

Sonohysterography (Ultrasound of the Uterus)

This information is reviewed by a physician with expertise in the area presented and is further reviewed by committees from the American College of Radiology (ACR) and the Radiological Society of North America (RSNA), comprising physicians with expertise in several radiologic areas.

What is Sonohysterography (Ultrasound of the Uterus)?

Ultrasound imaging, also called ultrasound scanning or sonography, involves exposing part of the body to high-frequency sound waves to produce pictures of the inside of the body. Ultrasound exams do not use ionizing radiation (as used in x-rays). Because ultrasound images are captured in real-time, they can show the structure and movement of the body's internal organs, as well as blood flowing through blood vessels.

Ultrasound imaging is a noninvasive medical test that helps physicians diagnose and treat medical conditions.

Sonohysterography, also known as saline infusion sonography, is a special, minimally invasive ultrasound technique. It provides pictures of the inside of a woman's uterus.

A Doppler ultrasound study may be part of a sonohysterography examination.

Doppler ultrasound is a special ultrasound technique that evaluates blood as it flows through a blood vessel.

What are some common uses of the procedure?

It is a valuable technique for evaluating unexplained vaginal bleeding that may be the result of uterine abnormalities such as:

- polyps
- fibroids
- atrophy
- adhesions (or scarring)
- masses
- congenital defects

Sonohysterography is also used to investigate uterine abnormalities in women who experience infertility or multiple miscarriages.

Doppler ultrasound images can help the physician to see and evaluate:

- blockages to blood flow (such as clots).
- tumors and congenital malformation.

How should I prepare?

You should wear comfortable, loose-fitting clothing for your ultrasound exam. You may need to remove all clothing and jewelry in the area to be examined.

You may be asked to wear a gown during the procedure.

It is best to perform sonohysterography one week after menstruation to avoid the risk of infection. At this time in the menstrual cycle, the endometrium is at its thinnest, which is the best time to determine if the endometrium is normal. The timing of the exam may vary, however, depending on the symptoms and their suspected origins. Sonohysterography should not be performed if you are pregnant.

No special preparation is required prior to the exam. You may be advised to take an over-the-counter medication shortly before the procedure to minimize any potential discomfort.

What does the equipment look like?



Ultrasound scanners consist of a console containing a computer and electronics, a video display screen and a transducer that is used to scan the body and blood vessels. The transducer is a small hand-held device that resembles a microphone, attached to the scanner by a cord. The transducer sends out high frequency sound waves into the body and then listens for the returning echoes from the tissues in the body. The principles are similar to sonar used by boats and submarines.

The ultrasound image is immediately visible on a nearby screen that looks much like a computer or television monitor. The image is created based on the amplitude (strength), frequency and time it takes for the sound signal to return from the patient to the transducer.

For ultrasound procedures requiring insertion of the transducer, such as transvaginal or transrectal exams, the device is covered and lubricated.

The saline is infused into the uterus by using a small, lightweight catheter.

How does the procedure work?

Ultrasound imaging is based on the same principles involved in the sonar used by bats, ships and fishermen. When a sound wave strikes an object, it bounces back, or echoes. By measuring these echo waves it is possible to determine how far away the object is and its size, shape, and consistency (whether the object is solid, filled with fluid, or both).

In medicine, ultrasound is used to detect changes in appearance of organs, tissues, and vessels or detect abnormal masses, such as tumors.

In an ultrasound examination, a transducer both sends the sound waves and records the echoing waves. When the transducer is pressed against the skin, it directs small pulses of inaudible, high-frequency sound waves into the body. As the sound waves bounce off of internal organs, fluids and tissues, the sensitive microphone in the transducer records tiny changes in the sound's pitch and direction. These signature waves are instantly measured and displayed by a computer, which in turn creates a real-time picture on the monitor. One or more frames of the moving pictures are typically captured as still images.

The same principles apply to ultrasound procedures such as transrectal and transvaginal which require insertion of a special transducer into the body.

For sonohysterography, sterile saline is injected into the cavity of the uterus, distending or enlarging it. The saline outlines the endometrium (the lining of the uterine cavity) and allows for easy visualization and measurement. It also identifies any polyps or masses within the cavity. Saline and air may also be injected into the uterus so that the physician can look for air bubbles passing through the fallopian tubes, which would indicate patency of the fallopian tubes.

Doppler ultrasound, a special application of ultrasound, measures the direction and speed of blood cells as they move through vessels. The movement of blood cells causes a change in pitch of the reflected sound waves (called the Doppler effect). A computer collects and processes the sounds and creates graphs or color pictures that represent the flow of blood through the blood vessels.

How is the procedure performed?

A baseline transvaginal ultrasound procedure is usually performed first to view the endometrium, or the lining of the uterus, including its thickness and any associated ovarian abnormality.

Transvaginal ultrasound is performed very much like a gynecologic exam and involves the insertion of the transducer into the vagina after the patient empties her bladder. The tip of the transducer is smaller than the standard speculum used when performing a Pap test. A protective cover is placed over the transducer, lubricated with a small amount of gel, and then inserted into the vagina. Only two to three inches of the transducer end are inserted into the vagina. The images are obtained from different orientations to get the best views of the uterus and ovaries. Transvaginal ultrasound is usually performed with the patient lying on her back with her feet in stirrups similar to a gynecologic exam.

Doppler sonography can also be performed through the transvaginal transducer.

Sonohysterography is then performed as a more in-depth investigation of the abnormalities and their potential causes. Determining the locations of certain abnormalities, such as fibroids or polyps, can be important when establishing a treatment or management strategy for a patient's particular condition.

Following the baseline exam, the transvaginal probe will be removed, and a sterile speculum will be inserted as the patient lies on her back with her knees bent or her feet in stirrups. The cervix will be cleansed, and a catheter will be inserted into the uterine cavity. Once the catheter is in place, the speculum will be removed, and the transvaginal probe will be re-inserted into the vaginal canal. Sterile saline will then be injected through the catheter into the uterine cavity as ultrasound is being performed.

This ultrasound examination is usually completed within 30 minutes.

What will I experience during and after the procedure?

Most ultrasound examinations are painless, fast and easy.

With transvaginal ultrasound, although the examination is often performed to look for a cause of pelvic pain, the sonogram itself should not be painful or significantly increase your discomfort. A vaginal sonogram is usually more comfortable than a manual gynecologic examination.

During the sonohysterogram, you may feel occasional cramping as a result of the introduction of the saline. Over-the-counter medication should be sufficient to minimize any discomfort associated with the procedure. You may have vaginal spotting for a few days after the procedure, which is normal.

If a Doppler ultrasound study is performed, you may actually hear pulse-like sounds that change in pitch as the blood flow is monitored and measured.

After an ultrasound exam, you should be able to resume your normal activities within a few hours.

Who interprets the results and how do I get them?

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 physician or the physician who referred you for the exam, who will share the results with you. In some cases the radiologist may discuss results with you at the conclusion of your examination.

What are the benefits vs. risks?

Benefits

- Most ultrasound scanning is noninvasive (no needles or injections) and is usually painless.
- Ultrasound is widely available, easy-to-use and less expensive than other imaging methods.
- Ultrasound imaging uses no ionizing radiation.
- Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.
- Ultrasound causes no health problems and may be repeated as often as is necessary if medically indicated.
- Sonohysterography is a simple, minimally invasive procedure that is well tolerated by patients and has very few complications.
- Sonohysterography is a relatively short procedure that provides an excellent view of the uterus and endometrial lining.
- Many uterine abnormalities that may not be seen adequately with routine transvaginal ultrasound may be viewed in detail with sonohysterography.
- Sonohysterography can prevent unnecessary surgery, and it can ensure that all polyps and fibroids are removed at surgery.

Risks

- For standard diagnostic ultrasound there are no known harmful effects on humans.

What are the limitations of Sonohysterography?

Sonohysterography should typically not be performed in women with active pelvic inflammatory disease.

Sonohysterography may have a few limitations in certain clinical situations. In women with stenosis of the cervix, it may be somewhat difficult to insert the catheter into the cervical canal so that saline may be injected. Inadequate distension (expansion) of the uterine cavity from the saline injection may also prevent good-quality ultrasound images from being obtained. This can occur especially with uterine adhesions (scarring) or large benign tumors called fibroids, which may partially obliterate the uterine cavity.

Also, sonohysterography is limited in the assessment of the patency, or openness, of the fallopian tubes because of their size and structure. In such cases where an abnormality of the fallopian tubes is suspected, a procedure such as hysterosalpingography might be recommended for further evaluation.

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