

Diagnostic Imaging

at Colorado Animal Specialty and Emergency (CASE)

CASE is happy to provide access to modern diagnostic imaging capabilities, including:

- » Radiography (x-ray)
- » Ultrasonography (sonography)
- » Computed Tomography (CT)
- » Magnetic Resonance Imaging (MRI)
- » Fluoroscopy (moving-video x-ray)

Radiologists at CASE

All diagnostic studies performed by the diagnostic imaging department at CASE, at any time, are interpreted by veterinary radiologists, either in-house or via telemedicine. IDEXX Veterinary Imaging is our remote, teleradiology service.

What is a Board-Certified Veterinary Radiologist?

Veterinary radiologists are specialists who have developed expertise in the field of imaging diagnosis, imaging physics, image-guided sampling, and some image-guided treatments.

Board-certified radiologists have completed a minimum of 1-2 years of internships and 3-4 years of residency training after completing veterinary school and have passed a national boards certification examination administered by the American College of Veterinary Radiology (ACVR). This is an equivalent level of education as practicing human doctors.



Throughout their training, veterinary radiologists have studied medical literature and interpreted thousands of diagnostic studies to develop a strong understanding of patterns of disease and improved abilities to diagnose your pet accurately. They understand the limitations and capabilities of different imaging tests, how to optimize these tests, and how to communicate results clearly to your pet's primary clinician and other specialist doctors.

Veterinary radiologists spend most of their time reading or performing imaging studies and giving opinions and recommendations about these results. As such, they are rarely seen by owners (wave if you spot us!) but are involved in nearly every patient's diagnostic plan that enters the hospital and get to meet many of the patients during their time in the hospital.

Ultrasound in Veterinary Medicine

Ultrasound can be performed by many different practitioners, including:

- » Technician/nurse sonographers, with interpretation thereafter by doctors
- » General practice clinicians
- » Emergency clinicians
- » Specialists in fields other than imaging (ex., emergency and critical care, internal medicine)
- » Radiologists

The ability of ultrasound to detect and diagnose conditions is greatly skill-dependent, and is an interplay of hand-eye coordination, medical and imaging physics knowledge, interpretation skill, quality of equipment, ability to effectively use this equipment, and instincts/pattern recognition developed over years of practice.

Who performs veterinary ultrasound can be determined by which practitioners are available at a particular clinic, urgency, case complexity, and the goals of an examination, not just ability level. For this reason, not all ultrasonography is considered equivalent. Occasionally, clinicians at CASE may request that a study be repeated on our premises for a second opinion or to obtain improved documentation and evidence of an abnormality.

The large majority of ultrasonography at CASE during daytime, weekday hours is directly performed (not just interpreted) by board-certified veterinary radiologists.

This provides multiple advantages for you and your pet, including:

- » An interpreter with extensive ultrasound-specific experience and training
- » The union of technical skill in performing the ultrasound with real-time interpretation and medical knowledge of a doctor (which can influence the methods used, and direct specific attention to certain regions likely to be abnormal)
- » Use of the highest-end clinical ultrasonography equipment, specifically tested and selected by our specialists
- » The ability of the radiologist to ask clarifying questions of the primary care team to improve understanding of findings
- » Tissue sampling immediately following the scan, eliminating the need for repeat sedation or repeat diagnostic procedures



Exceptions to this policy include:

- » Point-of-care ultrasonography (POCUS, AFAST, TFAST): used for rapid limited evaluation in the emergency setting and performed and interpreted by emergency and critical care doctors
- » Echocardiography (ultrasound of the heart): performed by board-certified cardiologists
- » After-hours and weekend ultrasonography, which is typically performed by a consulting sonographer service, with remote teleradiologist interpretation

Sedation for Diagnostic Imaging

While it is possible to perform radiography (x-ray) and ultrasonography (sonography) without sedation, it is often in the best interests of patients to receive some degree of sedative to relieve fear and anxiety, encourage muscle relaxation, and improve image quality.

It is not typical for patients to be so relaxed, friendly, and cooperative in the hospital setting that sedation is not at all beneficial, and this is often difficult to anticipate – a typically very friendly dog or cat may react unexpectedly or run out of patience when restrained. Some patients are so challenging (e.g. wiggly, panting heavily, aggressive) that diagnostic quality imaging cannot be achieved at all without sedation.

For abdominal ultrasound in particular, patients will need to tolerate having their belly shaved, being held on their backs for 15-25 minutes, pressing on their abdomen with the ultrasound probe, and sometimes having small needles passed through the body wall to collect tissue or fluid. This can be unpleasant, and pets do not understand that we are doing these things to help them.

Sedation, when using medications tailored to a specific patient's needs and known medical conditions, carries very low risk, which can be further reduced by our careful monitoring of vital signs, and the ability to reverse many sedative medications. If a patient is considered higher risk, our hospital's anesthesiologists are always willing and available to help achieve safe, adequate sedation.

Please understand that when we recommend sedation for imaging, it is in an effort to make the imaging process the least fearful and uncomfortable for your pets, while also returning the greatest diagnostic quality possible in return for your financial investment in their health.



Anesthesia for Diagnostic Imaging

Certain examinations, including the vast majority of computed tomography (CT) scans and all magnetic resonance imaging (MRI) scans, require patients to remain perfectly still for an extended period and to tolerate the injection of contrast agents into the bloodstream, which can be accompanied by unusual temperature sensations and feelings.

For this reason (and unlike in human medicine) veterinary species must be anesthetized for these procedures. Anesthesia is generally very safe and constantly improving in veterinary medicine, but it always carries risks. Your pet's clinician will be best equipped to discuss the individualized risks and benefits of anesthesia for your pet, if you have questions or concerns.

Diagnostic Imaging Reports

Finalized written reports will be included in your pet's medical record and constitute the complete, official documentation of a study. These are usually completed the same-day, though occasionally within a maximum of 24-36 hours, depending on case complexity and daily workload.

Verbal, preliminary consultation between primary clinicians and radiologists may take place prior to reporting to allow for real-time decisions regarding additional diagnostics or treatments - these conversations usually do not involve full systematic review of the study, and additional findings may be discovered at time of complete review and report drafting.

Please understand that the time we invest in these reports can be significant, ranging from as little as 5 minutes to more than 1.5 hours in a particularly complex case. We take pride in the completeness and accuracy of our reports, and maintaining these standards takes time! We appreciate your patience in waiting for imaging results.

Obtaining Copies of Diagnostic Images

Links to view or download your pet's saved diagnostic images from our imaging database can be provided on request. Occasionally, saved images may contain an incorrect annotation - if so, please refer to the written imaging report, which is considered the greater authority and will provide context or corrections as needed.