can cause the same type of abdominal pain as well as intolerance to fatty food. These can include irritable bowel syndrome (IBS), gastroesophageal reflux disease (GERD), sphincter of Oddi dysfunction (a tight valve at the junction between the common bile duct and the duodenum),\(^3\) ulcers (usually duodenal), antral gastritis and parasitic disease.\(^4\) When gallbladder disease is suspected, the following should be ruled out: pancreatitis, duodenitis, gastritis and esophagitis— all conditions involving inflammation. In addition, a cardiac evaluation with an ECG and cardiac enzymes may be indicated since heart problems can present as gallbladder disease.

Most conventional doctors are unaware of the role that food allergies or sensitivities can play in gallstone formation. \(^5\) Those who are aware of this relationship may order a food sensitivity test (see the Appendix) to detect these.

Those physicians who are aware of the role that low HCl levels may play in gallstone formation may order a Heidelburg test (see the Appendix) to measure levels of this important acid.

Additionally, physicians usually order a liver function profile since elevation of liver enzymes is commonly an indicator of gallbladder problems.
What Is the Standard Medical Treatment?

When gallstones are silent (causing no symptoms), no treatment is generally recommended, and, unfortunately, all too often no lifestyle modifications are recommended to prevent future problems. Those problems can take the form of a gallbladder infection, which invariably will be treated with antibiotics. If the patient does not respond to antibiotic treatment and/or if the bile duct is blocked by gallstones, surgical removal of the gallbladder will most likely be the treatment of choice due to the drawbacks inherent in other conventional treatments including: stone removal, widening of the sphincter between the end of the common bile duct and the intestine to allow easier passage of stones, and use of drugs and other techniques to break up stones.26

Non-surgical approaches to gallstones are generally used for those patients who are unable to tolerate surgery. One such approach involves oral dissolution therapy using bile salts (chenodeoxycholic acid and ursodeoxycholic acid). Here medication that alters the composition of the bile is taken by mouth. The bile salts used in this approach promote increased cholesterol solubility. While this is a desirable effect, there are drawbacks to oral bile-salt therapy: it works only on cholesterol stones; it can have undesirable side effects, including mild diarrhea and possible liver damage; it is extremely slow-working, taking six months or more to dissolve stones; complete disappearance of stones happens only in a minority of cases; there is a tendency of stones to recur after dissolution; full-dose therapy must be continued indefinitely, or stones may re-form when the drug is discontinued.27

Contact dissolution is another non-surgical approach to treatment of gallstones. Here, a chemical, methyl-tert-butyl ether (MTBE), is injected directly into the gallbladder through a catheter that is passed through the abdominal wall. The downside of this therapy is that the MTBE has an extremely unpleasant odor; it causes pain in the upper abdomen; it may cause nausea and vomiting; it may cause damage to the kidneys if it escapes from the gallbladder and recurrence of stones is possible.28

Extracorporeal shock-wave lithotripsy (ESWL) is another non-surgical treatment for gallstones. This is a non-invasive but expensive procedure involving the use of
sound waves to break up stones. It only works for small cholesterol stones that are not calcified (less than 10 percent of the typical gallbladder cases seen in the U.S.), and no more than three stones can be treated at a time. Although this procedure has worked well in combination with bile-salt therapy, there have been some associated side effects (biliary pain and some bleeding into the kidney).

The non-surgical approaches described above are, according to the “Merck Manual” (the physician’s guide to diagnosis and treatment), “… now largely unavailable owing to greater patient acceptance of laparoscopic cholecystectomy.” Translation: Patients prefer to have their gallbladders removed. In fact, gallbladder removal is one of the most commonly performed surgical procedures.

Removal of the entire gallbladder to cure the gallstone problem may seem extreme, but the thinking is this: Simply removing the stones does no good; the abnormal bile would re-form them. In addition, the damaged lining of the gallbladder tends to allow for recurrent stone formation. Medicine views the gallbladder as a dispensable organ. After all, certain animals (rats, horses, pigeons) get along without a gallbladder as can most humans. A common temporary side effect can be diarrhea. This usually clears in one to two months as the liver and the intestines begin to compensate for having no gallbladder. About one percent of patients may have chronic diarrhea.

The type of cholecystectomy (gallbladder removal) most commonly done today is the laparoscopic variety introduced in 1988. Known as “keyhole surgery,” it involves entering the abdomen through the navel, with three additional small incisions made for the insertion of instruments and a small video camera. The video camera is attached to an external monitor used to guide the surgeon’s movements. There are several advantages of laparoscopic over conventional (open) cholecystectomy, which involves a 5- to 8-inch incision and one week of hospitalization.

These advantages include:
- Less pain
- Quicker healing
- Improved cosmetic results
- Fewer complications

In addition to gallstones in the gallbladder, it is possible to have stones retained in the cystic duct or common bile duct at the time of gallbladder removal. This can be prevented by taking an x-ray at the time of surgery. There are also cases where stones are formed in the liver ducts due to sluggish bile flow and infection. In all these cases, common bile-duct exploration would be needed. Laparoscopic exploration is one such method. For smaller gallstones, endoscopic retrograde cholangiopancreatography (ERCP) is used with sphincterotomy to remove the gallstones through the sphincter of Oddi, located at the end of the common bile duct that leads into the duodenum.

Open surgery is still used today for complex cases, and when complications are encountered in the laparoscopic approach. With either surgery, complications are possible. These include:

- Injury to the common bile duct – This is the most common complication; it can cause leakage of bile and/or infection, and may necessitate corrective surgery. Scarring of any part of the duct may lead to obstruction causing repeated complex operations. Severe disability and even death can result if the problem is not completely corrected.
- Adhesions – These are unnatural connections of body tissues.
- Leftover stones in the bile duct – This usually can be handled with endoscopic removal of the stones via the ampulla of Vater (opening of the bile duct into the duodenum).
- Bile leakage from the gallbladder bed in the liver. This can cause subhepatic abscess formation requiring either radiologic or surgical drainage.
- A portion of the cystic duct left behind – When this happens, retained stones could enter the common bile duct and cause problems.
I have seen many patients present with classical signs and symptoms of acute cholecystitis; namely right upper-abdominal pain, with radiating pain under the right scapula (shoulder blade); nausea and vomiting, especially after a fatty meal; and yes, commonly with the five Fs: female, fair, fat, fertile, and 40 and with gallstones on ultrasound.

However, I would like to point out that there are many other possible presentations ranging from the signs and symptoms of a heart attack, to heartburn, indigestion, ulcers or even small bowel obstruction. In fact, gallstone ileus is a condition whereby a large gallstone migrates through the wall of an inflamed gallbladder right through the wall of a piece of intestine adherent to the gallbladder. The large stone now in the intestine can cause a bowel obstruction, which often requires surgery unless it is small enough to pass.

Some patients have no symptoms, and do not even have gallstones, but can be acutely and deathly ill from what is known as acalculus cholecystitis (without stones and an inflamed gallbladder). This is an extreme example of toxic or infected bile, which can be due to increased intestinal permeability (leaky gut).

Many hospitalized patients are not eating for various reasons, and are on many medications, including antibiotics. This sets the stage for serious malnutrition of the intestinal lining. Most people are not aware that the intestinal lining feeds itself before any food is absorbed into the bloodstream. From the bloodstream and lymphatics, food is then taken to the liver for processing and detoxification if necessary.

In the presence of malnutrition, overgrowth of yeast and/or pathogenic bacteria (often as a result of antibiotics) and stress, there can be a pathologic increase in intestinal permeability. Viral and bacterial particles and toxins and poorly digested food remnants (especially in the colon) that have been sitting there for days can now go to the liver via the circulation. When the liver is overwhelmed, some substances are detoxified but others get by untouched. In addition, if there is a shortage of sulfur-containing amino acids, the liver itself will take some toxins and convert them into new compounds that are even more toxic.

Thus, there can be highly toxic and/or infected bile that literally burns the liver, bile ducts and gallbladder. When the gallbladder stores this infected toxic material, it then starts destroying the wall of the gallbladder and is absorbed into the blood creating a true surgical emergency. If the patient is too sick to be operated upon, radiology can place a drain in the gallbladder as a temporary treatment.

To make matters worse, the infected toxic bile enters the duodenum and begins a destructive path of inflammatory damage to the duodenum, pancreas and small intestine. This greatly exacerbates the original problem; the inflamed pancreas will not deliver needed enzymes, and the inflamed small intestine will be more damaged allowing more toxins to leak through and creating a dangerous vicious cycle for the body.

The above example is indicative of how the intestine, liver, gallbladder and pancreas are all interconnected, not only in health, but in disease as well.
Brenda’s Bottom Line

Clearly, at times, there may be no alternative to gallbladder removal, depending on the individual case. In many instances, however, diet and lifestyle modification can play a key role in halting the growth of gallstones and reducing the frequency and severity of gallbladder attacks. Most nutritionally-oriented physicians are aware that a high-fiber diet featuring whole grains, fruits and vegetables can reduce the amount of cholesterol in bile and the tendency to form stones. Reduced fat intake (namely, less meat and dairy products) means less cholesterol in the bile which may prevent further stone formation. Such doctors would also advocate a low-sugar diet based on the fact that several studies have indicated that people who eat a lot of sweets are more likely to develop gallstones. This may be due to the fact that increased sugar entering the liver activates its conversion into triglycerides and then into cholesterol. The liver is the first line of defense against elevated blood sugar from the diet.

In dealing with gallstones, the stimulation of bile flow is essential. Gallstones often form due to stagnation in the flow of bile, which can be likened to a constipation of the gallbladder. In the liver, bile flows through tributary-like ducts that merge into a larger duct that flows into the gallbladder. Stimulating this flow is essential, and can be done with natural ingredients found in liver support formulas.

If the gallbladder has already been removed, for a period of about six months, bile flow through the digestive system is not regulated. To soak up excess bile, you need to increase your daily intake of soluble fiber. The easiest way to do this is with a soluble fiber supplement. (See the chart on the next page.)

**Rule Out:**
- Foods sensitivities (See the Gluten Sensitivity and Allergies sections.)
- Parasites (See the Parasitic Disease section.)
- Low HCl in the stomach – Heidelberg test.

(See the Appendix.) A simple test of low stomach acid is to take a hydrochloric acid capsule (500 mg to 650 mg) before a meal. Then, with each subsequent meal, add another capsule until you feel a burning sensation. Then back off to the previous dose.

**Recommended Testing**
- Foods sensitivity test (See the Appendix)
- Heidelberg pH test (See the Appendix)

**Diet**
- Follow the Fiber 35 Eating Plan in the Appendix of this book. A two- to three-day juice fast would be beneficial especially in cases of gallbladder inflammation.
- Decrease coffee intake (coffee intake increases dehydration)
- Reduce intake of sugar and refined carbohydrates as this has been associated with gallstones.
- Don’t skip breakfast (fasting longer than 14 hours elevates gallstone risk).
- Drink plenty of water (about half the body weight in ounces) which is necessary to dilute bile.
- Avoid spicy and fried foods.

**Lifestyle**
- If overweight, lose weight slowly; no crash dieting.
- Avoid synthetic hormones.
- Chew food well for best digestion.
- Exercise daily to reduce risk of gallstones.

**Complementary Mind/Body Therapies**
- Colon hydrotherapy could be helpful in cases of constipation and will assist in liver detoxification. Try it with the Steps of Cleansing program or liver detox program. (See the Appendix.)
- Acupuncture can be beneficial with gallbladder problems.
### Critical Phase

**Total Body Cleanse**
- **Dosage:** See Appendix
- **Benefit:** Encourages elimination and detoxification.
- **Comments:** Herbal formula should support the seven channels of elimination.

**Liver Detox**
- **Dosage:** This should follow the Total Body Cleanse. See Appendix
- **Benefit:** Encourages detoxification involving the liver and gallbladder.
- **Comments:** Should contain milk thistle seed extract containing silymarin, phosphatidylcholine, selenium and herbs.

### Helpful

**High Potency Multi-vitamin/mineral**
- **Dosage:** Use as directed
- **Benefit:** Provides needed nutrients that may be deficient.
- **Comments:** Powder or liquid formulation would be helpful as it is easier assimilated and absorbed.

**Vitamin D₃**
- **Dosage:** At least 1,000 to 2,000 iu daily
- **Benefit:** Vitamin D may not be absorbed well with gallbladder dysfunction.
- **Comments:** Research is showing many health complications as a result of low vitamin D levels.

**Peppermint oil**
- **Dosage:** 0.2 - 0.4 ml 3 times daily
- **Benefit:** May help to dissolve gallstones.
- **Comments:** Be sure to use enteric coated peppermint oil.

### Daily Maintenance

**Lecithin**
- **Dosage:** 1200 mg lecithin with meals
- **Benefit:** Emulsifies fat, helping with its digestion.
- **Comments:** May use phosphatidyl choline instead, 500 mg daily.

**Critical Liver Support Formula**
- **Dosage:** Use as directed
- **Benefit:** Enhances liver and gallbladder function.
- **Comments:** Should include milk thistle seed extract containing silymarin, N-acetyl-cysteine, alpha lipoic acid, L-glutathione.

**Digestive Enzymes**
- **Dosage:** Take with meals
- **Benefit:** Helps digest and absorb nutrients from food to reduce liver and gallbladder stress.
- **Comments:** Formula containing betain HCl may be helpful for those with low stomach acid.

**Omega-3 Fatty Acids**
- **Dosage:** At least 2 grams daily of EPA/DHA combination
- **Benefit:** Reduces inflammation.
- **Comments:** Look for a concentrated, enteric coated fish oil.

**Fiber**
- **Dosage:** 4-5 grams twice daily
- **Benefit:** Promotes regular bowel movement and absorbs excess bile.
- **Comments:** Look for a soluble/insoluble fiber blend. Use in conjunction with high fiber diet to reach 35g daily.

**Probiotics**
- **Dosage:** 30 - 80 billion culture count twice daily
- **Benefit:** Restores bacterial balance and pH of colon and promotes regularity.
- **Comments:** Look for high amount of bifidobacteria, the main beneficial bacteria in colon.

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*See further explanation of supplements in the Appendix*