Patient Education

Partners in Your Surgical Care

Cholecystectomy

Surgical Removal of the Gallbladder

American College of Surgeons
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Patient Education

This educational information is to help you be better informed about your operation and empower you with the skills and knowledge needed to actively participate in your care.

Keeping You Informed

Information that will help you further understand your operation.

Education is provided on:

Cholecystectomy Overview 1
Condition, Symptoms, Tests 2
Treatment Options 3
Risks and Possible Complications 4
Preparation and Expectations 5
Your Recovery and Discharge 6
Pain Control 7
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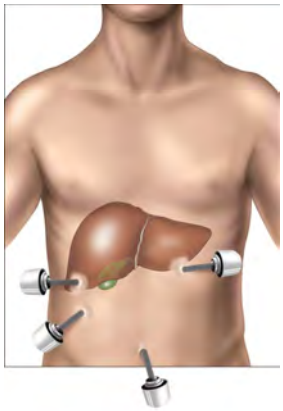
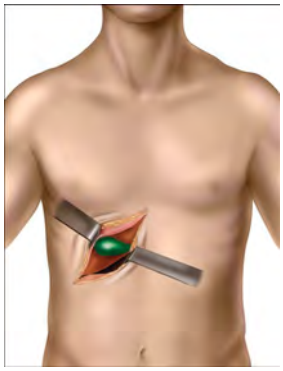
Laparoscopic versus Open Cholecystectomy

Laparoscopic Cholecystectomy



Open Cholecystectomy



The Condition

Cholecystectomy is the surgical removal of the gallbladder. The operation is done to remove gallstones or to remove an infected or inflamed gallbladder.

Common symptoms

- Sharp pain in the upper center or right abdomen
- Low fever
- Nausea and feeling bloated

Treatment Options

Surgery

Laparoscopic cholecystectomy—The gallbladder is removed with instruments placed into 4 small slits in the abdomen.

Open cholecystectomy—The gallbladder is removed through an incision on the right side under the rib cage.

Nonsurgical

- Stone retrieval

For gallstones without symptoms

- Watchful waiting
- Increased exercise
- Diet changes

Benefits and Risks

Benefits and Risk

Gallbladder removal will relieve pain, treat infection, and in most cases stop gallstones from coming back. The risks of not having surgery are the possibility of worsening symptoms, infection, or bursting of the gallbladder.

Possible complications include bleeding, bile duct injury, fever, liver injury, infection, numbness, raised scars, hernia at the incision, anesthesia complications, puncture of the intestine, and death.

Expectations

Before your operation—Evaluation usually includes blood work, an abdominal ultrasound, and an evaluation by your surgeon and anesthesia provider to review your health history and medications and to discuss pain control options.

The day of your operation—You will not eat or drink for at least 6 hours before the operation. Most often you will take your normal medication with a sip of water.

Your recovery—If you have no complications, you are often discharged home the same day after a laparoscopic procedure and in 2 to 3 days after an open procedure. Call your surgeon if you are in severe pain, have stomach cramping, a high fever or chills, your skin turns yellow, or there is odor and increased drainage from your incision.

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

The Condition, Signs and Symptoms, and Diagnostic Tests

Keeping You Informed

Most people with gallstones do not have symptoms. Eighty percent of people with gallstones go 20 years or longer without symptoms.[1,2]

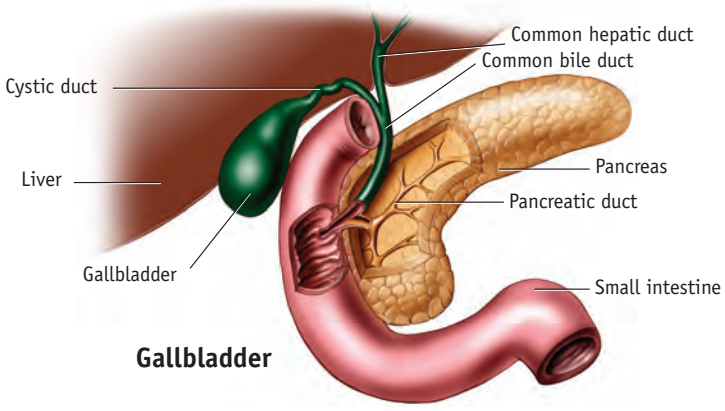
Gallstones are more common in people who:

- are Native American
- have a family history of gallstones
- are overweight
- eat a lot of sugar
- are pregnant
- do not exercise regularly
- lose weight rapidly
- use estrogen to manage menopause[3,4]

Gallbladder pain or biliary colic is usually temporary. It starts in the middle or right side of the abdomen and can last from 30 minutes to 24 hours. The pain may occur after eating a fatty meal.

- Acute cholecystitis pain lasts longer than 6 hours, and there is abdominal tenderness and fever.
- Pain on the right side of the abdomen can also be from ulcers, liver problems, and heart pain.

Standard treatment of acute cholecystitis is intravenous fluids, antibiotics, pain medication, and cholecystectomy.[5]



The Condition

The Gallbladder

The gallbladder is a small pear-shaped organ under the liver.

The liver makes about 3 to 5 cups of bile every day. Bile is stored in the gallbladder, and when food is eaten, especially fatty foods, the gallbladder squeezes bile out through the cystic duct and into the small intestine.

Gallstones

The medical term for gallstone formation is cholelithiasis. A gallstone in the common bile duct is called choledocholithiasis. Gallstones in the ducts can block the flow of bile and cause swelling of the gallbladder.

Cholecystitis is inflammation of the gallbladder, which can happen suddenly (acute) or over a longer period of time (chronic).

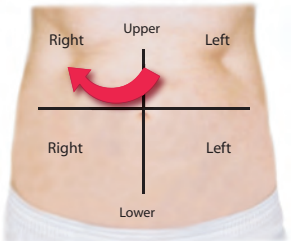
Perforated gallbladder is a condition when the gallbladder bursts or leaks, which happens only in rare cases but can be life threatening.

Cholecystectomy is the surgical removal of the gallbladder. The most common reason for a cholecystectomy is to remove gallstones that cause biliary colic (acute pain in the abdomen caused by spasm or blockage of the cystic or bile duct).

Symptoms

The most common symptoms of cholecystitis are:

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



Common Diagnostic Tests

History and Physical

Tests (see glossary)

Abdominal ultrasound

This is the most common test to check for gallstones. You may be asked not to eat for 8 hours before the test.

Blood tests

- Complete blood count
- Liver function tests
- Coagulation profile

HIDA scan, cholescintigraphy

Endoscopic retrograde cholangiogram

Magnetic resonance cholangiopancreatography

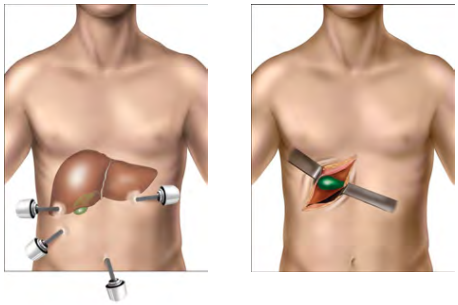
Surgical and Nonsurgical Treatment

Surgical Treatment

An operation is the recommended treatment for gallbladder pain from gallstones, and it is the only treatment for acute cholecystitis.

Laparoscopic versus Open Cholecystectomy

Laparoscopic Cholecystectomy | Open Cholecystectomy



Laparoscopic Cholecystectomy

This technique is the most common for simple cholecystectomy. The surgeon will make 4 small incisions in the abdomen. A port (nozzle) is inserted into one of the slits, and carbon dioxide gas inflates the abdomen. This process allows the surgeon to see the gallbladder more easily. A laparoscope is inserted through another port. It looks like a telescope with a light and video camera on the end so the surgeon can see inside the abdomen. Surgical instruments are placed into the other small openings and used to remove the gallbladder.

The surgeon removes the gallbladder through the incision. The carbon dioxide comes out through the small slits and then the sites are closed with sutures, metal clips called staples, or steri-strips. Your surgeon may start with a laparoscopic technique and need to change to an open technique.

The procedure takes about 1 to 2 hours.

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 the gallbladder. The gallbladder is removed, and any ducts are clamped off.

The site is stapled or sutured closed, and a small drain may be placed going from the inside to the outside of the abdomen. The drain is usually removed in the hospital. The procedure takes about 1 to 2 hours.

Procedure Options

Procedures may be done to remove gallstones from the common bile duct.

Laparoscopic transcystic common bile duct stone extraction is performed with insertion of instruments into the abdomen similar to laparoscopic cholecystectomy. The bile duct is entered, and stones are removed directly or with a wire basket.

Endoscopic retrograde cholangio-pancreatography is done by inserting an endoscope into your mouth and continuing to pass it through your stomach and then into the common bile duct. Gallstones are removed directly or with a balloon or basket.

Complication rates range from 0 to 9.1 per 1,000 procedures.[6]

Nonsurgical Treatment

Watchful waiting

If gallstones are seen on your ultrasound but you do not have symptoms, watchful waiting is recommended.[1,2]

Gallstones only, without cholecystitis

- Increase your exercise. Exercising 2 to 3 hours a week reduces the risk of gallstones.[7,8]
- Eat more fruit and vegetables, and eat less foods high in sugars and carbohydrates like donuts, pastry, and white bread.
- Alternative medicine options are available.[9]

Keeping You Informed

Conversion rates from a laparoscopic to an open technique are less than 1% for young healthy people.

- The need to convert from a laparoscopic to an open procedure can increase significantly if you are over 65 years, are male, have a history of acute cholecystitis, past abdominal operations, high fever, high bilirubin, repeated gallbladder attacks, and diseases that limit your activity.[5]

Questions you should ask

- What type of procedure is right for me and why?
- How much experience do you have with this procedure?
- Has the procedure been done often at this center?
- Do you know the approximate cost of the procedure?

Risks of This Procedure

Your surgeon will do everything possible to minimize risks, but cholecystectomy, like all operations, has risks.

The Risk	What Happens	Keeping You Informed
Infection	Infections occur in less than 1 per 1,000 patients who have laparoscopic procedures.[5,6,13,14]	Your health care team should wash their hands before examining you. Antibiotics are given right before the operation.[5]
Common bile duct injury	Injury to the bile duct is reported in 1 per 1,000 patients for open cholecystectomy and in 1 to 5 per 1,000 for laparoscopic cholecystectomy.[5,6,14]	Your surgeon and nurse will watch for jaundice, fever, and abnormal blood tests.[5] Further testing or surgery may be needed.
Bleeding	Bleeding is rare. If you have chronic biliary disease, your liver may not form clotting factors.[5,6,13]	Your surgeon will check a coagulation profile to monitor for bleeding problems. A blood transfusion usually is not required for cholecystectomy.
Bile leakage	Bile leakage after surgery is very rare.	Your surgeon will check for fever, monitor labs, and may need to perform other tests such as sonography or endoscopic retrograde cholangiopancreatography (ERCP).
Retained common bile duct stone	A gallstone may pass after surgery and block the bile from draining.[5]	Your surgeon will check blood tests for your liver function.
Pneumonia	General anesthesia, lack of deep breathing and movement are possible causes.	Deep breathing exercises can help expand your lungs and prevent complications after surgery.[10]
Heart problems	Heart problems are rare. Cardiac arrhythmias were reported in about 5 per 1,000 patients and heart attack in 1 per 1,000.[6,13]	Your surgeon may have you see a heart specialist before your operation. Your anesthesia provider is always prepared in advanced cardiac life support.
Kidney problems	Kidney or urinary problems have been reported in 5 per 1,000 patients. Dehydration and liver problems can increase this risk.[6,13]	Your surgeon may give you extra fluids before your operation.[5] Let your nurse know when you urinate.
Deep vein thrombosis (blood clots)	No movement during surgery can lead to blood clots forming in the legs. In rare cases the clot can travel to the lungs.	Your surgeon or nurse will place support or compression (squeezing) stockings on your legs and may give you blood thinning medication. Your job is to get up and walk after surgery.
Premature labor and fetal loss	Fetal loss is reported as 40 per 1,000 patients for uncomplicated cholecystectomy and as high as 600 per 1,000 when pancreatitis is present. The risk of preterm labor also increases.[11,12]	These risks increase with peritonitis (infection of the abdominal cavity).
Injury to the intestines or abdominal organs	Instrument insertion and use during laparoscopic technique can injure the intestines.	The surgeon will use extreme care and continuously watch for any bleeding or bowel contents during the procedure. Patients who are obese or who have a history of past abdominal operations or adhesions make it more difficult to move and manipulate instruments.[5]
Death	Death is extremely rare in healthy people and is reported as 0 to 1 per 1,000 patients. The risk of death increases with gangrene, a burst gallbladder or severe diseases that limit your activity.[1,6]	Your entire surgical team will review for possible complications and be prepared to decrease all risks.

Expectations: Preparation for Your Operation

Preparing for Your Operation

Tell your surgeon about other medical problems that you have. Bring a list of all of the medications that you are taking, and show that list to your surgeon and anesthesia provider.

Most often you will take your morning medication with a sip of water. If you are taking blood thinners (Plavix, coumadin, aspirin), your surgeon may ask you to stop taking these.

Home Preparation

You can often go home the same day after a laparoscopic procedure. Your hospital stay will be longer (2 to 3 days) for an open procedure.

Anesthesia

You will meet with your anesthesia provider before the operation. Let him or her know if you have allergies, neurologic disease (epilepsy or stroke), heart disease, stomach problems, lung disease (asthma, emphysema), endocrine disease (diabetes, thyroid conditions), loose teeth, or if you smoke, abuse alcohol or drugs, or take any herbs or vitamins.

The Day of Your Operation

Don't eat or drink

Not eating or drinking for at least 6 hours before the operation reduces your risk of complications from anesthesia.

What to bring

- Insurance card and identification
- Advance directive (see terms)
- List of medicines
- Personal items such as eyeglasses and dentures
- Loose-fitting comfortable clothes
- Leave jewelry and valuables at home

What You Can Expect

A bracelet with your name and identification number will be placed on your wrist. Your wristband should be checked by all health care team members before providing any procedures or giving you medication. If you have any allergies, an allergy bracelet should also be placed on your wrist.

An intravenous line (IV) will be started to give your fluids and medication. The medication will make you feel sleepy.

A tube will be placed down your throat to help you breathe during the operation.

Your surgeon will perform your operation and then close your incisions. If you have an open operation, a drain may be placed from the inside of your incision out your abdomen.

After your operation, you will be moved to a recovery room.

Preventing Pneumonia

Movement and deep breathing after your operation can help prevent fluid in your lungs and pneumonia.[10]

Preventing blood clots

When you have an operation, you are at risk of getting blood clots because of not moving during anesthesia. The longer and more complicated your operation, the greater the risk. Your doctor will know your risk for blood clots, and steps will be taken to prevent them. This may include blood thinning medication and support or compression (squeezing) stockings.

Preventing Infection

- The risk of infection can be lowered if antibiotics are given right before operation and hair is removed at the surgical site with clippers versus shaving.
- All health care providers should wash their hands before examining you.

Keeping You Informed

Questions you should ask

- What medications should I stop taking before my operation?
- When should I stop taking them?
- Should I take any medicines on the day of my operation?
- What are the risks, problems, and side effects of general anesthesia?
- Do I need antibiotics before surgery?
- What will you do to prevent blood clots?
- If hair has to be removed on my abdomen, how will it be done?
- Did you wash your hands?

Deep Breathing

An effective way to do deep breathing is to breathe deeply and hold for 3 to 5 seconds. Take 5 to 10 deep breaths every hour while you are awake. Young children can do deep breathing by blowing bubbles.

Your Recovery and Discharge

Avoid driving

Steri-strips will fall off or they will be removed during your first office visit

Wash your hands before and after touching near your incision site

Your Recovery and Discharge

Thinking Clearly

The anesthesia may cause you to feel different for 2 or 3 days. Do not drive, drink alcohol, or make any big decisions for at least 2 days.

Nutrition

- When you wake up, you will be able to drink small amounts of liquid. If you are not nauseous, you can begin eating regular foods.
- Continue to drink lots of fluids, usually about 8 to 10 glasses per day.

Activity

- You will be helped getting out of bed and walking.
- Slowly increase your activity.
- Do not lift or participate in strenuous activity for 3–5 days for laparoscopic and 10–14 days for open procedure.
- Avoid driving until your pain is under control without narcotics.
- You can have sex when you feel ready, usually after your sutures or staples are removed.
- It is normal to feel tired. You may need more sleep than usual.

Work

You can go back to work when you feel well enough. Discuss the timing with your surgeon.

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.
- Follow your surgeon's instructions on when to change your bandages.
- A small amount of drainage from the incision is normal. If the drainage is thick and yellow or the site is red, you may have an infection so call your surgeon.
- If you have a drain in one of your incisions, it will be taken out when the drainage stops.
- Surgical staples, will be removed during your first office visit.
- Steri-strips will fall off in 7 to 10 days or they will be removed during your first office visit.
- Avoid wearing tight or rough clothing. It may rub your incisions and make it harder for them to heal.
- Protect the new skin, especially from the sun. The sun can burn and cause darker scarring.
- Your scar will heal in about 4 to 6 weeks and will become softer and continue to fade over the next year. Keep the wound site out of the sun or use sunscreen.
- Sensation around your incision will return in a few weeks or months.

Bowel Movements

- After intestinal surgery, you may have loose watery stools for several days. If watery diarrhea lasts longer than 3 days, contact your surgeon.
- Pain medication (narcotics) can cause constipation. Increase the fiber in your diet with high-fiber foods if you are constipated. Your surgeon may also give you a prescription for a stool softener.

High-Fiber Foods

Food 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.

Pain

The amount of pain is different for each person. Some people need only 2 to 3 doses of pain control medication, while others use narcotics for a full week.

Home Medications

The medicine you need after your operation is usually related to pain control.

When to Contact Your Surgeon

If you have:

- Pain that will not go away
- Pain that gets worse
- A fever of more than 101°F (38.3°C)
- Vomiting
- Swelling, redness, bleeding, or bad-smelling drainage from your wound site
- Strong abdominal pain
- Jaundice or yellow skin
- No bowel movement or unable to pass gas for 3 days
- Watery diarrhea lasting longer than 3 days

Other Instructions:

Follow-up Appointments		
Who	**Date**	**Phone**

Pain Control

Everyone reacts to pain in a different way. A scale from 0 to 10 is often used to measure pain. At a "0," you do not feel any pain. A "10" is the worst pain you have ever felt.

Common Medicines to Control Pain

Narcotics or opioids are used for severe pain. Some side effects of narcotics are sleepiness; lowered blood pressure, heart rate, and breathing rate; skin rash and itching; constipation; nausea; and difficulty urinating. Some examples of narcotics include morphine, oxycodone, and hydromorphone. Medications are available to control many of the side effects of narcotics.

Non-narcotic Pain Medication

Most nonopioid pain medications are nonsteroidal anti-inflammatory drugs (NSAIDs). They are used to treat mild pain or combined with a narcotic to treat severe pain. They also can reduce inflammation. Some side effects of NSAIDs are stomach upset, bleeding in the stomach or intestines, and fluid retention. These side effects usually are not seen with short-term use. Examples of NSAIDs include ibuprofen and naproxen.

Non-medicine Pain Control

Distraction helps you focus on other activities instead of your pain. Music, games, and other engaging activities are especially helpful with children in mild pain.

Splinting your stomach by placing a pillow over your abdomen with firm pressure before coughing or movement can help reduce the pain.

Guided imagery helps you direct and control your emotions. Close your eyes and gently inhale and exhale. Picture yourself in the center of somewhere beautiful. Feel the beauty surrounding you and your emotions coming back to your control. You should feel calmer.

Keeping You Informed

Extreme pain puts extra stress on your body at a time when your body needs to focus on healing. Do not wait until your pain has reached a level "10" or is unbearable before telling your doctor or nurse. It is much easier to control pain before it becomes severe.

Laparoscopic Pain

Following a laparoscopic procedure, pain is sometimes felt in the shoulder. This is due to the gas inserted into your abdomen during the procedure. Moving and walking helps to decrease the gas and the right shoulder pain.[15]

Splinting your stomach

Guided imagery

Glossary of Terms and for More Information

Glossary of Terms

Abdominal ultrasound This test uses sound waves to determine the location of deep structures in the body. A hand roller is placed on top of clear gel and rolled across the abdomen.

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 tissue that causes internal organs to adhere or stick together.

Bilirubin A blood test used to determine liver and gallbladder dysfunction.

Complete blood count (CBC) A blood test that measures red blood cells (RBCs) and white blood cells (WBCs). WBCs increase with inflammation. The normal range for WBCs is 8,000 to 12,000.

Endoscopic retrograde cholangiogram An endoscope with a camera on the end is passed through your mouth, stomach, and intestines into the bile duct to check for and remove gallstones.

HIDA (hepatobiliary iminodiacetic acid scan) A scan that images the liver, gallbladder, and bile ducts following injection of radiolabeled dye into the veins.

Hernia A bulge through an abnormal opening in the abdominal wall.

Magnetic resonance cholangiopancreatography A scan that uses powerful magnets and radio waves to show pictures of the body.

For More Information

For more information, please go to the American College of Surgeons Patient Education Web site at *www.facs.org/patienteducation/*.

The information provided in this brochure is chosen from recent clinical research. The research listed below does not represent all of the information that is available about your operation.

1. Society for Surgery of the Alimentary Tract. Treatment of gallstones and gallbladder disease. (2003)
2. National Institutes of Health. Gallstones and laparscopic cholecystectomy. *NIH Consensus Statement* (1992)12:1–28
3. Nakeeb A, Cumuzzie AG, Martin L, et al. Gallstone: genetics versus environment. *Annals of Surgery* (2002)235:842–849
4. Weinsier RL, Wilson LJ, Lee J. Medically safe rate of weight loss for the treatment of obesity: a guideline based on risk of gallstone formation. *American Journal of Medicine* (1995)98:115–117
5. Souba W, Fink M, Jurkovich G, et al. *ACS Surgery: Principles and Practice*. New York, NY: WebMD, 2004
6. Petelin J. Laparoscopic common bile duct exploration. *Surgical Endoscopy* (2003)17: 1705–1715
7. Leitzmann MF, Giovannucci EL, Rimm EB, et al. The relation of physical activity to risk for symptomatic gallstone disease in men. *Annals of Internal Medicine* (1998)128:417–425
8. Leitzmann MF, Rimm EB, Willet WC, et al. Recreational physical activity and the risk of cholecystectomy in women. *New England Journal of Medicine* (1999)341:777–784
9. Moga MM. Alternative treatment of gallbladder disease. *Medical Hypothesis* (2003)60:143–147
10. Overend TJ, Anderson CM, Lucy SD, et al. The effect of incentive spirometry on post-operative complications. *Chest* (2001)120:971–978
11. Graham G, Baxi L, Tharakan T. Laparoscopic cholecystectomy during pregnancy: a case series and review of the literature. *Obstetrics and Gynecology Survival* (1998)53:566–574
12. Al-Fozan H, Tulandi T. Safety and risks of laparoscopy in pregnancy. *Current Opinion in Obstetrics and Gynecology* (2002)14:375–379
13. Khaitan L, Apelgren K, Hunter L, et al. A report on the Society of American Gastrointestinal Endoscopic Surgeons (SAGES) outcome intiative. *Surgical Endoscopy* (2003)17:365–370
14. Giger UF, Michel JM, Opitz I, et al. Risk factors for perioperative complications in patients undergoing laparoscopic cholecystectomy: analysis of 22,953 consecutive cases from the Swiss Association of Laparoscopic and Thoracoscopic Surgery database. *Journal of the American College of Surgeons* (2006)203:723–728
15. Jackson SA, Laurence AS, Hill JC. Does post laparoscopy pain relate to residual carbon dioxide? *Surgical Endoscopy* (2004)18:170

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