

Pediatric Ultrasound of the Adbomen

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What is Pediatric Abdominal Ultrasound Imaging?

Ultrasound imaging, also called ultrasound scanning or sonography, is a method of obtaining images from inside the human body through the use of high frequency sound waves. The sound waves' echoes are recorded and displayed as a real-time visual image. No ionizing radiation is involved in ultrasound imaging. Because ultrasound images are captured in real time, they can show movement of internal tissues and organs and enable physicians to see blood flow. This can help to diagnose a variety of conditions and to assess damage caused by illness.

What are some common uses of Pediatric Abdominal Ultrasound Imaging?

In children, an abdominal ultrasound image is a useful way of examining internal organs, including the appendix, liver, gallbladder, spleen, pancreas, intestines, kidneys and bladder. Ultrasound is particularly valuable for evaluating abdominal pain in young children.



Ultrasound: Neonatal scan of lung, liver and bowel.

After traumatic injury, appendicitis is the most common reason for emergency abdominal surgery. Appendicitis can occur at any age, but is most common in young people ages 11 to 20. Ultrasound imaging is commonly used to help make the diagnosis of appendicitis in children. Ultrasound is fast, accurate and painless, does not require the child to remain still for long periods, and the equipment is less intimidating than the large tunnels of a magnetic resonance imaging (MRI) or computed tomography (CT) scan.

Ultrasound imaging can:

- Help a physician determine the source of abdominal pain, such as stones, abscesses or an inflamed appendix.
- Guide procedures such as needle biopsies, in which needles are used to sample cells from organs for laboratory testing.
- Help identify the cause for enlargement of an abdominal organ.
- Localize abnormal fluid in the abdomen.

How should my child be prepared for the Pediatric Abdominal Ultrasound procedure?

Your child should be dressed in comfortable, loose-fitting clothing for an ultrasound exam. Other preparation depends on the type of examination. For some scans, your doctor may ask you to withhold food and drink for as many as 12 hours before your child's appointment. For others, you may be asked to have your child drink up to six glasses of water two hours prior to the exam and avoid urinating, so that his or her bladder is full when the scan begins. Sedation is rarely needed for ultrasound examinations.

What does the Pediatric Abdominal Ultrasound equipment look like?

An ultrasound scanner consists of a console containing a computer and electronics, a video display screen and a transducer that is used to scan the body. The transducer is a small, hand-held device about the size of a bar of soap, attached to the scanner by a cord. The radiologist or sonographer spreads a lubricating gel on the child's abdomen in the area being examined, and then presses the transducer firmly against the skin to obtain images.

The ultrasound image is immediately visible on a nearby screen that looks much like a computer or television monitor. The radiologist or sonographer watches this screen during an examination; often, the patient is able to see it as well.

An example of the ultrasound equipment that may be used is shown at the top of this page.

How does the Pediatric Abdominal Ultrasound procedure work?

Ultrasound imaging is based on the same principles involved in the sonar used by bats, ships at sea and fish detectors. As a controlled sound bounces against objects, its echoing waves can be used to identify how far away the object is, how large it is, and how uniform it is.

The ultrasound transducer functions as both a loudspeaker to create the sounds and a microphone to record them. When the transducer is pressed against the skin, it directs a stream of inaudible, high-frequency sound waves into the body. As the sound waves echo from the body's fluids and tissues, the sensitive microphone in the transducer records the strength and location of the reflected waves. With Doppler ultrasound the microphone captures and records tiny changes in the sound wave'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. The live images of the examination can be recorded on videotape. In addition, still frames of the moving picture are usually frozen to capture a series of images.

How is the Pediatric Abdominal Ultrasound procedure performed?

Your child is positioned on an examination table, then a clear gel is applied to the abdomen to help the transducer make secure contact with the skin. The sound waves produced by the transducer cannot penetrate air, so the gel helps to eliminate air pockets between the transducer and the skin. The

sonographer or radiologist presses the transducer firmly against the skin and sweeps it back and forth to image the area of interest.

When the examination is complete, you and your child may be asked to wait while the ultrasound images are reviewed, either on film or on a TV monitor. Often, the sonographer or radiologist is able to review the ultrasound images in real time as they are acquired, and your child can be released immediately.

What will my child experience during the Pediatric Abdominal Ultrasound procedure?

Ultrasound imaging of the abdomen is painless, fast and easy. Your child will lie on his or her back on an examining table. The radiologist or sonographer will spread warm gel on the skin, then press and move the transducer firmly against the body to capture the desired images. There may be varying degrees of discomfort from pressure as the radiologist or sonographer guides the transducer over the abdomen, especially if the child has a full bladder. The examination usually takes less than 30 minutes.

What are the benefits vs. risks of Pediatric Abdominal Ultrasound ?

Benefits

- Ultrasound provides real-time imaging, making it a good tool for quick evaluation of potentially emergent conditions such as appendicitis.
- Ultrasound equipment is much less intimidating to young children than the large equipment used in other types of imaging, such as magnetic resonance imaging (MRI) or computed tomography (CT) scans.
- Ultrasound scanning does not require a child to lie perfectly still in order to capture a useful image.
- Ultrasound imaging is a painless, low-cost and non-invasive examination.
- Ultrasound is widely available and easy to use.
- Ultrasound does not expose children to ionizing radiation.

Risks

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

What are the limitations of Pediatric Abdominal Ultrasound Imaging?

Ultrasound has difficulty penetrating bone and therefore can only see the outer surface of bony structures and not what lies within. For visualization of bone, other imaging procedures, such as x-ray, computed tomography (CT) or magnetic resonance imaging (MRI), may be selected. Sound waves do not pass through air, and evaluation of the stomach, small intestine and large intestine may be limited by gas within these structures.