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For patients

Breast Ultrasound



Ultrasound imaging of the breast uses sound waves to produce pictures of the internal structures of the breast. It is used to help diagnose breast lumps or other abnormalities found during a physical exam or seen on a mammogram or breast MRI. Ultrasound is safe, noninvasive, and does not use radiation.

This exam requires little to no special preparation. Leave jewelry at home and wear loose, comfortable clothing. You will need to undress from the waist up and to wear a gown during the exam.

What is Ultrasound Imaging of the Breast?

Ultrasound imaging is a noninvasive medical test that helps physicians diagnose and treat medical conditions. It is safe and painless. It produces pictures of the inside of the body using sound waves. Ultrasound imaging is also called sonography (http://www.radiologyinfo.org) . It uses a small probe called a transducer and gel placed directly on the skin. High-frequency sound waves travel from the probe through the gel into the body. The probe collects the sounds that bounce back. A computer uses those sound waves to create an image. Ultrasound exams do not use radiation (http://www.radiologyinfo.org) (x-rays (http://www.radiologyinfo.org)). Because ultrasound captures images in real-time, it can show the structure and movement of the body's internal organs. The images can also show blood flowing through blood vessels.

Doppler ultrasound (http://www.radiologyinfo.org) is a special ultrasound technique that evaluates movement of materials in the body. It allows the doctor to see and evaluate blood flow through arteries and veins in the body.

Ultrasound (US) of the breast produces a picture of the internal structures of the breast.

During a breast ultrasound exam, the ultrasound technologist or doctor may use Doppler techniques to evaluate blood flow or lack of flow in any breast mass. In some cases, this may provide additional information as to the cause of the mass.

What are some common uses of the procedure?

- **Determining the Nature of a Breast Abnormality**
  Doctors use breast ultrasound to help diagnose breast abnormalities detected during a physical exam. These may include a lump or spontaneous bloody/clear nipple discharge. They also use ultrasound to characterize potential abnormalities seen on mammography (http://www.radiologyinfo.org) or breast magnetic resonance imaging (MRI).
- Breast ultrasound can help determine if an abnormality is solid (which may be a non-cancerous lump of tissue or a cancerous tumor), fluid-filled (such as a benign (http://www.radiologyinfo.org) cyst (http://www.radiologyinfo.org)), or both cystic and solid.
- **Breast Cancer Screening**
  Mammography (https://www.radiologyinfo.org/en/info/mammo) is the only screening tool for breast cancer that is known to reduce deaths due to breast cancer through early detection. Even so, mammograms do not detect all breast cancers. Some breast lesions and abnormalities are not visible or are difficult to interpret on mammograms. In breasts that are dense – meaning there are a lot of ducts, glands, and fibrous tissue and less fat – many cancers can be hard to see on mammography.
- Several supplemental screening options can help detect cancers that may not be visible on mammography alone. These

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include handheld breast ultrasound, automated breast ultrasound (ABUS) — an FDA-cleared volumetric ultrasound exam designed specifically for screening women with dense breasts and a normal mammogram — and breast MRI.

- Screening breast ultrasound may identify abnormalities that are not visible with mammography, including some that may require biopsy. Many of the abnormalities found with screening breast ultrasound are not cancer (false positives). MRI is more sensitive than ultrasound in depicting breast cancer, but MRI may not be available to all women. If you obtain a screening MRI, screening ultrasound is not needed. *See the Breast Cancer Screening page (https://www.radiologyinfo.org/en/info/screening-breast) for more information.*

Breast ultrasound can be offered as a screening tool for women who:

- are at high risk for breast cancer and unable to undergo an MRI exam.
- are pregnant or breastfeeding and a non-radiation imaging option is preferred for the clinical question.
- have increased breast density (http://www.radiologyinfo.org) — when the breasts have a lot of glandular and connective tissue and not much fatty tissue. Since September 10, 2024, the U.S. Food and Drug Administration has required all mammography facilities to inform patients of their breast density category in the lay summary of the mammography report. S*ee the Dense Breasts (https://www.radiologyinfo.org/en/info/dense-breasts) page for more information.*
- **Automated Breast Ultrasound (ABUS)**
  ABUS is a supplemental breast cancer screening option. ABUS is FDA-cleared as an adjunct to mammography for women with dense breasts and a normal mammogram. It is increasingly available, and patients are likely to encounter the term.
- **Ultrasound-guided Breast Biopsy**
  When a breast ultrasound reveals a suspicious abnormality, the radiologist may recommend an ultrasound-guided biopsy (http://www.radiologyinfo.org) . Because ultrasound provides real-time images, doctors often use it to guide biopsy procedures. A breast ultrasound exam will usually be necessary before the biopsy to plan the procedure and to determine if this method can be used.

  See the Ultrasound-guided Breast Biopsy (https://www.radiologyinfo.org/en/info/breastbius) page for more information.

Who interprets the results and how do I get them?

A radiologist, a doctor trained to supervise and interpret radiology exams, will analyze the images. The radiologist will send a signed report to the doctor who requested the exam. Your doctor will then share the results with you. In some cases, the radiologist may discuss results with you after the exam.

You may need a follow-up exam. If so, your doctor will explain why. Sometimes a follow-up exam further evaluates a potential issue with more views or a special imaging technique. It may also see if there has been any change in an issue over time. Follow-up exams are often the best way to see if treatment is working or if a problem needs attention.

What are the benefits vs. risks?

Benefits

- Most ultrasound scanning is noninvasive (no needles or injections).
- Occasionally, an ultrasound exam may be temporarily uncomfortable, but it should not be painful.
- Ultrasound is widely available, easy to use, and less expensive than most other imaging methods.
- Ultrasound imaging is extremely safe and does not use radiation.
- Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.
- Ultrasound provides real-time imaging. This makes it a good tool for guiding minimally invasive (http://www.radiologyinfo.org) procedures such as needle biopsies (http://www.radiologyinfo.org) and fluid aspiration.
- Ultrasound imaging can help detect lesions in women with dense breasts.

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- Ultrasound may help detect and classify a breast lesion that cannot be interpreted adequately through mammography alone.
- Using ultrasound, doctors are able to determine that many areas of clinical concern are due to normal tissue (such as fat lobules (https://www.radiologyinfo.org/en/info/breastus)) or benign cysts.
- When a woman has a focal symptom such as a palpable lump, focal pain, or spontaneous nipple discharge, ultrasound is typically the first imaging test used in women under 30. For women 30 and older with a focal symptom, both diagnostic mammography and ultrasound are usually performed together. This is different from routine screening, where mammography is the standard exam for women at average risk.

Risks

- Standard diagnostic ultrasound (http://www.radiologyinfo.org) has no known harmful effects on humans.
- Interpretation of a breast ultrasound exam may lead to additional procedures such as follow-up ultrasound and/or aspiration or biopsy. Many of the areas thought to be of concern turn out to be non-cancerous (false positives).
- Supplemental screening ultrasound has a higher false-positive rate than mammography. Most biopsies prompted by screening ultrasound do not turn out to be cancer.

What are the limitations of Ultrasound Imaging of the Breast?

- Ultrasound is one of the tools used in breast imaging, but it does not replace annual mammography.
- Many cancers are not visible on ultrasound. In particular, ductal carcinoma in situ (DCIS) — an early form of breast cancer — frequently presents only as calcifications on mammography and is typically not seen on ultrasound. This is one reason ultrasound does not replace mammography, even in women with dense breasts. MRI findings that are due to cancer are not always seen on ultrasound either.
- Biopsy may be recommended to determine if a suspicious abnormality is cancer or not.
- Most suspicious findings on ultrasound that require biopsy are not cancers.
- Many facilities do not offer ultrasound screening, even in women with dense breasts, and the procedure may not be covered by some insurance plans.
- It is important to choose a facility with expertise in breast ultrasound, preferably one where the radiologists specialize in breast imaging. Ultrasound depends on the abnormality being recognized at the time of the scan as it is a "real-time" examination. This requires experience and good equipment. One measure of a facility's expertise in breast ultrasound can be found in its ACR accreditation status. Check the facilities in your area by searching the ACR-accredited facilities database (https://www.acraccreditation.org/accredited-facility-search) .

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