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Thermography: A New Perspective on an Old Test

Its Value in the Clinical Chiropractic Practice

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The presence of thermography in chiropractic practice has diminished over the last several years with the fall in its reimbursement. This is an unfortunate circumstance, because the medical profession and dental profession have embraced thermography. This article will help the reader understand the practice and its value in the chiropractic profession today.

Thermography has been utilized in medical practice since the beginning of medicine itself. In fact, the father of medicine, Hippocrates first used thermography by covering a person in mud, then observing where on the anatomy the mud dried first, thus establishing the site of the pathology.¹ D.D. Palmer used skin surface temperature to aid in diagnosis. He referred to these "hot boxes" by using the dorsal aspect of his hand to locate areas of subluxation.²

Fortunately, thermography has become much more sophisticated. It cannot be overstated how valuable its application is in the chiropractic practice. Because it is unique in accurately assessing the physiological state of the patient's sympathetic nervous system, it is an extremely valuable tool in the diagnosis and management of many conditions.

Thermography is used as much in veterinary medicine as in allopathic medicine. It is used in small animal medicine and with equine and large animal practice. One study was used to help diagnose a traumatic coccygeal muscle injury in English Pointers (limber tail). Thermography was used to help diagnose the problem.³ Another study used heat to detect back pain in horses. The authors of this study stated that "infrared thermographic imaging is the most sensitive objective imaging currently available for the detection of back disease in horses."⁴ The author of this study says that this same procedure, or ITI, is a physiologic test that identifies vasomotor tone overlying other superficial tissue factors. Chronic back pain usually

involves vasoconstriction at the affected sites.

Diagnosis through heat also has broad applications in medicine and dentistry. Dentists use thermography to assess facial pain, TMJ conditions, implants, root canals, facial nerve injuries and other ailments. Suspected pathology of teeth or gums, which cannot be identified clinically or radiographically, but possibly through ITI, warrants investigation. Neuropathic facial pain is still too often misdiagnosed as tooth pain of dental origin, resulting in unnecessary dental extraction or endodontic therapy.⁵ Thermography is used to diagnose TMJ conditions. Computer measurements using facial thermography distinguish normal patient populations from symptomatic patients with acute TMJ pain.⁶ Vascular heat emissions can identify facial pain syndromes where other diagnostic tests may not be as beneficial.⁷

Thermography is being used to identify reflex sympathetic dysfunction, and is one of only three diagnostic tests to diagnose this condition. It is shown to be an effective way to monitor near-surface blood flow in the limbs of RSD patients and to be sensitive to changes accompanying painful conditions.^{8,9} An article in the *Journal of Pain* describes the use of infrared thermography (IRT) to analyze sympathetic vasoconstriction in CRPS patients.¹⁰

For patients experiencing back pain, thermography is being used to assess conditions of the facet joints, discs, myofascial conditions, nociceptive ones and nerve entrapments. A study by the UCSF Department of Radiology concludes that lumbar thermography is a "sensitive examination for detecting those patients who will demonstrate lumbar spinal CT abnormalities, and should play an important role in the diagnostic screening of low back pain syndrome patients."¹¹

Thermography is also an important adjunctive diagnostic tool in the assessment of radicular symptoms. In a study comparing IRT to CT, MRI and myelography, IRT was able to accurately assess radicular involvement in all of the involved cases.¹²

The measurement of blood flow through heat is also a test that is specific to its findings. A study in *Spine* (1994) notes that its utilization has relatively high specificity. Symptomatic severity of lumbar radiculopathy may be assessed by measuring the magnitude of thermal deficit in the affected limb.¹³

Thermography is also being used to assess tension headaches, migraine headaches, myofascial syndromes, deep vein thrombosis, bone and joint traumatic injuries and a host of other pain syndromes.¹⁴⁻¹⁹

Unfortunately, thermography has developed a tarnished reputation in the chiropractic profession. This is due in part to the many practitioners that took advantage of the procedure by overbilling insurance companies, and by the medical profession's portrayal of the value of thermography during the 1980s. Its practice has been directly proportional to the reimbursement for the test. This is unfortunate, because this very important examination has become almost nonexistent in chiropractic. The American College of Neurology has not reversed their decision of the use of thermography in a formal statement, but many practitioners of medicine condone its use for certain types of conditions.

This paper will help demonstrate the use of IRT in modern chiropractic practice and its role in the general medical profession. The validity of this examination has been well-established in literature. Over 30 years of research and **over 4,300 papers in all types of medical journals unequivocally support the efficacy of thermography use as a valid diagnostic test of global neurophysiology.** More than 98 percent of these papers are presented in peer review journals. These include but are not limited to: *Pain Journal; Spine Journal; Journal of the American Medical Association; British Medical Journal; Biomedical Matter Engineering; Anesthesia; Journal of Orofacial Pain; Journal of Muscle and Nerve; Journal of Manipulative and Physiological Therapeutics; Archives of Physical Medicine and Rehabilitation; Journal of the American Chiropractic Association; and the Journal of the American Dental Association*, to name a few.

There are numerous medical associations who support the use of thermography: the AMA Council on Scientific Affairs; American Academy of Medical Imaging; ACA Council on Diagnostic Imaging; ICA Council on Diagnostic Imaging; American Academy of Pain Management; American Academy of Head, Neck and Facial Pain; and TMJ Orthopedics have all issued statements confirming its efficacy as a valid diagnostic tool.

The medicolegal system allows thermography to be introduced as evidence in court cases, and it is accepted by federal agencies as being valid and useful. **In fact, the Supreme Court of New Jersey ruled that thermography is a valid diagnostic test.** The high court ruled in a unanimous opinion that insurance companies should be required to reimburse claimants for the procedure.

Thermographic imaging is used across the country in prestigious institutions, such as the Johns Hopkins University School of Medicine; Georgetown University of Medicine; Cedars-Sinai Medical Center; Tulane University; and the University of Medicine and Dentistry of New Jersey to name a few. Overseas, it has also been used at the Louis Pasteur Institute in Paris; University of Copenhagen; Verona University Hospital

(Italy); and the Yeshiva University Medical School in Tel Aviv. The weight of evidence clearly supports thermography as a valid scientific diagnostic modality.

Although thought of as somewhat controversial in the past, the latest documentation reviewed on thermography is overwhelmingly positive on its efficacy. In fact, the American Chiropractic Association states in its '98-'99 membership guide on page 262:

High resolution infrared (HRI) Imaging (electronic infrared thermography) is a diagnostic procedure which measures skin surface temperature. It is germane to chiropractic practice in cases where physiologic tests required for the diagnosis of selected neurological and musculoskeletal conditions.

High resolution infrared imaging requires a high level of operator and interpreter competency and an adherence to established and consistent protocol.

The results of high resolution infrared imaging must be properly correlated with a thorough history, an appropriate clinical examination, and other diagnostic studies/tests as may be indicated by clinical necessity. In this setting, high resolution infrared imaging may be an aid in establishing differentiated diagnosis and in determining a prognosis.

The treating doctor shall certify as to the medical necessity of the thermographic study based upon a diagnostic clinical question and the effect of the results on case management decisions. The referring doctor shall certify to the medical necessity by prescription.

HRI imaging is of value in the diagnostic evaluation of patients when clinical history suggests the presence of one of the following situations:

1. Early diagnosis and monitoring of reflex sympathetic dystrophy syndromes.
2. Evaluation of spinal nerve root/fiber irritation and distal peripheral nerve fiber pathology for detection of sensory/autonomic dysfunction.
3. To evaluate and monitor soft tissue injuries, including segmental dysfunction/subluxation, sprain

and myofascial conditions (strains and myofascial pain syndromes) not responding to clinical treatment.

4. To evaluate for the physiological significance of equivocal or minor anatomical findings seen of Myelogram, CT and/or MRI.

5. To evaluate for foreign disorders.

Because of the detailed knowledge, training, and skill level required, thermographic studies ordered, produced or interpreted by chiropractic physicians must be reviewed by only a licensed chiropractor who holds appropriate credentials with regard to knowledge, skill and experience in thermography. Only licensed chiropractors holding such credentials can claim sufficient competence to make valid judgments of comments regarding appropriateness, necessity, or accuracy of thermographic studies, and their relevance to chiropractic case management.²⁰

Thermography is clearly a valuable test when used appropriately. Patients should have the right to have this test performed when necessary to aid in diagnosis and management to the same extent as other tests such as MRI, CT, bone scan or x-ray. Its efficacy is clearly evident in the volume of research articles that have been written. I believe that electronic infrared imaging, when used under mandated guidelines and protocols, is an invaluable test to have in the arsenal of diagnostic modalities. It would be a tragedy to lose the ability to utilize this in medical/chiropractic practice.

For more information about the usage in practice and certification to read thermograms, contact the International Thermography Society, Dr. Beth-Ann Loveless at 815-667-4819, or log onto <http://www.thermography.org>

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[IMAGE]

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