TEST

Upper GI and small bowel series

An upper GI and small bowel series uses X-rays and swallowed contrast to examine the upper digestive tract.

WHAT IT MEASURES
Shape and movement of the upper digestive tract

SAMPLE
None; X-ray imaging with swallowed contrast

FASTING NEEDED?
Yes, usually for several hours before the examination

HOW LONG IT TAKES
Usually 2-6 hours; slow transit may take longer

RESULTS IN
Same day to several days; varies by laboratory or center

USED FOR
Diagnosing and following structural or movement problems

MAIN LIMITATION
Small or subtle lining abnormalities may be missed

Overview

An upper gastrointestinal, or upper GI, series is an imaging test of the esophagus, stomach, and first part of the small bowel. The esophagus is the tube that carries food from your mouth to your stomach.

When the rest of the small intestine is also examined, the test is called an upper GI and small bowel series or small bowel follow-through.

You swallow a contrast liquid, usually containing barium. Barium coats the inside of the digestive tract so it appears clearly on X-rays. It is not radioactive and is not absorbed into the bloodstream in meaningful amounts.

A radiologist watches the contrast move using fluoroscopy. Fluoroscopy produces moving X-ray images in real time. Additional still images are taken as the contrast travels through the small bowel.

This test does not require a camera to be passed down your throat. It also does not usually require sedation.

Why the test is ordered

The test shows the shape, position, and movement of the upper digestive tract. It may help identify:

It may be ordered for symptoms such as persistent swallowing difficulty, repeated vomiting, unexplained upper abdominal discomfort, or suspected narrowing of the small bowel.

Other tests may be more suitable for some questions. For example, endoscopy can provide a direct view of the lining and collect a tissue sample. CT or MRI may show the bowel wall and surrounding tissues more clearly.

- Narrowed or blocked areas
- Ulcers or abnormal pouches
- Hiatal hernia, where part of the stomach moves above the diaphragm
- Problems with swallowing or movement through the digestive tract
- Changes caused by previous surgery
- Some tumors, polyps, or areas of inflammation
- Abnormal connections between sections of bowel, called fistulas

Who should have the test

A healthcare professional may recommend this examination when symptoms or earlier tests suggest a structural or movement problem in the upper digestive tract or small bowel.

It may also be used to check known narrowing, follow changes after surgery, or investigate why food or contrast is moving unusually slowly.

The test is not generally used as routine screening in people without symptoms or a specific clinical reason.

Tell the imaging team if you are pregnant or could be pregnant. X-rays use ionizing radiation, so the team may postpone the test, adjust it, or recommend another type of imaging.

Also tell them if you have:

These details help the radiology team choose the safest contrast and preparation.

- Trouble swallowing or a history of inhaling food or liquid
- A possible hole in the digestive tract, called a perforation

- Severe constipation or a known bowel blockage
- Recent digestive tract surgery
- Diabetes or medicines that must be taken with food

How to prepare

Follow the instructions from your imaging center. Preparation can differ according to the planned images, appointment time, age, medicines, and medical history.

You will usually need to stop eating and drinking for several hours beforehand. An empty stomach makes the organs easier to see and lowers the chance that food will be mistaken for an abnormality. Do not chew gum, smoke, or suck sweets unless your instructions say they are allowed, because these can increase stomach secretions and movement.

Ask how to handle your usual medicines. Some can be taken with a small sip of water, while others may need different timing. Do not stop a prescribed medicine unless you have been given clear instructions.

Wear comfortable clothing and leave jewelry at home if possible. You may need to remove metal objects and change into a gown.

Plan for a longer visit than a standard X-ray. Small bowel transit can be slow, so the examination may take several hours. Consider bringing something to read between images.

What happens during the test

The radiographer may first take a plain X-ray of your abdomen. You will then drink barium contrast, which is usually thick, pale, and chalky.

For part of the examination, you may stand against an upright X-ray table. The table can then tilt until you are lying down. You will be asked to turn into different positions so the barium coats the digestive tract.

You may also be given gas-producing crystals. These expand the stomach to improve the view. If so, you may be asked to avoid burping for a short time.

The radiologist watches the contrast move through your esophagus, stomach, and duodenum, which is the first part of the small bowel. Gentle pressure may be applied over your abdomen to separate bowel loops or improve the images.

For the small bowel series, X-rays are taken at intervals as the barium moves farther through

the intestine. You may wait outside the imaging room between pictures. The examination usually ends when contrast reaches the large bowel.

The test should not be painful, although the barium may feel unpleasant to drink and positioning may be uncomfortable.

Understanding your results

A radiologist examines the images and prepares a report. The report may describe whether the digestive tract has a usual shape and whether contrast moves through it normally.

Possible findings include narrowing, delayed movement, abnormal widening, ulcers, hernias, masses, inflammation, or signs of a blockage. A result may also be described as incomplete if the contrast did not reach the required area or if an area could not be seen clearly.

There is no single numerical reference range for this test. Interpretation varies with the imaging center, age, sex, pregnancy status, medicines, previous surgery, and clinical context.

An abnormal image does not always identify the cause. Further imaging, endoscopy, or a biopsy may be needed before a diagnosis can be made.

What affects the results

Several factors can make images incomplete or misleading even when the equipment is working correctly.

Food or liquid remaining in the stomach may hide the lining or resemble an abnormality. Smoking, chewing gum, and some medicines can change digestive movement or stomach secretions.

Medicines that speed or slow the bowel may alter how quickly contrast travels. These include some opioid pain medicines, anticholinergic medicines, laxatives, and medicines used to affect bowel movement. Do not change them without specific instructions.

Other factors include:

Reflux can occur intermittently. If it does not happen during the short period of fluoroscopy, the test may not show it even if it occurs at other times.

- Very slow or very fast movement of contrast
- Bowel loops overlapping one another
- Difficulty swallowing enough contrast

- Vomiting during the examination
- Difficulty changing position or holding still
- Scar tissue or altered anatomy after surgery
- Stool or retained material obscuring parts of the bowel

Accuracy and limitations

An upper GI and small bowel series is useful for showing the outline of the digestive tract and how contrast moves through it. It can identify many larger narrowings, obstructions, hernias, and changes in shape.

It can miss small ulcers, flat growths, subtle inflammation, and abnormalities hidden by overlapping bowel loops. A problem that comes and goes may not be present while images are being taken.

The test can also suggest a problem that is not truly present. Normal bowel folds, muscle spasms, retained food, or changes from previous surgery may resemble narrowing or a mass.

Accuracy is not described by one reliable percentage because it differs according to the condition being investigated, imaging technique, bowel preparation, and experience of the interpreting team.

Endoscopy is often better for examining the surface lining and taking a biopsy. CT or MR enterography may be better for showing inflammation within the bowel wall or disease outside the bowel. CT is often preferred when urgent imaging is needed for suspected obstruction or perforation.

Risks and complications

The test uses ionizing radiation. The dose differs with the number of images, examination length, body size, and equipment. The imaging team aims to use the lowest amount needed for useful images.

Barium commonly causes pale or white stools for a short time. It can also cause constipation. Drinking fluids afterward may help if you have not been told to restrict fluids.

Rarely, hardened barium can contribute to a blockage, particularly in someone with severe constipation or an existing narrowing. Barium entering the airway can also cause complications, especially in people with major swallowing problems.

If a perforation is suspected, the team may use a water-soluble contrast instead of barium. That contrast has its own risks and imaging limitations.

What happens next

You can usually return to normal activities and eating after the examination unless you receive different instructions. Drink fluids and follow any advice about laxatives.

Your stools may look white or unusually pale while the barium leaves your body. This is an expected short-term effect.

Arrange routine follow-up to discuss the report, especially if it recommends endoscopy, CT, MRI, or another test. The next step depends on the finding and the reason the examination was requested.

Seek prompt medical advice if you develop worsening constipation, increasing abdominal discomfort, marked swelling, repeated vomiting, or cannot pass stool or gas after the test.

Call emergency services for severe breathing difficulty, collapse, or rapidly worsening severe symptoms.

Common questions

Can I drink coffee before the test?

Usually not. Coffee, including black coffee, may affect stomach activity and means the stomach is not fully empty. Follow the fasting instructions from your imaging center.

Does the time of day matter?

The images are not inherently more accurate at a particular time. Morning appointments may be easier because fasting is required and the examination can take several hours.

Can I exercise beforehand?

Ordinary activity is unlikely to alter the images significantly. Avoid exercise that leaves you dehydrated or requires food and drink during the fasting period.

Can I take my usual medicines?

Often you can take essential medicines with a small sip of water, but instructions differ. Ask in advance, particularly about diabetes medicines or medicines that must be taken with food.

Can I drive home afterward?

Usually yes because sedation is not normally used. If your center plans to give a sedating

medicine, you will need to follow its driving and escort instructions.

Why are my stools white afterward?

Barium is white and leaves the body in your stool. Pale stools for a short period are expected, but persistent constipation or increasing abdominal symptoms need medical advice.

Sources

- National Institute of Diabetes and Digestive and Kidney Diseases: Upper GI Series
- RadiologyInfo.org: Upper GI Tract Radiography
- RadiologyInfo.org: Small Bowel Follow-Through
- American College of Radiology: ACR Manual on Contrast Media
- U.S. Food and Drug Administration: Medical X-ray Imaging