



Patient Information Sheet: Gallstones and Related Conditions

What are gallstones?

Gallstones are solid deposits of cholesterol, bile salts or bilirubin that form in the gallbladder. The gallbladder is a small organ under the liver that stores and releases bile, a fluid that helps digest fats.

Gallstones can vary in size, shape and number. Some people have only one or a few small stones, while others have many large stones.

Gallstones can cause problems such as inflammation or infection if they block the flow of bile from the gallbladder or in the bile ducts, which are the tubes that connect the gallbladder to the liver and the small intestine.

What are the common related conditions?

Biliary colic: This is a sudden and severe pain in the upper right or middle abdomen, caused by a gallstone blocking the cystic duct, the tube that connects the gallbladder to the bile duct. The pain usually lasts from a few minutes to a few hours and may be accompanied by nausea, vomiting or sweating. Biliary colic does not cause fever or jaundice (yellowing of the skin or eyes).

Cholecystitis: This is an inflammation or infection of the gallbladder, usually due to a gallstone blocking the cystic duct for a long time. The pain is similar to biliary colic but more persistent and may be associated

with fever or chills. Cholecystitis can lead to complications such as gangrene, perforation or abscess of the gallbladder.

Pancreatitis: This is an inflammation of the pancreas, caused by a gallstone traversing the bile duct and blocking the associated pancreatic duct. The pain is usually severe and constant, located in the upper or middle abdomen, and may radiate to the back. Pancreatitis can also cause nausea, vomiting and fevers. Pancreatitis itself can be a very severe condition, and can lead to complications such as necrosis or infection of the pancreas.

Cholangitis: This is an inflammation or infection of the bile ducts, caused most commonly by a gallstone blocking the common bile duct. The pain is similar to biliary colic or cholecystitis but may be more severe and fluctuating. Cholangitis can also cause fevers and jaundice. It is a very serious condition and must be treated urgently.

What are the causes and risk factors for gallstones?

The exact cause of gallstones is not fully understood, but occurs when an imbalance in the chemicals that make up bile form a solid precipitant. The known risk factors for their formation include:

- Being female



- Having children
- Being overweight
- Rapid weight loss
- Having a fair complexion

What are the symptoms?

Many people with gallstones do not have any symptoms and are unaware of their condition. These are called asymptomatic or silent gallstones and do not require treatment or surveillance.

Symptoms commonly associated with gallstones and their related conditions:

- Pain in the upper right or middle abdomen, especially after eating fatty foods.
- Nausea, vomiting, bloating, or indigestion.
- Fever and chills, which suggest the presence of inflammation or infection.
- Jaundice, which suggests involvement of the bile duct.

These symptoms may vary in frequency, intensity and duration depending on the type and severity of the related condition.

Notably diarrhoea and altered bowel habit are not usually related to gallstone disease.

How are they diagnosed?

If you have symptoms suggestive of gallstones or related conditions, your doctor will ask you about your medical history, perform a physical examination and order some tests to confirm the diagnosis and rule out other causes of abdominal pain.

The most common test used to diagnose gallstones is an ultrasound, which uses

sound waves (like sonar) to create images of the gallbladder and the bile ducts.

Ultrasound can detect the presence, size and number of gallstones, as well as signs of inflammation or infection of the gallbladder, the bile ducts and the pancreas.

Other tests that may be used to diagnose gallstones or related conditions include:

CT scan or MRI, to obtain more detailed images of the abdomen and the biliary tract.

Blood tests, to check the levels of bilirubin, liver enzymes, lipase, and markers of inflammation or infection such as a white blood cell count or C-reactive protein.

How are they treated?

The treatment of gallstones and related conditions depends on specific condition in question, the presence and intensity of the symptoms, the risk of complications both of treating and not treating the condition, and the overall health of the patient.

Treatment options include:

Observation and monitoring for asymptomatic patients. The patient may be advised to follow a low-fat diet and to drink plenty of fluids, and to report any changes in symptoms or signs of complications.

Surgery is the mainstay of treatment for symptomatic gallstone disease. By far and away the most common operation to do this is called a laparoscopic cholecystectomy with an intraoperative cholangiogram. This is outlined in more detail below.

Other procedures which may be required in the treatment of gallstone disease include an endoscopic retrograde



cholangiopancreatography (ERCP) or cholecystostomy.

Medications are commonly used as an adjunct for relief of symptoms or prevention of complications, and for patients not suitable for surgery. The patient may be prescribed antibiotics, painkillers, anti-inflammatory drugs.

Laparoscopic cholecystectomy with intraoperative cholangiogram

This is the name of the operation most commonly performed in the treatment of gallstone disease.

It means keyhole surgery to remove the gallbladder and taking an x-ray during the procedure to check the bile ducts.

During this procedure you are fully anaesthetised and small cuts are made in your abdomen to enter it and insufflate it with carbon dioxide to allow the surgeon to see what they need to operate.

Removal of gallbladder itself involves dissecting it free from the surrounding critical structures such as the duodenum, colon, bile duct and hepatic artery, and then controlling and dividing the cystic artery and cystic duct to allow the gallbladder to be separated and peeled off the liver bed.

During this operation a cholangiogram, an X-ray of the bile ducts using a contrast dye, is usually taken to ensure no stones are in the duct and no damage to the duct has occurred during the operation.

This operation is a highly effective treatment for gallstone disease and significant complications from this operation are uncommon. However, as with all surgeries, complications can occur, and if you need an operation your surgeon will discuss them with you in detail.

After the operation the patient can usually go home the same day or the next day. They can expect to be a bit sore, especially on movement, but this is usually controllable with pain relief. Sometimes the patient can experience shoulder tip pain after a keyhole operation, related to the gas used in insufflation. Sometimes nausea can occur and this is most commonly related to the medications used in anaesthesia.

The sutures used are dissolvable and dressings remain for about five days. The patient is usually back at work in 1-2 weeks but should avoid lifting heavy objects for 6 weeks. The surgeon will follow up with you to discuss your post-operative course and the gallbladder histology. Long term most patients can eat and drink without restriction. Bring on the Brie!



Patient Consent Form for Laparoscopic Cholecystectomy and Intraoperative Cholangiogram

Why perform a laparoscopic cholecystectomy and intraoperative cholangiogram?

A laparoscopic cholecystectomy, the removal of the gallbladder via keyhole surgery, is most commonly performed to treat gallstones and related complications, such as inflammation or infection of the gallbladder. Sometimes this procedure is required to treat gallbladder polyps or gallbladder dyskinesia.

An intraoperative cholangiogram, an x-ray taken with a contrast dye during the operation, is performed to identify any stones or abnormalities or damage to the bile ducts.

How are these procedures performed?

A laparoscopic cholecystectomy is a minimally invasive procedure where small incisions are made in the abdomen to insert a laparoscope and surgical instruments. The gallbladder is freed from its surrounding structures and then its cystic duct and blood supply are controlled and then cut. The gallbladder is then peeled off the liver and removed.

Whilst controlling the cystic duct, a catheter is inserted into that duct and a contrast dye injected and x-ray taken - this is the intraoperative cholangiogram.

What are the benefits?

- Relief from symptoms caused by gallstones or such as pain or fevers.
- Prevent future biliary colic/pain or complications arising from gallstones such as cholecystitis (inflammation of the gallbladder) or pancreatitis.
- If gallbladder polyps are present, prevent their evolution to gallbladder cancer.

What are the risks?

- Damage to the bile duct, the organ that connects the gallbladder to the digestive system. If damaged, a major procedure would be required to fix it. Damage occurs in approx. 1:400-500 cases.
- Leak of bile into the abdomen, requiring another procedure to fix it.
- Damage to other nearby organs such as the colon, duodenum, stomach, small bowel and liver. This may be occult (not recognised at time of surgery). Often another operation is required to fix the problem.
- Bleeding and infection at the surgical site. Occasionally this requires further procedures to correct.
- Possible need for conversion to open surgery.
- General operative and anaesthetic risks such as a heart attack, stroke, deep vein thrombosis or pulmonary embolus development, infection of other organs such as the lung.
- Death as a result of this operation is rare.



What are the alternatives?

- Surgery is usually not indicated if there are no symptoms attributable to the gallstones.
- Dietary modification to reduce fat intake may reduce symptom frequency and severity, although this approach does not usually alleviate the problem or risks completely.
- Unfortunately, no medications have been found to effectively dissolve gallstones.
- An endoscopic retrograde cholangiopancreatography (ERCP) procedure is sometimes required first to remove stones from the bile ducts prior to performing a laparoscopic cholecystectomy and cholangiogram.

What to expect before, during, and after the procedure

Before the procedure:

- Optimisation particularly of weight can make the operation safer. If overweight, 5-10kg of weight loss using an Opti-Fast diet in the two weeks leading up to operation can be very helpful.
- There will be a period of fasting on the day of surgery before the procedure.
- Discuss medications you are taking with your surgeon and anaesthetist, as some may need to be paused.

During the procedure:

- You will receive general anaesthesia to ensure you are comfortable and pain-free during the surgery.
- Typically, the operation takes about 60 minutes.

After the procedure:

- You will be monitored in the recovery room until the anaesthesia wears off and typically discharge the same day.
- The dressings should be kept clean and dry and remain on for 5-7 days. The sutures are dissolveable.
- Plan to take it easy. Avoid vigorous exercise and lifting >5kg for 6 weeks.
- Attend your planned follow-up appointment. If you have concerns prior to this, contact your surgeon, see your GP or present to the Emergency Department.

Questions

Please write any questions you may have regarding the procedure below:

Consent

I understand the information provided above regarding the laparoscopic cholecystectomy and intraoperative cholangiogram procedure, its benefits, risks, and alternatives. I have had the opportunity to ask questions and have received satisfactory answers. I hereby give my consent to undergo the procedure.

Patient Name: _____

Patient Signature: _____

Date: _____

Surgeon Name: _____

Surgeon Signature: _____

Date: _____