

## **X-ray of Upper GI Tract (Barium Swallow)**

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### *What is Upper Gastrointestinal (GI) Tract X-ray?*

Also called an "upper gastrointestinal (GI) series" or simply an "upper GI," upper gastrointestinal tract radiography is an x-ray examination of the esophagus, stomach and first part of the small intestine (also known as the duodenum). However, in order for the anatomy to show up on radiographic images the upper gastrointestinal tract must be coated or filled with a contrast material called barium, an element that appears bright white on radiographs. The barium is given to the patient to drink. This procedure is called "upper gastrointestinal tract radiography" when the esophagus, stomach and duodenum are evaluated or a "barium swallow" when only the pharynx and esophagus are evaluated. Additionally, some patients are asked to swallow baking-soda crystals to create gas and further improve the images; this procedure has the modified name of "air-contrast" or "double-contrast upper GI."

### *What are some common uses of Upper GI Tract X-ray?*

An upper GI procedure is done to observe digestive function or to detect abnormalities



*Radiograph from double-contrast upper GI showing a normal esophagus.*

such as ulcers, tumors or inflammation of the esophagus, stomach and duodenum. Patients who undergo this procedure are usually those who have difficulty swallowing, are complaining of chest and abdominal pain or reflux (a backward flow of partially digested food and digestive juices), or have unexplained vomiting, severe indigestion or blood in the stool (indicating internal GI bleeding).

### *How should I prepare for my Upper GI Tract X-ray?*

Your doctor will give you detailed instructions on how to prepare for your upper GI imaging. The quality of the images obtained during this procedure can be degraded if the stomach is not empty of food. Therefore, you will likely be asked not to eat or drink anything (including orally administered medications, especially antacids) after midnight on the day before the examination. Nor should you chew gum or smoke after this time as these activities can increase stomach secretions that also may degrade the quality of the images.

Before the procedure begins, you will be asked to remove all jewelry and also may be asked to wear a special gown with no metal fasteners that could show up on the images.

### *How does the Upper GI Tract X-ray procedure work?*

Initially, the radiologist monitors the flow of barium into the upper gastrointestinal tract. He or she does this by viewing your upper gastrointestinal tract on a fluoroscope, a device that projects radiographic images in a movie-like sequence onto the screen monitor. Still images are then obtained. The x-rays are absorbed in varying amounts by the barium-coated upper gastrointestinal tract, producing a negative image—similar to that from a photographic camera—which is stored on film or on a computer.

### *How is the Upper GI Tract X-ray performed?*

Upper GI imaging is simple enough to be done in a radiology office or a medical center's radiology department as an outpatient procedure. It is usually scheduled in the morning to reduce your time of fasting.

A radiologic technologist or nurse will position you next to the radiographic machinery. You may be asked to swallow baking-soda crystals (sometimes called "fizzies") to create gas in your stomach. Then you will be asked to drink a cup of liquid barium, which resembles a light-colored milkshake.

The radiologist will note the passage of barium into your esophagus and stomach on the fluoroscopic monitor. Once the upper gastrointestinal tract is adequately coated with the barium, still radiographs are obtained.

The examination is usually completed within 20 minutes.

*What will I experience during my Upper GI Tract X-ray?*

The liquid barium has a chalky taste although the taste can be masked somewhat by added flavors such as strawberry or chocolate. If you receive gas producing crystals you may feel the need to belch. However, the radiologist or technologist will tell you to hold the gas in (by swallowing your saliva if necessary) as its presence in the stomach enhances the detail in the radiographic images.

First you will be standing up, then lying down as the radiologist obtains pictures of your esophagus, stomach and duodenum. You will be asked to hold your breath to prevent blurring of the still images. Also, periodically you will be asked to move into different positions while standing and to roll into different positions while lying on the examining table. In some medical centers, the technologist can minimize patient movement by automatically tilting the examining table. These actions assure that the barium is coating all parts of the upper GI tract. As the procedure continues, the technologist or the radiologist may ask you to drink more barium.

During this procedure you may hear the mechanical noises of the radiographic apparatus moving into place. Once the examination is complete, you will be asked to wait. At this time the radiologist will preliminarily examine the images to be sure they contain the necessary information for a careful evaluation later. If the radiographs are acceptable, you can dress and leave the examining area. Occasionally repeat imaging may be necessary.

After the examination you can resume a regular diet and take orally administered medications unless told otherwise by your doctor. The barium may color stools gray or white for 48 to 72 hours after the procedure. Sometimes the barium can cause temporary constipation, which is usually treated by an over-the-counter laxative.

### *What are the benefits vs. risks of Upper GI Tract X-ray?*

#### Benefits

- Upper gastrointestinal tract radiography is safe and the results usually lead to an accurate analysis of the esophagus, stomach and duodenum.
- Exposure to radiation is kept to a minimum.
- This is an extremely safe, noninvasive procedure.

#### Risks

- Some patients may be allergic to the flavoring added to some brands of barium. If you have experienced allergic reactions after eating chocolate, certain berries or citrus fruit, be sure to tell your doctor or the technologist before the procedure.
- There is a slight chance that some barium could be retained, leading to a blockage of the digestive system. Therefore, patients who have an obstruction in the gastrointestinal tract should not undergo this examination.
- The effective radiation dose from this procedure is about 2 mSv, which is about the same as the average person receives from background radiation in eight months. See the Safety page for more information about radiation dose.
- Women should always inform their doctor or x-ray technologist if there is any possibility that they are pregnant. See the Safety page for more information about pregnancy and x-rays.

### *What are the limitations of Upper GI Tract X-ray?*

The effectiveness of this procedure is limited only by the quality of the subsequent images.

Examinations can be delayed due to scheduling conflicts or temporary problems with equipment. However, as with many radiologic procedures, medical centers have begun digitizing radiographs rather than developing them on film. Digitizing the images shortens the time of the procedure, resulting in fewer delays and more flexible examination schedules. In addition, many medical centers can store images on electronic media, such as computer disks, rather than as film in large hospital libraries.