TEST

Percutaneous transhepatic cholangiogram

A percutaneous transhepatic cholangiogram uses contrast and X-rays to examine the bile ducts through the liver.

WHAT IT MEASURES
Bile duct anatomy, blockage, narrowing, and leakage

SAMPLE
None, because this is an imaging test

FASTING NEEDED?
Yes, usually for several hours before sedation

HOW LONG IT TAKES
About one to two hours, plus recovery

RESULTS IN
Usually same day; timing varies by laboratory or imaging service

USED FOR
Diagnosis, treatment planning, and guiding bile duct drainage

MAIN LIMITATION
Incomplete contrast filling can hide parts of the bile ducts

Overview

A percutaneous transhepatic cholangiogram, or PTC, is an imaging test of the bile ducts. These small tubes carry bile from the liver and gallbladder into the small intestine. Bile helps the body digest fats.

During PTC, a radiologist passes a thin needle through the skin and liver into a bile duct. Contrast dye is injected, and real-time X-rays called fluoroscopy show how the contrast moves through the ducts.

PTC can locate a blockage, narrowing, or bile leak. It may also provide access for treatment. For example, the radiologist may place a drainage tube or a stent, which is a small tube that holds a narrowed duct open.

This is an invasive test rather than a routine screening test. Ultrasound, CT, or magnetic resonance cholangiopancreatography, known as MRCP, is often used first because these tests do not require a needle to enter the liver.

Why the test is ordered

PTC may be ordered when other imaging suggests that bile cannot drain normally. Possible reasons include a stone, scarring, inflammation, a surgical injury, or pressure from a growth. The test can show where the problem is, but it may not identify its exact cause.

Your care team may use PTC to:

An endoscopic retrograde cholangiopancreatogram, or ERCP, reaches the bile ducts through the mouth and digestive tract. PTC approaches them through the skin and liver. PTC may be chosen when altered anatomy from previous surgery makes ERCP difficult or when a blockage cannot be crossed from below.

- Find the location and extent of a bile duct blockage
- Examine a suspected bile leak after surgery or injury
- Map the ducts before drainage, stent placement, or surgery
- Investigate abnormal bile duct findings seen on other scans
- Obtain access when endoscopic treatment is unsuccessful or unsuitable

Who should have the test

PTC is considered when detailed bile duct imaging or direct access to the ducts is needed. It is not used to screen people without a specific clinical reason.

The decision is based on your symptoms, blood test results, previous imaging, anatomy, and the treatment that may be needed. PTC may be recommended for jaundice, a bile leak, or signs that a blocked duct requires drainage.

Some conditions can increase the risks. These include a bleeding problem, a low platelet count, significant fluid around the liver, or an active infection. These issues do not always rule out the procedure, but they may need treatment or additional planning first.

Tell the radiology team if you are or could be pregnant. X-rays are used, so the team will weigh the reason for the procedure against possible radiation exposure.

How to prepare

Follow the instructions from your radiology department. Preparation can change depending on whether you will have moderate sedation or a general anesthetic.

You will usually need to stop eating for several hours beforehand. Instructions about water and other clear liquids vary, so use the times provided by your facility rather than assuming that all liquids are allowed.

Tell the team about all medicines and supplements you take. This is especially important for blood thinners like warfarin or apixaban , antiplatelet medicines, and medicines for diabetes. Do not stop a prescribed medicine unless the team responsible for the procedure tells you to.

Before PTC, you may have blood tests to check:

Report previous reactions to contrast dye, antibiotics like amoxicillin or doxycycline , anesthetics, or adhesive dressings. Kidney problems can influence how contrast is used, although PTC usually places contrast directly into the bile ducts rather than into a vein.

Arrange for someone to take you home if sedation or anesthesia is planned. You should not drive afterward.

- How well your blood clots
- Your platelet count, which affects clotting
- Liver and kidney function

What happens during the test

You will change into a gown and usually have an intravenous line placed. The team may give sedation to help you relax. General anesthesia is used in some situations.

You lie on an X-ray table, often on your back. Monitoring equipment checks your pulse, blood pressure, breathing, and oxygen level. The skin over the upper abdomen or lower chest is cleaned, covered with sterile drapes, and numbed with local anesthetic.

Using ultrasound and X-ray guidance, the radiologist passes a fine needle through the skin and liver into a bile duct. You may be asked to hold your breath briefly while the needle is positioned.

Contrast is injected through the needle. The radiologist watches its movement through the ducts and records images. You may feel pressure or brief discomfort during the injection.

If the procedure is diagnostic only, the needle may then be removed. If drainage is needed, a guidewire and catheter may be placed. A stent or tissue-sampling device may also be used when planned.

The imaging commonly takes about one to two hours, although complex treatment takes longer. Afterward, you will be monitored in a recovery area. Some people need an overnight hospital stay, particularly when a drain has been placed.

Understanding your results

The report describes whether contrast flows through the bile ducts and into the small intestine. It also records the shape and width of the ducts.

Findings may include:

A blockage seen on PTC does not always reveal what caused it. CT, MRI, endoscopy, blood tests, or a tissue sample may be needed to distinguish among stones, scarring, inflammation, and a growth.

There is no single numerical reference range for PTC. Interpretation varies with your anatomy, age, previous operations, pregnancy status, medicines, other imaging, and clinical context.

- A narrowed or completely blocked duct
- Widened ducts above a blockage
- A stone or filling defect inside a duct
- Contrast leaking outside the bile ducts
- Irregular or altered ducts after surgery
- The position and function of a drain or stent

What affects the results

PTC images depend on contrast reaching and filling the ducts. A complete blockage can prevent contrast from showing ducts on the other side of the obstruction. If only one part of the biliary system is entered, another isolated section may not be seen.

Ducts that are not enlarged can be more difficult to enter. Breathing or body movement may also limit image quality.

Recent surgery, a previous drainage procedure, or an existing stent can change the appearance of the ducts. Air bubbles, blood clots, thick bile, or debris can create filling defects that resemble stones. Temporary tightening of a duct can sometimes look like a fixed narrowing.

A drain already in place may reduce duct swelling, so current images may look different from earlier scans. The radiologist interprets the findings alongside previous imaging and the timing of any procedures.

Blood-thinning medicines do not usually change the images, but they can increase bleeding risk. Kidney function and pregnancy mainly affect procedural planning and safety rather than

the appearance of the bile ducts.

Accuracy and limitations

PTC provides detailed, direct images and can show the level of a blockage or leak. It is especially useful when access is needed for drainage or another procedure.

The test can miss an abnormality if the relevant duct cannot be entered or does not fill with contrast. An unsuccessful attempt to reach a duct is inconclusive; it does not prove that the ducts are normal.

PTC can also suggest a problem that is not permanent. Air, a clot, debris, or temporary duct spasm may resemble a stone or narrowing. Additional images or another test may be needed before the cause is clear.

Ultrasound, CT, and MRCP are usually better for assessing surrounding organs and possible causes outside the duct. ERCP may be preferable when the ducts can be reached through the digestive tract and endoscopic treatment is planned. A biopsy or brushing may be needed if identifying the type of tissue is important.

Risks and complications

Soreness and a small bruise at the puncture site are common. Sedation can cause temporary drowsiness, nausea, or slowed breathing, which is why you are monitored.

More important complications include bleeding within or around the liver, infection in the bile ducts or bloodstream, and bile leaking into the abdomen. Contrast reactions and injury to a nearby organ are uncommon but possible. A puncture near the chest can rarely allow air or fluid to collect around a lung.

If a drainage catheter is left in place, it can become blocked, leak, or move out of position. You will receive instructions about the dressing, drainage bag, and when to ask for help.

What happens next

The radiologist may discuss the main findings soon after the procedure. A written report is sent to the clinician who ordered it.

Mild soreness and tiredness can be expected during routine recovery. Follow the instructions about activity, bathing, eating, medicines, and drain care. Avoid strenuous activity for the

period specified by your procedure team.

Contact your healthcare service promptly if a drain stops working, moves, leaks around the skin, or if pain is increasing rather than improving.

Seek urgent medical care for fever with shaking chills, severe or worsening abdominal or chest pain, trouble breathing, fainting, confusion, heavy bleeding, or rapidly increasing swelling around the puncture site. These are not routine recovery symptoms.

Common questions

Can I drink coffee before a PTC?

Usually not during the fasting period, even if it is black. Follow your department's instructions because sedation and anesthesia rules differ.

Does the time of day matter?

The images are not normally affected by the time of day. Appointment timing may change when you must stop eating and drinking.

Can I exercise beforehand?

Ordinary activity does not usually affect the images. Avoid arriving dehydrated or exhausted, and ask about restrictions if you are unwell.

Will I be awake?

Many people receive local anesthetic and sedation, so they are relaxed but not fully unconscious. General anesthesia may be used for longer or more complex procedures.

Is PTC the same as ERCP?

No. PTC reaches the bile ducts through the skin and liver. ERCP reaches them through the mouth, stomach, and small intestine.

Can I drive home afterward?

Not if you have received sedation or a general anesthetic. Arrange for a responsible adult to take you home and follow local supervision instructions.

Sources

- RadiologyInfo.org: Biliary Interventions , American College of Radiology and Radiological Society of North America

- CIRSE Patient Information: Biliary Drainage and Stenting , Cardiovascular and Interventional Radiological Society of Europe
- Percutaneous Transhepatic Cholangiography , StatPearls, National Center for Biotechnology Information
- CIRSE Standards of Practice on Percutaneous Transhepatic Cholangiography, Biliary Drainage and Stenting , Cardiovascular and Interventional Radiology , 2021
- British Society of Interventional Radiology: Biliary Drainage , patient information on percutaneous biliary procedures