TEST

Gallbladder radionuclide scan

A gallbladder radionuclide scan tracks bile flow to check the gallbladder and bile ducts

WHAT IT MEASURES
Radiotracer flow through the liver, gallbladder, bile ducts, and bowel

SAMPLE
None; imaging test

FASTING NEEDED?
Yes, usually for several hours before imaging

HOW LONG IT TAKES
Usually 1-2 hours; sometimes up to 4 hours

RESULTS IN
Often 1-2 days; laboratory or imaging-service turnaround varies

USED FOR
Diagnosis and gallbladder function assessment

MAIN LIMITATION
Fasting, opioids, or severe illness can mimic blockage

Overview

A gallbladder radionuclide scan is a nuclear medicine imaging test, often called a HIDA scan or hepatobiliary scan.

The test follows a small amount of radioactive tracer as it moves from your blood into your liver, bile ducts, gallbladder, and small bowel. A special camera detects the tracer and creates images over time, showing whether bile is moving normally.

Some scans also measure how well the gallbladder empties. You may receive a medicine called sincalide, which acts like the digestive hormone cholecystokinin, or CCK. Some centers use a fatty drink or meal instead.

Why the test is ordered

The test investigates suspected problems with bile flow or gallbladder function. Reasons may include:

Ultrasound is often the first test for upper abdominal pain because it can show gallstones and

gallbladder structure. A radionuclide scan provides different information by showing how bile moves and whether the gallbladder fills and empties.

- Checking for acute gallbladder inflammation
- Looking for blockage of the cystic duct
- Measuring how much bile the gallbladder releases
- Checking for a bile leak after surgery or injury
- Assessing bile flow when ultrasound findings are unclear
- Evaluating problems after gallbladder, liver, or bile-duct surgery

Who should have the test

You may be offered this test if your symptoms, examination, blood tests, or other imaging suggest a gallbladder or bile-flow problem. It may be particularly useful when ultrasound does not fully explain your symptoms or when a bile leak is suspected after surgery.

The test may need to be postponed or adapted during pregnancy. Tell the imaging team if you are pregnant, could be pregnant, or are breastfeeding. They can assess whether the test is appropriate and provide specific breastfeeding instructions.

How to prepare

Follow the imaging center's instructions because preparation affects the result. You will usually need to avoid food for several hours. Water may be allowed, but policies vary.

Eating shortly before the scan can make the gallbladder contract, preventing it from filling with tracer. Fasting for too long can also prevent normal filling. Tell the team if you have not eaten for a full day, receive nutrition through a vein, or have been seriously unwell.

Provide a complete list of medicines and supplements. Opioid pain medicines can slow bile flow and make the scan harder to interpret. Do not stop prescribed medicine unless the team responsible for the test tells you how to manage it.

If you have diabetes or another condition that makes fasting difficult, ask for individualized instructions before your appointment.

What happens during the test

A healthcare professional places an intravenous line, or IV, into a vein in your arm or hand and injects the radioactive tracer.

You lie on an imaging table while a gamma camera is positioned over your abdomen. The camera records radiation coming from the tracer inside your body. You need to remain reasonably still while images are taken.

If the gallbladder does not appear within the expected period, imaging may continue for longer. In some cases, you may receive morphine to help distinguish a blocked cystic duct from slow gallbladder filling.

For a gallbladder emptying study, you may receive sincalide or a fatty drink or meal. Further images measure the percentage of tracer released from the gallbladder, called the gallbladder ejection fraction.

Understanding your results

A nuclear medicine specialist or radiologist reviews how quickly the tracer reaches each part of the biliary system. The report may describe whether:

Failure of the gallbladder to fill during a properly performed study can support acute cystic duct obstruction. However, the finding must be considered alongside your symptoms, blood tests, ultrasound, medicines, and fasting history.

If an ejection fraction is reported, the cutoff depends on the medicine or meal used, how it was given, scan timing, and the center's validated method. A low result does not establish a diagnosis by itself.

- The liver takes up the tracer normally
- The gallbladder becomes visible
- Tracer reaches the small bowel
- Bile flow is delayed or blocked
- Tracer appears outside the expected ducts, suggesting a leak
- The gallbladder empties normally after stimulation

What affects the results

Factors that can alter tracer movement include:

Previous gallbladder, stomach, liver, or bile-duct surgery may also change the expected

appearance.

- Eating too recently: The gallbladder may already have emptied
- Prolonged fasting: Thick, unmoving bile may prevent the gallbladder from appearing
- Opioid medicines: These can delay tracer movement
- Severe illness: Infection, major surgery, or hospitalization can change gallbladder function
- Liver dysfunction or high bilirubin: These can delay uptake and excretion of the tracer
- Nutrition through a vein: Long-term intravenous nutrition can reduce normal emptying
- Movement: Changing position can blur images
- IV leakage: Tracer leaking around the IV can reduce the amount reaching the liver

Accuracy and limitations

With appropriate preparation and imaging technique, the scan is generally good at identifying cystic duct blockage associated with acute gallbladder inflammation. False-positive results can occur after prolonged fasting, during severe illness, with chronic gallbladder disease, or after certain medicines.

The test can also miss a problem if surgery has changed the anatomy, tracer movement is very delayed, or imaging is limited by movement or poor liver function.

Gallbladder ejection fraction is less clear-cut than checking whether the gallbladder fills. Different methods can produce different numbers, and a reduced result does not prove that the gallbladder is causing symptoms.

Ultrasound is usually better for finding gallstones. CT can assess other causes of abdominal pain, while MRI of the bile ducts, called MRCP, can provide detailed anatomy without ionizing radiation.

Risks and complications

The IV may cause brief discomfort, bruising, or lightheadedness. Serious reactions to the tracer are rare.

Radiation exposure is limited but not zero. Sincalide can temporarily cause nausea or abdominal cramping. If morphine is used, the team will monitor you for effects such as sleepiness, nausea, or slowed breathing.

What happens next

Most people can return to their usual activities after the scan. Drinking fluids and passing urine regularly helps remove the tracer unless you have been told to limit fluids.

Your result is considered alongside your symptoms, examination, blood tests, and other imaging. Follow-up may involve observation, medicines, another test, or a surgical opinion.

Do not wait for a routine results appointment if you develop severe or rapidly worsening upper abdominal pain, repeated vomiting, fever with abdominal pain, yellow skin or eyes, fainting, confusion, or difficulty breathing. Seek urgent medical assessment. Call emergency services for severe breathing difficulty, collapse, or another immediately life-threatening symptom.

Common questions

Can I drink coffee before the scan?

Usually not during the fasting period. Coffee, particularly with milk, cream, or sugar, may stimulate the gallbladder. Follow your center's instructions about water and clear liquids.

Does the time of day matter?

Not usually. The length and timing of fasting matter more than whether the scan is in the morning or afternoon.

Can I exercise beforehand?

Normal activity is unlikely to affect the result. Avoid strenuous exercise if it makes fasting difficult or if your imaging center advises against it.

Can I take my medicines?

Many medicines can be taken as usual, but opioids and some medicines affecting digestion may alter bile flow. Give the team a complete medication list and do not stop medicines without instructions.

Will I feel the radioactive tracer?

Most people do not feel it moving through the body. You may notice the IV injection. Sincalide or morphine can cause temporary symptoms.

Can I drive home afterward?

Usually, yes. If you receive morphine or another medicine that causes drowsiness, you may need someone else to drive you. The imaging team will advise you before you leave.

Sources

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