

Cholecystectomy

Surgical Removal of the Gallbladder



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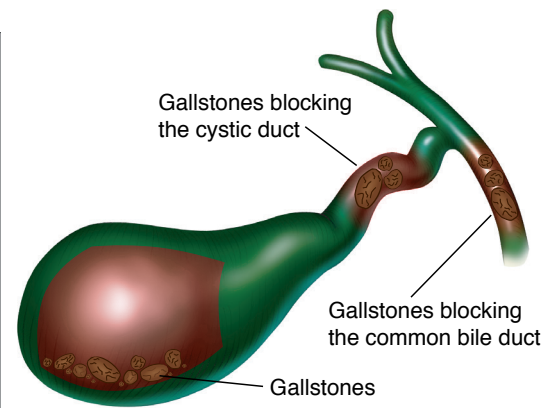
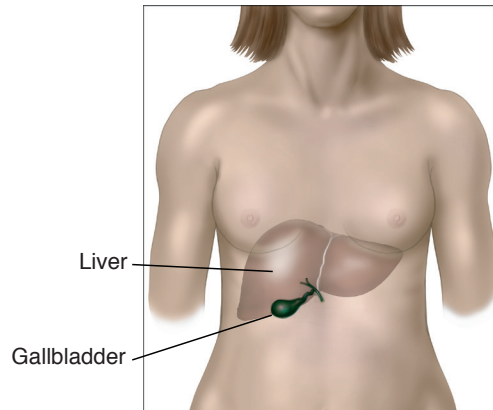
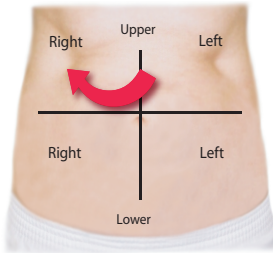
The Condition

Cholecystectomy is the surgical removal of the gallbladder. The operation is done to remove the gallbladder due to gallstones causing pain or infection.

Symptoms

The most common symptoms of cholecystitis are:¹

- Sharp pain in the right upper abdomen
- Low fever
- Nausea and bloating
- **Jaundice** (yellowing of the skin) may occur if gallstones are in the common bile duct



Benefits and Risks of the Operation

Benefits—Gallbladder removal will relieve pain, treat infection, and, in most cases, stop gallstones from coming back.

Possible risks include—Bile leak, bile duct injury, bleeding, infection of the abdominal cavity (peritonitis), fever, liver injury, infection, numbness, raised scars, hernia at the incision, anesthesia complications, puncture of the intestine, and death.⁴

Risks of not having an operation—The possibility of continued pain, worsening symptoms, infection or bursting of the gallbladder, serious illness, and possibly death.⁵

Expectations

Before your operation— Evaluation usually includes blood work, a urinalysis, and an abdominal ultrasound. Your surgeon and anesthesia provider will discuss your health history, home medications, and pain control options.

The day of your operation— You will not eat for 4 hours but may drink clear liquids up to 2 hours before the operation.

Most often, you will take your normal medication with a sip of water. You will need someone to drive you home.

Your recovery— If you do not have complications, you usually will go home the same day after a laparoscopic procedure or in 1 to 2 days after an open procedure.⁵

Call your surgeon if you have severe pain, stomach cramping, chills, a high fever (over 101°F or 38.3°C), odor or increased drainage from your incision, your skin turns yellow, no bowel movements for three days, or vomiting and the inability to keep fluids down.

Treatment Options

Surgical Procedure²

Laparoscopic cholecystectomy—

The gallbladder is removed with instruments placed into small incisions in the abdomen.

Open cholecystectomy—

The gallbladder is removed through an incision on the right side under the ribcage.

Nonsurgical Procedure

Stone removal by endoscopy

For Gallstones without Symptoms

Watchful waiting for all patients³

Increased exercise

SURGICAL PATIENT EDUCATION PROGRAM

Prepare for the Best Recovery

This first page is an overview. For more detailed information, review the entire document.

The Condition

The Gallbladder

The gallbladder is a small pear-shaped organ under the liver. The liver makes 3 to 5 cups of bile every day which is stored in the gallbladder. The gallbladder sends bile to the small intestine through ducts to help digest fats in food.¹

Gallstones

Gallstones are hardened digestive fluid that can form in your gallbladder. Gallstones can leave the gallbladder and block the flow of bile through the ducts and cause pain and swelling of the gallbladder (Cholecystitis).

Common Tests

History and Physical Exam⁶

Your health care provider will ask you about your pain and any stomach problems.

Additional Tests (see Glossary)

Other tests may include:

- Blood tests, including complete blood count
- Liver function tests
- Coagulation profile
- **Abdominal ultrasound** is the most common study for gallbladder disease. You may be asked not to eat for 8 hours before the test.
- **Hepatobiliary iminodiacetic acid scan (HIDA scan)**

- **Endoscopic retrograde cholangiopancreatography (ERCP)**
- **Magnetic resonance cholangiopancreatography (MRCP)**

Gallstones are more common in people who:⁴

- Are Native American
- Have a family history of gallstones
- Are overweight
- Have sickle cell disease
- Are pregnant
- Lose weight rapidly
- Use estrogen to manage menopause

Cholecystitis in Children

In children, inflammation of the gallbladder can be caused by gallstones. This is called acute (sudden) calculous (with gallstones) cholecystitis (ACC). ACC is most common in children with intestinal diseases and sickle cell disease.⁷ Children with sickle cell disease should have an ultrasound screening for gallstones.⁸ A more frequent type of cholecystitis in children is acute acalculous (without gallstones) cholecystitis (AAC). Children with cholecystitis who have pain, fever, nausea or jaundice (yellow skin) may be treated with IV fluids, antibiotics and non-opioid pain medication in the hospital. Cholecystectomy may be recommended for children with painful gallstones. The procedure is most often done laparoscopically through small incisions in the belly button or abdomen.

Questions to Ask

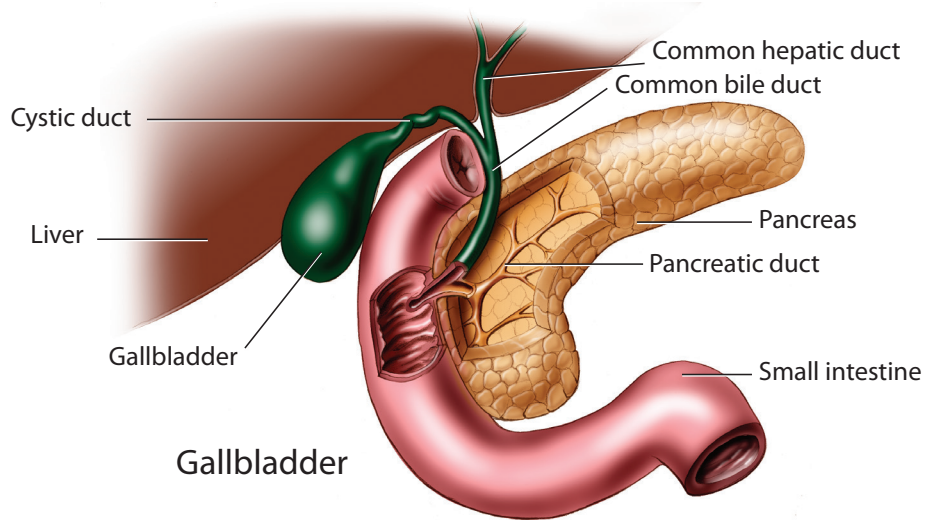
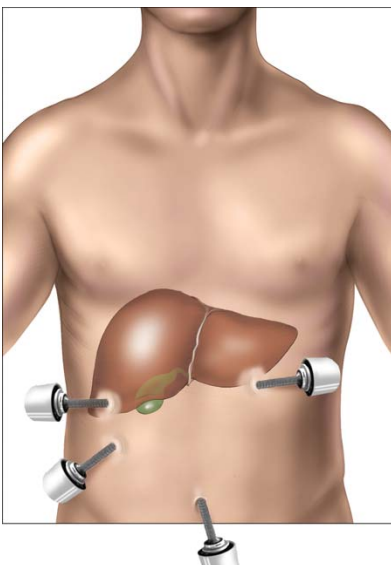
About my operation:

- What are the risks and side effects of general anesthesia?
- What type of procedure will be used to remove the gallbladder—laparoscopic or open?
- Ask your surgeon how frequently they perform this procedure?
- What are the risks of this procedure for myself or my child?
- What level of pain after surgery should I expect and how will it be managed?
- How long will it be before I can return to my normal activities—work, driving, lifting?
- What can I expect after the operation?
- What type of care will I have to provide for myself?
- Will I have drains or tubes?

Laparoscopic Cholecystectomy

This technique is the most common for cholecystectomy.² The surgeon will make several small incisions in the abdomen. Ports (hollow tubes) are inserted into the abdomen, through the openings. Surgical tools and a lighted camera are placed into the ports. The abdomen is inflated with carbon dioxide gas to make it easier to see the internal organs. The gallbladder is removed, and the port openings are closed with sutures, surgical clips, or glue.

Laparoscopic Cholecystectomy



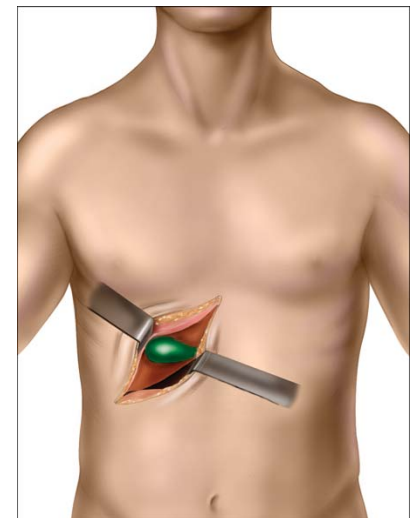
Open Cholecystectomy

The surgeon makes an incision approximately 6 inches long in the upper right side of the abdomen and cuts through the fat and muscle to reach the gallbladder. The gallbladder is removed, and the cystic duct is clamped off. The site is stapled or sutured closed. A small drain may be placed going from the inside to the outside of the abdomen. The drain is usually removed in the hospital. Your surgeon may start with a laparoscopic technique and need to change (convert) to an open laparotomy technique.

The procedure takes about 1 to 2 hours.

- Conversion rates from laparoscopic to open for elective surgery in healthy patients is 7.5%.⁹
- The chance of conversion increases up to 30% if you are over 50 years old, are male, and have acute cholecystitis; have had past abdominal operations; or have high fever, high bilirubin, repeated gallbladder attacks, or conditions that limit your activity.^{9,10}

Open Cholecystectomy



Nonsurgical Treatment

Gallstones affect about 1 in 7. Eighty percent of adults with gallstones are not bothered by them and many go 20 years without symptoms.¹¹ Current guidelines recommend watchful waiting until they cause symptoms.³

If you have gallstones without pain, exercise at least 2-3 times each week to reduce your risk of cholecystitis. Eat more fruits and vegetable and less sugar, carbohydrates and fats.

Risks Based on the ACS Risk Calculator

Open Cholecystectomy and Laparoscopic Cholecystectomy from the ACS Risk Calculator – July 1, 2021

Risks	Percent for Average Patient	Keeping You Informed
Pneumonia: Infection in the lungs	Open 1.7% Laparoscopic 0.2%	You can decrease your risk by rinsing with antiseptic mouthwash the morning of your operation (to decrease mouth bacteria), quitting smoking before your operation, and getting up often to walk post-operatively.
Heart complication: Heart attack or sudden stopping of the heart	Open 0.9% Laparoscopic 0.1%	Problems with your heart or lungs can be affected by general anesthesia. Your anesthesia provider will take your history and suggest the best option for you.
Wound infection	Open 7.0% Laparoscopic 1.0%	Antibiotics are not routinely given except for high-risk patients. You should wash your abdomen with an antimicrobial soap such as dial the night before the operation.
Urinary tract infection: Infection of the bladder or kidneys	Open 0.8% Laparoscopic 0.4%	A Foley catheter may be placed during surgery to drain the urine. Let your surgical team know if you have trouble urinating after the tube is removed—this is more common in older men or if an epidural is used for pain.
Blood clot: A blood clot in the legs can travel to the lung	Open 1.0% Laparoscopic 1.0%	Longer surgery and bed rest increase the risk. Walking 5 times/day and wearing support stockings reduce the risk.
Renal (kidney) failure: Kidneys no longer function in making urine and/or cleaning the blood of toxins	Open 0.9% Laparoscopic 0.1%	Pre-existing renal problems, Type 1 diabetes, being over 65 years old, and other medications may increase the risk.
Return to surgery	Open 2.7% Laparoscopic 0.6%	Bile leakage or a retained stone may cause a return to surgery or require additional endoscopy or radiology procedures. Your surgical team is prepared to reduce all risks of return to surgery. ¹
Death	Open 0.8% Laparoscopic 0.1%	Your surgical team will review for possible complications and be prepared to decrease all risks.
Discharge to nursing or rehabilitation facility	Open 7.6% Laparoscopic 0.7%	Pre-existing health conditions can increase this risk.
Bile Duct Injury/Leakage ^{*12}	Open 1/1,000 patients	Injury can happen between 1 week to 6 months after the operation from fever, pain, jaundice, or bile leakage from the incision. Further testing and surgery may be needed. ¹²
Retained common bile duct stone ^{*1}	Open 1.8%	A gallstone may pass after surgery and block the bile from draining. The stone should be removed because of an increased risk of biliary obstruction or inflammation of the pancreas or bile duct. ¹
Pregnancy Complications, premature labor and fetal loss [*]	Fetal loss 4% (uncomplicated removal) up to 60% if pancreatitis	Most pregnant women with gallstones will have no symptoms during pregnancy. If you have biliary disease or pancreatitis, gallbladder removal will be offered to reduce maternal complications. ¹³

1% means that 1 of 100 people will have this complication

^{*}Results from the last 10 years of literature

The ACS Surgical Risk Calculator estimates the risk of an unfavorable outcome. Data is from a large number of patients who had a surgical procedure similar to this one. If you are healthy with no health problems, your risks may be below average. If you smoke, are obese, or have other health conditions, then your risk may be higher.

This information is not intended to replace the advice of a doctor or health care provider.

To check your risks, go to the ACS Risk Calculator at <http://riskcalculator.facs.org>.

Expectations: Preparing for Your Operation

Preparing for Your Operation

Home Medication

Bring a list of all of the medications and vitamins that you are taking, including blood thinners, aspirin, or NSAIDs. Some medications can affect your recovery and response to anesthesia and may have to be adjusted before and after surgery. You can usually take your morning medication with a sip of water. Resources about medications can be found at www.facs.org/patienteducation/medications.html.

Anesthesia

Let your anesthesia provider know if you have allergies, neurologic disease (epilepsy, stroke), heart disease, stomach problems, lung disease (asthma, emphysema), endocrine disease (diabetes, thyroid conditions), or loose teeth; if you smoke, drink alcohol, use drugs, including marijuana, or take any herbs or vitamins; or if you have a history of nausea and vomiting with anesthesia.

If you smoke, let your surgical team know, and you should plan to quit. Quitting before your surgery can decrease respiratory and wound complications and increase your chances of staying smoke-free for life. Resources to help you Quit Smoking Help may be found at www.facs.org/patienteducation/quitsmoking.html.

Length of Stay

If you have a laparoscopic cholecystectomy, you may go home the same day. You may stay overnight if you had an open cholecystectomy, a laparoscopic repair with a longer anesthesia time, severe nausea and vomiting after surgery, or you are unable to pass urine.

The Day of Your Operation

- Do not eat for 4 hours or drink anything but clear liquids for at least 2 hours before the operation.
- Shower and clean your abdomen and groin area with a mild antibacterial soap.
- Brush your teeth and rinse your mouth out with mouthwash.
- Do not shave the surgical site; your surgical team will clip the hair nearest the incision site.

What to Bring

- Insurance card and identification
- Advance directives (see Glossary)
- List of medicines
- Loose-fitting, comfortable clothes
- Slip-on shoes that don't require that you bend over
- Leave jewelry and valuables at home

What You Can Expect

An identification (ID) bracelet and allergy bracelet with your name and hospital/clinic number will be placed on your wrist. These should be checked by all health team members before they perform any procedures or give you medication. Your surgeon may mark and initial the operation site.

Fluids and Anesthesia

An intravenous line (IV) will be started to give your fluids and medication. For general anesthesia, you will be asleep and pain-free. A tube will be placed down your throat to help you breathe during the operation. For spinal anesthesia, a small needle with medication will be placed in your back near your spinal column.

After Your Operation

You will be moved to a recovery room where your heart rate, breathing rate, oxygen saturation, blood pressure, and urine output will be closely watched. Be sure that all visitors wash their hands.

Preventing Pneumonia and Blood Clots

Movement and deep breathing after your operation can help prevent postoperative complications such as blood clots, fluid in your lungs, and pneumonia. Every hour, take 5 to 10 deep breaths and hold each breath for 3 to 5 seconds.

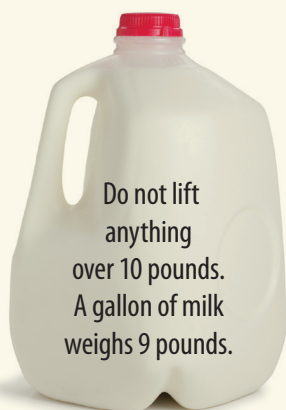
You can decrease bloodclots by getting up and walking 5 to 6 times per day, wearing special support stockings or compression boots on your legs, and, for high-risk patients, taking a medication that thins your blood.

Your Recovery and Discharge

Keeping You Informed

High-Fiber Foods

- Foods high in fiber include beans, bran cereals and whole-grain breads, peas, dried fruit (figs, apricots, and dates), raspberries, blackberries, strawberries, sweet corn, broccoli, baked potatoes with skin, plums, pears, apples, greens, and nuts.



Do not lift anything over 10 pounds. A gallon of milk weighs 9 pounds.

Your Recovery and Discharge

Thinking Clearly

Anesthesia or pain medication may cause you to feel different for 2 or 3 days, have difficulty with memory, or feel more fatigued. You should not drive, drink alcohol, or make any big decisions for at least 2 days.

Nutrition

- When you wake up from the anesthesia, you will be able to drink small amounts of liquid. If you do not feel sick, you can begin eating regular foods.
- Continue to drink about 8 to 10 glasses of water per day.
- Eat a high-fiber diet so you don't strain while having a bowel movement.

Activity

- Slowly increase your activity. Patients usually take 1 to 3 weeks to return comfortably to normal activity.
- Persons sexually active before the operation reported being able to return to sexual activity in 14 days (average).

Work and Return to School

- You may usually return to work 1 week after laparoscopic or open surgery, as long as you don't do any heavy lifting. Discuss the timing with your surgeon. Typically, you are discouraged from lifting items heavier than 10 pounds or participate in strenuous activity for at least 4 to 6 weeks.



Handwashing



Steri-Strips®

Wound Care

- Always wash your hands before and after touching near your incision site.
- Do not soak in a bathtub until your stitches, Steri-Strips®, or staples are removed. You may take a shower after the second postoperative day unless you are told not to.
- A small amount of drainage from the incision is normal. If the dressing is soaked with blood, call your surgeon.
- If you have Steri-Strips in place, they will fall off in 7 to 10 days.
- If you have a glue-like covering over the incision, just let the glue flake off on its own.
- Avoid wearing tight or rough clothing. It may rub your incisions and make it harder for them to heal.
- Your scars will heal in about 4 to 6 weeks and will become softer and continue to fade over the next year.
- View the Surgical Wounds Booklet at facs.org/woundcare
- **When to call your surgeon:**
 - Pain that will not go away or gets worse
 - A fever of more than 101°F or 38.3°C
 - Continuous Vomiting
 - Redness, swelling, bleeding or bad smelling drainage from your wound
 - Strong or continuous abdominal pain or swelling
 - No bowel movement 2 to 3 days after the operation

Pain Control

Pain Control

Your pain can be controlled using acetaminophen (Tylenol®) and ibuprofen (Motrin®, Advil®). Non-medication therapies, such as ice may also be effective. For severe pain that is keeping you from moving and sleeping, an opioid may be needed. By day 4, most people report no severe pain after an operation. Pain from the surgical incision is usually gone in 7 to 10 days. See the **Safe and Effective Pain Control Guide** below or on the ACS website for more information. <https://www.facs.org/education/patient-education/safe-pain-control>

How Intense is my pain	What Can I Take to Feel Better	Most Common Therapies
<ul style="list-style-type: none"> I hardly notice my pain, and it does not interfere with my activities. I notice my pain and it distracts me, but I can still do activities (sitting up, walking, standing). 	<p>Non-medication therapies</p> <p>+</p> <p>Non-opioid, oral medications</p> <ul style="list-style-type: none"> Take as needed when you feel pain. These help to decrease pain and swelling (inflammation) 	<p><u>Non-medication Therapies</u></p> <ul style="list-style-type: none"> Ice, elevation, rest, meditation, massage, distraction (music, TV, play) walking and mild exercise Splinting the abdomen with pillows <p><u>Non-Opioid Medication</u></p> <ul style="list-style-type: none"> Acetaminophen (Tylenol®) Non-steroidal anti-inflammatory drugs (NSAIDS) Aspirin, Ibuprofen (Motrin®, Advil®) Naproxen (Aleve®)
<ul style="list-style-type: none"> My pain is hard to ignore and is more noticeable even when I rest. My pain interferes with my usual activities. 	<p>Non-Medication Therapy</p> <p>+</p> <p>Non-opioid, oral medication</p> <p>Take these on a regular schedule</p>	<p><u>Take Non-opioid medication</u> on a regular schedule instead of as needed. (Ex: Tylenol® every 6 hours at 9am, 3pm, 9pm, 3am and Motrin® every 6 hours and 12am, 6am, 12pm, 6pm)</p>
<ul style="list-style-type: none"> I am focused on my pain, and I am not doing my daily activities. I am groaning in pain, and I cannot sleep. I am unable to do anything. My pain is as bad as it could be, and nothing else matters. 	<p>Non-Medication Therapy</p> <p>+</p> <p>Non-opioid, oral medication</p> <ul style="list-style-type: none"> Take these on a regular schedule <p>Short-acting Opioids</p> <ul style="list-style-type: none"> Take for a few days and decrease/stop as soon as possible 	<p>Opioids block pain and give a feeling of euphoria (feel high). Addiction, a serious side effect of opioids, is rare with short term use.</p> <p>Examples of short-acting opioids include: Tramadol (Ultram®), Hydrocodone (Norco®, Vicodin®), Hydromorphone (Dilaudid®)</p>

More Information

GLOSSARY

Abdominal ultrasound: A handheld transducer, or probe, is used to project and receive sound waves to determine the location of deep structures in the body. A gel is wiped onto the patient's skin so that the sound waves are not distorted as they cross through the skin.

Advance directives: Documents signed by a competent person giving direction to health care providers about treatment choices. They give you the chance to tell your feelings about health care decisions.

Adhesions: A fibrous band or scar that causes internal organs to adhere or stick together.

Bile: A fluid produced by the liver and stored in the gallbladder which helps in the digestion of fats.

Biliary colic: Sudden pain in the abdomen caused by spasm or blockage of the cystic or bile duct lasting for more than 30 minutes.

Bilirubin: A yellow breakdown product of the red blood cells. High levels may indicate diseases of the liver or gall bladder.

Complete blood count (CBC): A CBC measures your red blood cells (RBCs) and white blood cells (WBCs). WBCs increase with inflammation. The normal range for WBCs is 5,000 to 10,000.

Endoscopic retrograde cholangiopancreatography (ERCP): A tube with a light and a camera on the end is passed through your mouth, stomach, and intestines to check for conditions of the bile ducts and main pancreatic duct and to remove gallstones.

Gallbladder: The gallbladder is a small pear-shaped organ under the liver. The liver makes 3 to 5 cups of bile every day which is stored in the gallbladder.

Gallstones (Cholelithiasis): Hardened deposits of digestive fluid that can form in your gallbladder.

Gallstone Pancreatitis: Gallstones can move to and block the common bile duct, the pancreatic duct or both.

Hepatobiliary iminodiacetic acid scan or gallbladder scintigraphy (HIDA): A scan that shows images of the liver, gallbladder, and bile ducts following injection of a dye into the veins.

Intraoperative cholangiogram: During surgery to remove the gallbladder (cholecystectomy), a small tube called a catheter is inserted into the cystic duct, which drains bile from the gallbladder to check for remaining gallstones.

Magnetic resonance cholangiopancreatography (MRCP): A medical imaging technique that uses magnetic resonance imaging to visualize the biliary and pancreatic ducts.

DISCLAIMER

This information is published to educate you about your specific surgical procedure. It is not intended to take the place of a discussion with a qualified surgeon who is familiar with your situation. It is important to remember that each individual is different, and the reasons and outcomes of any operation depend on the patient's individual condition.

The American College of Surgeons (ACS) is a scientific and educational organization that is dedicated to the ethical and competent practice of surgery. It was founded to raise the standards of surgical practice and to improve the quality of care for the surgical patient. The ACS has endeavored to present information for prospective surgical patients based on current scientific information; there is no warranty on the timeliness, accuracy, or usefulness of this content.

For more information on tests and procedures, please go to the National Institutes of Health website at www.nlm.nih.gov/medlineplus/encyclopedia.html.

**SURGICAL PATIENT
EDUCATION PROGRAM**
Prepare for the Best Recovery

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References

The information provided in this brochure is chosen from recent articles based on relevant clinical research or trends. The research listed below does not represent all of the information that is available about your procedure. Ask your doctor if he or she recommends that you read any additional research.

1. Gallstones. National Institute of Diabetes and Digestive and Kidney Diseases. <https://www.niddk.nih.gov/health-information/digestivediseases/gallstones?dkrd=hispt0204>. Accessed July 1, 2021.
2. Laparoscopic Cholecystectomy (Gallbladder Removal) <https://my.clevelandclinic.org/health/treatments/7017-laparoscopic-cholecystectomy-gallbladder-removal>. Accessed July 13, 2021.
3. Ibrahim M, Sarvepalli S, Morris-Stiff G, Rizk M, et al. Gallstones: Watch and wait, or intervene? *Cleve Clin J Med*. 2018 Apr; (4):323-331. doi: 10.3949/ccjm.85a.17035. PMID: 29634468.
4. Gallstones. <https://www.mayoclinic.org/diseases-conditions/gallstones/symptoms-causes/syc-20354214> Accessed July 27, 2021
5. American College of Surgeons. ACS Risk Calculator. <http://riskcalculator.facs.org>. Last accessed August 2021.
6. Diagnosis of Gallstones; How do Doctor's Diagnose Gallstones? <https://www.niddk.nih.gov/health-information/digestive-diseases/gallstones/diagnosis>. accessed July 27, 2021
7. Inah GB, Ekanem EE. Sonographic Diagnosis and Clinical Correlates of Gallbladder Stones in Patients with Sickle Cell Disease in Calabar, Nigeria. *Open Access Maced J Med Sci*. 2019;7(1):68-72. Published 2019 Jan 12. doi:10.3889/oamjms.2019.015
8. Poddighe D, Sazonov V. Acute acalculous cholecystitis in children. *World J Gastroenterol* 2018; 24(43): 4870-4879 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v24/i43/4870.htm> DOI:]<http://dx.doi.org/10.3748/wjg.v24.i43.4870>
9. Sugrue, M., Coccolini, F., Bucholc, M. et al. Intra-operative gallbladder scoring predicts conversion of laparoscopic to open cholecystectomy: a WSES prospective collaborative study. *World J Emerg Surg* 14, 12 (2019). <https://doi.org/10.1186/s13017-019-0230-9>]
10. Loozen C. S., van Santvoor H. C., van Geloven A. A. W., et al. Perioperative antibiotic prophylaxis in the treatment of acute cholecystitis (PEANUTS II trial): study protocol for a randomized controlled trial. *Trials*. 2017;18(1):p.390. doi: 10.1186/s13063-017-2142-x.]
11. Tanaja J, Lopez RA, Meer JM. Cholelithiasis. [Updated 2020 Dec 7]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK470440/>
12. Pandit N, Yadav TN, Awal L, et al. Current Scenario of Postcholecystectomy Bile Leak and Bile Duct Injury at a Tertiary Care Referral Centre of Nepal Minimally Invasive Surgery, 2020, 4382307 - April 2020 <https://doi.org/10.1155/2020/4382307>
13. Chiappetta P, Napoli E, Canullan C, et al. Minimally invasive management of acute biliary tract disease during pregnancy. *HPB Surg*. 2009;2009:829020. doi: 10.1155/2009/829020. Epub 2009 Jul 12.