HEALTH BASICS

# Biliary system

The biliary system makes, stores, and carries bile from your liver to your small intestine.

**WHAT IT IS**
Organs and tubes that make, store, and carry bile

**WHERE IT COMES UP**
Abdominal scans, blood tests, gallstones, and digestive symptoms

**WHY IT MATTERS**
Helps digest fats and remove certain waste products

**WHAT IT IS NOT**
Not a disease or diagnosis

**WHO TO ASK**
Primary care, gastroenterology, surgery, or radiology services

**HOW IT IS CHECKED**
Blood tests and imaging, usually starting with ultrasound

## Overview

The biliary system is the network that makes, stores, and moves bile . Bile is a yellow-green digestive fluid made by your liver. It helps your body digest fats and absorb the fat-soluble vitamins A, D, E, and K.

The system includes:

The biliary system is not a disease or diagnosis. You may hear about it when discussing abdominal pain, jaundice, gallstones, blood test results, or an imaging report.

"Biliary" simply means related to bile or the tubes that carry it. For example, "biliary obstruction" means something is blocking bile flow.

- The liver, which makes bile
- Small bile ducts inside the liver
- Larger bile ducts outside the liver
- The gallbladder, which stores and concentrates bile
- The common bile duct, which carries bile to the small intestine

## How it works

Your liver makes bile continuously. Bile contains water, bile salts, cholesterol, bilirubin, and other substances.

Bile salts help break large fat droplets into smaller ones. This allows digestive enzymes to work more effectively. Many bile salts are later absorbed from the intestine and returned to the liver for reuse.

Bilirubin is a yellow pigment made when the body breaks down old red blood cells. The liver processes bilirubin and releases it into bile. It eventually leaves the body mainly through stool, helping give stool its brown colour.

Bile begins its journey in tiny channels between liver cells. These channels join to form larger ducts within the liver. The ducts leaving the right and left sides of the liver combine to form the common hepatic duct .

The gallbladder is a small, pear-shaped organ beneath the liver. A side branch called the cystic duct connects it to the main bile duct. Between meals, much of the bile made by the liver is stored in the gallbladder, where water is removed and the bile becomes more concentrated.

When food, especially food containing fat, reaches the small intestine, signals cause the gallbladder to contract. Bile flows through the cystic duct and into the common bile duct .

The common bile duct opens into the first part of the small intestine, called the duodenum. Its opening is controlled by a ring of muscle known as the sphincter of Oddi . The pancreatic duct often opens in the same area, so conditions near this opening can affect both bile flow and the pancreas.

A person can live without a gallbladder. After gallbladder removal, the liver still makes bile, but bile flows more continuously into the intestine instead of being stored between meals.

## Why it matters for your health

Bile must be able to move from the liver into the intestine. If this flow slows or becomes blocked, bilirubin and other bile components can build up in the blood.

This may lead to jaundice , meaning yellowing of the skin or whites of the eyes. It can also cause dark urine, pale stool, or itching. These findings can have several causes and do not always come from the biliary system.

Biliary problems may affect digestion, especially when bile flow is reduced for a long time. A major reduction in bile reaching the intestine can make it harder to absorb fats and fat-soluble

vitamins. Stool may become pale, greasy, difficult to flush, or unusually foul-smelling.

Blood tests associated with the biliary system include bilirubin, alkaline phosphatase, and gamma-glutamyl transferase, often called GGT. Other liver tests may also change. A single abnormal result does not show exactly where the problem is or what caused it.

Ultrasound is often the first imaging test used to examine the gallbladder and bile ducts. Depending on the question, further testing may include:

ERCP is usually used when treatment may be needed, such as removing a stone or placing a small tube called a stent. It is more invasive than ultrasound or MRCP.

- MRCP , a special MRI that creates images of the bile and pancreatic ducts
- CT , which provides cross-sectional images of the abdomen
- HIDA scan , which follows a small amount of radioactive tracer through bile flow
- Endoscopic ultrasound , which uses an ultrasound probe passed through the mouth
- ERCP , an endoscopic procedure that can find and treat some duct blockages

## What can go wrong

Several different conditions can involve the biliary system.

Gallstones are hardened deposits that usually form in the gallbladder. Many cause no problems. A stone that temporarily blocks the gallbladder outlet may cause biliary colic, typically a steady pain in the upper abdomen.

Cholecystitis is inflammation of the gallbladder, often caused by a stone blocking the cystic duct. It may cause persistent upper-right abdominal pain, tenderness, fever, nausea, or vomiting.

Choledocholithiasis means a gallstone is in the common bile duct. It can block bile flow and may lead to jaundice, infection, or inflammation of the pancreas.

Cholangitis is an infection of the bile ducts, usually occurring when a duct is blocked. It can become serious and needs prompt medical treatment.

Pancreatitis is inflammation of the pancreas. A gallstone passing through the shared drainage area can sometimes trigger it.

Bile duct strictures are narrowed areas within a duct. They may follow inflammation, surgery, injury, or other disease. Tumours of the pancreas, gallbladder, liver, or bile ducts can also obstruct bile flow.

Some immune-related conditions damage the ducts. Primary biliary cholangitis mainly affects

small ducts within the liver. Primary sclerosing cholangitis causes inflammation and scarring in ducts inside or outside the liver.

In infants, biliary atresia is a rare condition in which bile ducts are blocked or do not develop normally. It is different from the biliary conditions usually seen in adults.

## What you can do

There is nothing you need to do to monitor a normal biliary system. Routine screening is not generally performed just to check bile flow in someone without a relevant finding or concern.

If a blood test or scan mentions the gallbladder or bile ducts, useful questions include:

Keep a record of previous abdominal scans, liver blood test results, and operations involving the liver, gallbladder, pancreas, or stomach. Tell the clinician arranging an MRI or procedure about implants, allergies, pregnancy, and medicines that affect bleeding.

An incidental finding, such as gallstones without symptoms, may only need routine follow-up or no treatment. The appropriate next step is based on the scan findings, blood results, symptoms, and medical history.

Seek urgent medical assessment for new jaundice, persistent upper abdominal pain, repeated vomiting, fever, or pale stool with dark urine.

Seek emergency help for severe or rapidly worsening abdominal pain accompanied by fever or jaundice, or for confusion, fainting, severe weakness, or difficulty staying awake. These combinations can occur with a serious infection or blockage.

- Which structure looked abnormal?
- Is bile flow blocked, or is the finding incidental?
- Do I need repeat blood tests or another type of imaging?
- Could a medicine, recent procedure, or existing condition affect this result?
- What symptoms should lead me to seek urgent care?

## Common questions

Is the biliary system the same as the gallbladder?

No. The gallbladder is one part of the biliary system. The liver and bile ducts are also part of it.

Is bile the same as stomach acid?

No. Bile is made by the liver and helps with fat digestion in the small intestine. Stomach acid is made in the stomach and helps break down food there.

Does a dilated bile duct mean it is blocked?

Not always. "Dilated" means wider than expected. It may occur with a blockage, but duct size can also be influenced by age, previous gallbladder removal, and individual anatomy. The result needs to be interpreted with symptoms, blood tests, and other images.

Can gallstones be seen on every scan?

No. Ultrasound detects many gallbladder stones, but some stones or duct problems may be difficult to see. MRCP, endoscopic ultrasound, CT, or ERCP may be considered when the clinical question remains unresolved.

Can the liver still make bile after gallbladder removal?

Yes. The liver continues to make bile. The difference is that bile is no longer stored and concentrated in the gallbladder.

What does "intrahepatic" or "extrahepatic" mean?

Intrahepatic means inside the liver. Extrahepatic means outside the liver. Imaging reports use these words to describe where a bile duct or finding is located.

## Sources

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