

Made you look!

Testaments to the digital infrared thermographic physiological screen

By Jeffery Smith DVM, CCRP, Janet Jones, VMD, and Ronald Riegel, DVM
For The Education Center

Performing an infrared thermographic screen as a routine procedure during your physical exam will expose anatomical areas that require punctilious examination. This visible imagery of the musculoskeletal, neurological, and circulatory system provides a holistic representation of the patient's current physiological state. Maladies that are often very subtle are discovered, evaluated, and integrated into the patient's history to aid in the determination of the best comprehensive care that we can provide the patient.

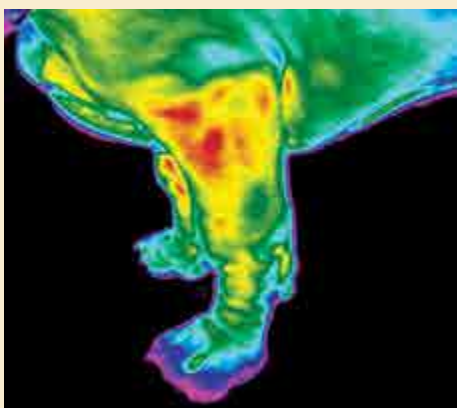
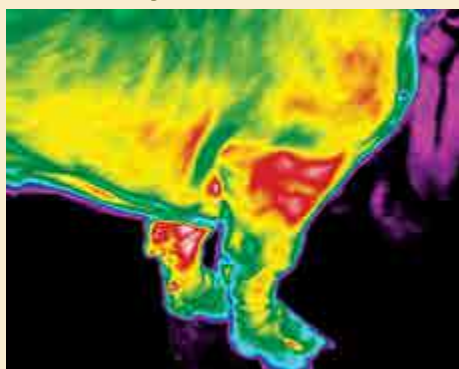
Digital thermal imaging (DTI) provides a physiologic image of the patient rather than an anatomic one. In other words, thermography shows changes in thermal gradients

that reflect inflammation or changes in circulation—nothing else in most clinics (unless nuclear scintigraphy is available) can do this.

DTI can help veterinarians be better diagnosticians and provide better care in four ways:

- Identify an area of suspected pathology; *i.e.*, partially torn cruciate ligament.
- Discover an area not suspected to be a problem; secondary and tertiary issues; *i.e.*, sore back in a geriatric dog.
- Monitor the progress of a healing injury or problem; *i.e.*, a dog recovering from intervertebral disc disease.
- Client education tool that allows a clearer understanding of the need for further diagnostics (X-rays, ultrasound, MRI, etc.) or further treatment (laser therapy, rehabilitation, pharmaceuticals, etc.).

Case study: BJ



Digital thermal images reveal asymmetrical thermal gradients throughout both shoulders and elbows.

Classically, DTI is recommended for any older, lame, or geriatric patient, but in the following case, BJ, a six-month-old male neutered basset hound puppy, proved to be an excellent candidate. On presentation (3/21/17) for a routine pre-surgery (neuter) examination, he was also reported to have previously jumped off a bed and been lame for two to three days but was now not noticeably lame. The owner felt that the problem had resolved, and as no dramatic CREPI (crepitus, range of motion, effusion, pain, or instability) could be demonstrated consistently, the client was content to take a wait and see approach. However, as we explained BJ was a basset and subject to some particular basset problems, the owner consented to a \$20 DTI physiological screen to actually “see” if any problems could be detected.

A standard survey series of 10 thermal images (up to 16 for larger dogs) were captured in a process that takes less than 5 minutes. The thermal window was 29.0 C to 39.9 C, and the images were displayed in the rainbow pallet. These images revealed an increased thermal gradient in the RF elbow area as well as a less marked increased thermal gradient in the RF shoulder. The actual temperature of any given point in these images is not nearly as significant as noticing the asymmetry between the two sides—something relatively easy for both clients and veterinarians to appreciate.

Based on abnormalities in the thermography exam, the owner consented to (and actually was interested in) having radiographs of the questionable areas.

Those radiographs revealed an ununited anconeal process with secondary degenerative joint disease in the RF elbow. The radiographs of the RF shoulder were normal, and the increased thermal gradient present was compensatory or secondary to the elbow pathology.



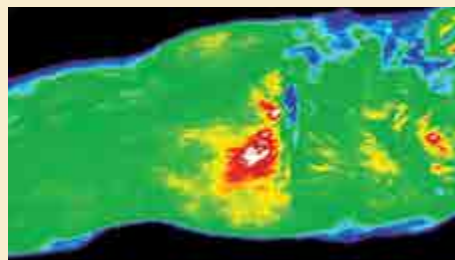
Ununited anconeal process with secondary degenerative joint disease in the RF elbow. The radiographs of the RF shoulder were normal.

Without digital thermal imaging, this condition would not have been found on this visit. (“It made you look further!”) Visualization of the physiological state of these anatomical areas made it easy to identify the area needing further evaluation and allowed the clients to appreciate the need for and consent to a radiographic study.

Case study: George

George was presented to Janet Jones, VMD, of Ark Animal Hospital, Wyomissing, Pa., for his annual wellness exam. He is a healthy 13-year-old male castrated Labrador retriever. When asked by Dr. Jones on how George had been doing, the owner replied, “George is doing fine. No problems at all.” Dr. Jones proceeded with a thorough physical exam and found nothing significant. Digital thermal imaging (12 images) was done of the entire patient prior to her exam and was blinded to Dr. Jones until after the physical exam was completed.

An asymmetrical area of increased thermal gradients was found on the right side adjacent to T4 - T6. There was an intense area of increase (white) centrally with dissipating radiating areas of increased in all directions.



When the owner saw the image, she said, “I brushed that exact same spot a few weeks ago and it seemed painful to George.”

She immediately consented to the suggested radiographic study.



Dr. Jones explained the diagnosis of discospindylosis and degenerative osteoarthritis of the spine to the client and prescribed pharmaceutical pain management and nutraceuticals.

Infrared digital thermal imaging allowed:

- Early detection of a disorder that wasn't palpated upon physical exam or mentioned in the history;
- Client education, which allowed immediate compliance for further diagnostics; and
- Baseline information for monitoring this patient's response to the treatment.

Conclusions

In both of these cases, digital infrared thermal imaging provided early detection of a disorder before it became clinically apparent, a visualization of the condition allowing the client understanding of why further diagnostics were needed, and provided baseline data to evaluate these cases in the future. We, as veterinarians, try to provide the best possible care for our patients each day. Digital infrared thermal imaging provided that care for both of these patients. ●

This Education Center article was underwritten by Digatherm Digital Thermal Imaging of Ocala, Fla.