



## Video Fluoroscopic Swallowing Exam (VFSE)

A video fluoroscopic swallowing exam (VFSE) uses a form of real-time x-ray called fluoroscopy to evaluate a patient's ability to swallow safely and effectively. The exam is typically well tolerated, noninvasive, and can help identify the consistencies of liquid and food that a patient can most safely consume.

Tell your doctor if there's a possibility you are pregnant and discuss any recent illnesses, medical conditions, medications you're taking and allergies, especially to contrast materials. This procedure requires little to no special preparation, although you may be instructed to

not smoke, chew gum, eat or drink several hours prior to your exam. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown.



## What is a Video Fluoroscopic Swallowing Exam (VFSE)?

A video fluoroscopic swallowing exam (VFSE), also referred to as a modified barium swallow exam (MBS), or sometimes a "speech swallow exam", is a radiologic examination of swallowing function that uses a special movie-type x-ray called fluoroscopy. The patient is observed swallowing various consistencies and textures, ranging from thin barium to barium-coated cookies, in order to evaluate his or her ability to swallow safely and effectively. This exam is often performed with a speech-language pathologist present.

An x-ray (radiograph) is a noninvasive medical test that helps physicians diagnose and treat medical conditions. Imaging with x-rays involves exposing a part of the body to a small dose of ionizing radiation to produce pictures of the inside of the body. X-rays are the oldest and most frequently used form of medical imaging.

Fluoroscopy allows imaging of anatomical structures in real-time and allows the interpreting physician to observe structure and limited function.

A VFSE may be performed as an independent test to look at the swallowing mechanism, or together with

an esophagram (sometimes called a barium swallow exam), which evaluates the structure and function of the esophagus to the level of the stomach. The names of these two exams are similar, which can sometimes cause confusion when test orders are being entered. Therefore, be sure to clarify with your physician which exam your doctor intended to prescribe.

## What are some common uses of the procedure?

The VFSE is performed on patients of all ages with dysphagia, the technical term for difficulty swallowing. It is used primarily for evaluating the swallowing function and any evidence of aspiration, which is liquid or food going into the airway (the trachea and bronchi) instead of staying in the pharynx and esophagus.

In order to help a patient swallow more safely and efficiently, speech-language pathologists may suggest maneuvers, such as tucking or tilting the chin or turning the head while swallowing. The VFSE can also be used to evaluate and observe the effectiveness of these swallowing strategies. The speech-language pathologist may also suggest thickening liquids to help prevent aspiration.

The VFSE may be performed because of a known or suspected swallowing problem or because of the presence of conditions that are strongly associated with swallowing difficulty, such as:

- coughing and/or choking while eating or drinking
- coughing, choking or drooling with swallowing
- wet-sounding voice
- changes in breathing when eating or drinking
- frequent respiratory infections
- known or suspected aspiration pneumonia
- masses on the tongue, pharynx or larynx
- muscle weakness, or myopathy, involving the pharynx
- neurologic disorders likely to affect swallowing.

## How should I prepare?

You should inform your physician of any medications being taken and if there are any allergies, especially to iodinated contrast materials. Also inform your doctor about recent illnesses or other medical conditions.

Other than medications, you may be instructed to not eat or drink anything for several hours before your procedure.

You may also be asked to refrain from smoking or chewing gum prior to the exam.

You will be asked to remove some of your clothes and to wear a gown during the exam. You may also be asked to remove jewelry, removable dental appliances, eye-glasses and any metal objects or clothing that might interfere with the x-ray images.

Women should always inform their physician and x-ray technologist if there is any possibility that they are pregnant. Many imaging tests are not performed during pregnancy so as not to expose the fetus to radiation. If an x-ray is necessary, precautions will be taken to minimize radiation exposure to the baby. See the Safety page for more information about pregnancy and x-rays.

Video fluoroscopic swallowing studies are also commonly performed on infants and children. Your doctor will give you detailed instructions to prepare your child for the examination. You may be asked to bring small amounts of the foods and liquids your child is able to eat and drink as well as things he or she has difficulty swallowing. You may also be asked to bring the things your child normally uses when eating or drinking, such as the bottles and nipples you use at home, sipper ("sippy") cups, and/or eating utensils such as spoons.

The foods you bring to the exam will be mixed with a material called barium that will show up on the x-ray. You may want to explain to your child that the barium may change the way the food looks and tastes.

## What does the equipment look like?

The equipment typically used for this examination consists of a radiographic table, one or two x-ray tubes and a television-like monitor that is located in the examining room. Fluoroscopy, which converts x-rays into video images, is used to watch and guide progress of the procedure. The video is produced by the x-ray machine and a detector that is suspended over a table on which the patient lies.

For a VFSE, the patient is usually sitting or standing upright and the image intensifier (the "x-ray eye") is either located in front or looking in from the side of the patient.

## How does the procedure work?

X-rays are a form of radiation like light or radio waves. X-rays pass through most objects, including the body. Once it is carefully aimed at the part of the body being examined, an x-ray machine produces a small burst of radiation that passes through the body, recording an image on photographic film or a special detector.

Fluoroscopy uses a continuous or pulsed x-ray beam to create a sequence of images that are projected onto a fluorescent screen, or television-like monitor. When used with a contrast material, which clearly defines the area being examined by making it appear dark (or by electronically reversing the image contrast to white), this special x-ray technique makes it possible for the physician to view joints or internal organs in motion. Still images or movies are also captured and stored electronically on a computer.

Until recently, x-ray images were maintained on large film sheets (much like a large photographic negative). Today, most images are digital files that are stored electronically. These stored images are easily accessible for diagnosis and disease management.

The VFSE may also be recorded so that the images can be reviewed after the exam ends.

## How is the procedure performed?

Your physician and/or speech-language pathologist will take your medical history, including complaints of difficulty swallowing.

A radiologist or radiologic technologist and a speech-language pathologist will guide you through the swallow exam.

You will be positioned upright on a chair or stool or be standing on a platform. If necessary, you may remain in a wheelchair. Infants and children are positioned in secure seats.

You will be directed to eat and drink controlled amounts of foods and liquids in a variety of consistencies to which barium, a contrast material, has been added. The speech pathologist may try to help you swallow better by using different cups or utensils or changing your body position.

As you eat and drink, the x-ray camera will be moved near your throat. The speech-language pathologist and radiologist will watch you swallow in real-time through a fluoroscope, a device that projects x-ray images in a movie-like sequence onto a monitor. The images are usually captured digitally, so they can be reviewed later.

The imaging portion of this procedure is usually completed within 15 minutes.

## What will I experience during and after the procedure?

You may find the taste and consistency of the barium unpleasant.

After the examination, you can resume your usual diet and take orally administered medications unless told otherwise by your doctor. You may also resume your normal activities.

For a day or two following your exam, your bowel movements may look white because of the barium. White bowel movements are normal. Sometimes the barium can cause temporary constipation, which is usually treated by an over-the-counter laxative.

Drinking increased quantities of fluids for several days following the test can also help. If you are unable to have a bowel movement, or if your bowel habits undergo any significant changes following the exam, you should contact your physician.

## Who interprets the results and how do I get them?

The results are reviewed by speech-language pathologists and radiologists. When the examination is complete, the speech-language pathologist may meet with you to discuss the results of the exam and will also send a report to your primary care or referring physician.

A radiologist, a physician specifically trained to supervise and interpret radiology examinations, will analyze the images and send a signed report to your primary care or referring physician, who will discuss the results with you.

Follow-up examinations may be necessary. Your doctor will explain the exact reason why another exam is requested. Sometimes a follow-up exam is done because a potential abnormality needs further evaluation with additional views or a special imaging technique. A follow-up examination may also be necessary so that any change in a known abnormality can be monitored over time. Follow-up examinations are sometimes the best way to see if treatment is working or if a finding is stable or changed over time.

## What are the benefits vs. risks?

### Benefits

- The VFSE is a noninvasive procedure.
- Allergic reactions to barium are extremely rare.
- The VFSE can help determine the consistencies of food that a patient can most safely eat, which can limit the risk of aspiration (liquids and/or food entering the airway and lungs).
- No radiation remains in a patient's body after an x-ray examination.
- X-rays usually have no side effects in the typical diagnostic range for this exam.

### Risks

- There is always a slight chance of cancer from excessive exposure to radiation. However, the benefit of an accurate diagnosis far outweighs the risk.
- The effective radiation dose from this procedure varies. See the Safety page for more information about radiation dose.
- Occasionally, 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 physician or the technologist before the procedure.
- If barium accidentally gets into your lungs because you aspirate during the exam, it does not cause any lasting harm. Barium may be visible on future images, however.
- There is a slight chance that barium could be retained in the gastrointestinal (GI) system, leading to a blockage. Therefore, patients who have a known obstruction in the GI tract should not undergo this examination.
- Women should always inform their physician 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.

## A Word About Minimizing Radiation Exposure

Special care is taken during x-ray examinations to use the lowest radiation dose possible while producing the best images for evaluation. National and international radiology protection organizations continually review and update the technique standards used by radiology professionals.

Modern x-ray systems have very controlled x-ray beams and dose control methods to minimize stray

(scatter) radiation. This ensures that those parts of a patient's body not being imaged receive minimal radiation exposure.

## What are the limitations of a Video Fluoroscopic Swallowing Exam?

The VFSE only evaluates the area from the back of the mouth through the pharynx (throat) to the top of the chest. In some cases, the patient's symptoms may be due to abnormalities in the esophagus, which is lower in the chest. An esophagram, also sometimes called a barium swallow exam, may be performed if the problem is thought to be lower in the esophagus.

### Disclaimer

This information is copied from the RadiologyInfo Web site (<http://www.radiologyinfo.org>) which is dedicated to providing the highest quality information. To ensure that, each section is reviewed by a physician with expertise in the area presented. All information contained in the Web site is further reviewed by an ACR (American College of Radiology) - RSNA (Radiological Society of North America) committee, comprising physicians with expertise in several radiologic areas.

However, it is not possible to assure that this Web site contains complete, up-to-date information on any particular subject. Therefore, ACR and RSNA make no representations or warranties about the suitability of this information for use for any particular purpose. All information is provided "as is" without express or implied warranty.

Please visit the RadiologyInfo Web site at <http://www.radiologyinfo.org> to view or download the latest information.

**Note:** Images may be shown for illustrative purposes. Do not attempt to draw conclusions or make diagnoses by comparing these images to other medical images, particularly your own. Only qualified physicians should interpret images; the radiologist is the physician expert trained in medical imaging.

### Copyright

This material is copyrighted by either the Radiological Society of North America (RSNA), 820 Jorie Boulevard, Oak Brook, IL 60523-2251 or the American College of Radiology (ACR), 1891 Preston White Drive, Reston, VA 20191-4397. Commercial reproduction or multiple distribution by any traditional or electronically based reproduction/publication method is prohibited.

Copyright © 2018 Radiological Society of North America, Inc.