

## Hip Ultrasound

Hip ultrasound uses sound waves to produce pictures of muscles, tendons, ligaments, joints, bone and soft tissues of the hip. It is used to help diagnose abnormalities and may be used in infants to check for developmental dysplasia of the hip. Ultrasound is safe, noninvasive, and does not use ionizing radiation.

This procedure requires little to no special preparation. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown. If your child is being examined, your doctor will instruct you on how best to prepare.

### What is Ultrasound Imaging of the Hip?

Ultrasound images of the hip provide pictures of muscles, tendons, ligaments, joints, bone and soft tissues of the hip. In infants, the hip (which has a ball and cup configuration) is composed mainly of cartilage and is easily recognized on ultrasound.

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. 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 (x-rays). 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.

### What are some common uses of the procedure?

Hip ultrasound images are typically used to help evaluate:

- abnormalities of the muscles, such as tears and soft-tissue masses.
- foreign bodies, bleeding, infections or other types of fluid collections.
- benign and malignant soft tissue tumors.
- early changes of arthritis.
  
- Infant ultrasound can be used to check the hips for developmental dysplasia of the hip (DDH), which in infants can range from a shallow cup (bony acetabular dysplasia), to complete dislocation with the ball of the femoral head completely outside the socket.

Ultrasound of the hip can be performed on infants with DDH up to approximately six months of age.

### How should I prepare?

Wear comfortable, loose-fitting clothing. You may need to remove all clothing and jewelry in the area to be examined.

Ultrasound exams are very sensitive to motion, and an active or crying child can prolong the examination process. To ensure a smooth experience, it often helps to explain the procedure to the child prior to the exam. Bring books, small toys, music, or games

to help distract the child and make the time pass quickly. The exam room may have a television. Feel free to ask for your child's favorite channel.

In the case of an infant, it may be helpful to feed the baby just prior to the exam. Please check with the ultrasound staff before feeding. It is also possible to give the baby a pacifier or to bottle feed the infant during the exam. If you are present in the room during the procedure, standing where the infant can see you and hear your voice may make him or her more relaxed.

## **What does the equipment look like?**

Ultrasound machines consist of a computer console, video monitor and an attached transducer. The transducer is a small hand-held device that resembles a microphone. Some exams may use different transducers (with different capabilities) during a single exam. The transducer sends out inaudible, high-frequency sound waves into the body and listens for the returning echoes. The same principles apply to sonar used by boats and submarines.

The technologist applies a small amount of gel to the area under examination and places the transducer there. The gel allows sound waves to travel back and forth between the transducer and the area under examination. The ultrasound image is immediately visible on a video monitor. The computer creates the image based on the loudness (amplitude), pitch (frequency), and time it takes for the ultrasound signal to return to the transducer. It also considers what type of body structure and/or tissue the sound is traveling through.

## **How does the procedure work?**

Ultrasound imaging uses the same principles as the sonar that bats, ships, and fishermen use. 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 as well as its size, shape, and consistency. This includes whether the object is solid or filled with fluid.

Doctors use ultrasound to detect changes in the appearance of organs, tissues, and vessels and to detect abnormal masses, such as tumors.

In an ultrasound exam, a transducer both sends the sound waves and records the echoing (returning) waves. When the transducer is pressed against the skin, it sends small pulses of inaudible, high-frequency sound waves into the body. As the sound waves bounce off internal organs, fluids and tissues, the sensitive receiver in the transducer records tiny changes in the sound's pitch and direction. A computer instantly measures these signature waves and displays them as real-time pictures on a monitor. The technologist typically captures one or more frames of the moving pictures as still images. They may also save short video loops of the images.

## **How is the procedure performed?**

For most ultrasound exams of the hip, you will sit on an examination table and be asked to lie on your back or side.

Almost all of the ultrasound studies of infants and children are performed with the child lying on his or her back on the examination table.

The radiologist (a doctor specifically trained to supervise and interpret radiology exams) or sonographer will position you on the exam table. They will apply a water-based gel to the area of the body under examination. The gel will help the transducer make secure contact with the body. It also eliminates air pockets between the transducer and the skin that can block the sound waves from passing into your body. The sonographer places the transducer on the body and moves it back and forth over the area of interest until it captures the desired images.

There is usually no discomfort from pressure as they press the transducer against the area being examined. However, if the area is tender, you may feel pressure or minor pain from the transducer.

Once the imaging is complete, the technologist will wipe off the clear ultrasound gel from your skin. Any portions that remain will dry quickly. The ultrasound gel does not usually stain or discolor clothing.

When the exam is complete, the technologist may ask you to dress and wait while they review the ultrasound images.

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

Most ultrasound exams are painless, fast, and easily tolerated.

This ultrasound examination is usually completed within 20 minutes, but may sometimes take longer. Occasionally, a few more pictures are obtained after the initial review.

During hip ultrasound, the radiologist or sonographer may ask you to move the hip being examined or may move it for you to evaluate functions of the hip joint, muscle, ligament or tendon.

For infants, both hips are usually examined. The hip is checked in different positions and planes at rest and sometimes with gentle stress, this is painless. A small towel may be used to help position the infant.

Once the imaging is complete, the technologist will wipe off the clear ultrasound gel from your skin. Any portions that remain will dry quickly. The ultrasound gel does not usually stain or discolor clothing.

After an ultrasound exam, you should be able to resume your normal activities immediately.

## **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.

## **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 procedures such as needle biopsies and fluid aspiration.
- In some cases, ultrasound may be able to evaluate the tendon structure more accurately than MRI.
- The hip joints of infants, unlike those of adults, are largely made of cartilage, which allows excellent views of the entire hip joint using ultrasound.

### **Risks**

- Standard diagnostic ultrasound has no known harmful effects on humans.

## **What are the limitations of Ultrasound Imaging of the Hip?**

Ultrasound has difficulty penetrating bone and, therefore, can only see the outer surface of bony structures and not what lies within (except in infants who have more cartilage in their skeletons than older children or adults). Doctors typically use other imaging modalities such as MRI to visualize the internal structure of bones or certain joints.

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