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Ultrasound in Veterinary Medicine

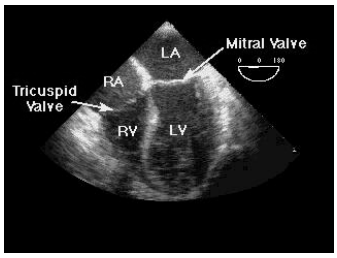
Ultrasound is a commonly used imaging tool in both veterinary medicine and human medicine. But what is it, and how does it benefit our animal patients?

The term "ultrasound" applies to all acoustic energy with a frequency above human hearing (20,000 hertz or 20 kilohertz). Typical diagnostic ultrasound machines operate in the frequency range of 2 to 18 megahertz, hundreds of times greater than this limit! This sound wave is typically produced by a special transducer encased in a probe. The probe is placed against the part of the body that one wants to image, and typically a gel or alcohol solution is applied to increase the transmission of the sound wave.

The same probe simultaneously measures for the return of energy (echo). Depending on the direction of the echo, how strong the echo was, and how long it to the echo to be received from when the sound was transmitted, an image is formed digitally on the computer.

Since different body tissues have different thicknesses, this is shown on the computer screen as different shades of grey. Tissues that are less dense or reflective are darker, while those that are more reflective (i.e. thicker) image lighter.

There are no potential side effects with an ultrasound study. Since most veterinary patients have a great deal more hair than their human counterparts, it is not unusual to have to shave some hair from the region being evaluated in order to obtain a good quality study. Unless a biopsy is being performed, most patients do not require any form of sedation or anesthesia.



An ultrasound of the chest is commonly called an echocardiogram. Ultrasound is an excellent tool for evaluating cardiac function. Utilizing ultrasound, the heart can be seen beating in real-time, and all of its chambers and valves can be both seen and measured. In addition, flow of blood to and from the heart can be visualized utilizing a technique known as "color flow Doppler." This is especially useful to see where murmurs or turbulent blood flow is coming from.

Since the chest is filled with air which is not reflective, ultrasound is not a good choice for imaging lungs, unless there is consolidation or masses. As bones are very solid, and thus very reflective, ultrasound is usually not used to evaluate them. X-rays or CT scans are better for imaging lung tissue or bones. In some instances, different kinds of imaging studies will be done concurrently in order to obtain complementary information.

The abdomen, with many organs of varying densities, lends itself to ultrasonagraphic examination. Ultrasound allows for assessment of the liver, kidneys, spleen, stomach, intestines, colon, bladder, pancreas, adrenal glands, ovaries, uterus and cervix, prostate gland, and abdominal lymph nodes. In addition to structure, exact measurements can be taken.

Ultrasound is also an excellent tool for facilitating tissue sampling. It can be used to help guide the exact placement of needles for obtaining cells or fluid

for laboratory analysis (ultrasound guided cytology or biopsy). Often this procedure is performed with a light sedative or quick acting anesthetic and is far less invasive than surgery. If a biopsy is done, often a coagulation panel is done immediately prior to the procedure in order to verify that the body has normal clotting abilities, as there is a slight risk of bleeding whenever a biopsy is performed.

At the Monroe Animal Hospital, we recognize the utility and importance of diagnostic ultrasound and know that the information obtained from the ultrasound is only as good as the person obtaining and interpreting the images. Therefore we have mobile ultrasound specialists come to our hospital upon request in order to perform this procedure. This allows us to obtain information about your pet from veterinarians who are specifically trained. In almost all cases, we receive results the same day.

Health Certification and Flying

With the travel season almost upon us, we want to remind our clients of the need to obtain a USDA Health Certificate prior to airline travel. Most states require this form for admittance, and many airlines require it as well. Please check with your airline to determine how many days before travel the health certificate examination needs to take place; often the airlines may have different requirements from the state or country you will be flying to.

Microchips

About the size of a grain of rice, these devices may be your pet's best protection should he or she ever become lost. Data from the American Humane Society provides some sobering statistics; only about 17 percent of lost dogs and two percent of lost cats ever find their way back to their original owners.

While collars can serve as a useful form of identification and we recommend them, unfortunately they can fall off and their tags can be scratched, fade, rust or become dented, rendering them unreadable. Tattoos can fade and their information is not able to be updated. Microchips, which are injected under the skin in the shoulder blade region of pets and consist of a transponder surrounded by sterile inert glass, are passive devices that in the presence of a microchip reader allow for a unique number to be read. This unique number is maintained in a nationwide database with the owners name, address, phone number, and email address. In this way, should a shelter, veterinarian, or humane society find a lost pet or have it brought to them, it can be scanned with a microchip reader, and if identified, may be reunited with its original owner.

It is important to remember that the microchips have no power supply, and thus can not be tracked like "LoJack" and no activation is required. Since they are passive devices, they do not have a limited lifespan.

There are currently a few different companies in the United States that produce microchips (Home Again, Bayer, AVID, AKC). Unfortunately, until recently, not all scanners were able to read information from all microchips. A further problem arose because microchips in Europe operated on a different frequency from American microchips and were not readable in the opposite continent. The good news is that now there are microchips that are acceptable both here and in Europe, and most shelters and vets now have universal scanners.

We urge all pet owners to consider microchipping their pets. Not only are they inexpensive, but many foreign countries such as members of the European Union, Japan, New Zealand, as well as Hawaii require microchips for pet's entering their borders. There have been case reports of pets being identified despite distances of thousands of miles from their original owners because of microchips. Should you and your pet become separated, they may be your pet's best shot at being reunited with you!

In Future Newsletters:
Genetic Screening in Pets
Changing Vaccination Protocols and Your Pet
Pet Hazards
Pain Control
Feline Dentistry