

Infrared Screening / Medical Thermography

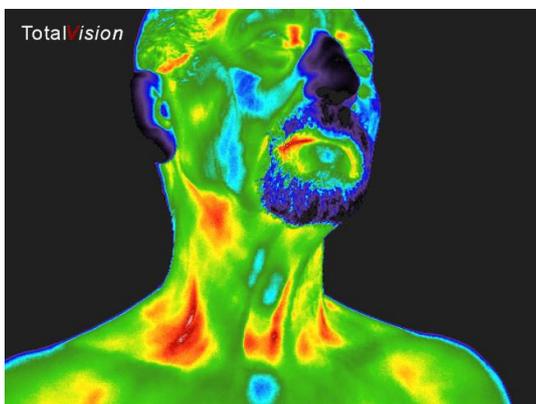
Specialized anatomy software for Medical Thermography.

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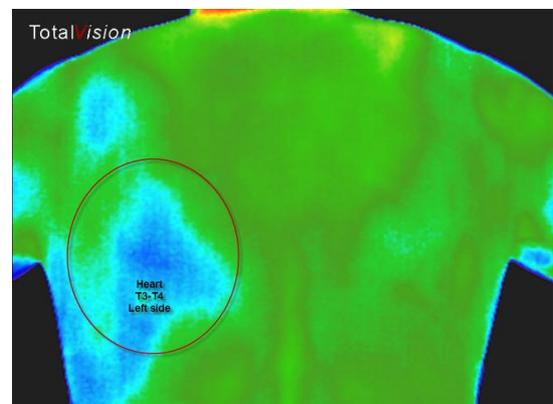
Hippocrates, the founder of modern medicine, already described some centuries ago that if a difference in temperature on the human skin is found, a pathological abnormality is probable. He smeared a thin layer of wet mud on his patient's body for the purpose of investigating areas that dried first.

How to see temperature differences?

Infrared Screening or Medical Thermography is based on the measurement of the skin's surface temperature. This temperature is dependent on the blood circulation in the outer millimeters of the skin. This blood flow is subject to complex regulation by the nervous system and local factors, therefore it is not possible to "see" the condition of the internal organs with infrared screening but rather pathological processes such as tumors, inflammation or tissue damage etc., as these processes have an impact on the parent skin. The underlying processes lead to vascular and nerve reactions which can be displayed as different heat patterns (thermograms) by means of infrared screening.¹



Thermogram of a patient with hypothyroidism and inflamed carotid artery.



Thermogram of a patient with a clinical proven heart defect.

Infrared screening can be widely applied in both primary and secondary health care. With infrared screening, the primary care physician will be able to better and faster assess the patient's situation or severity of the complaints while the secondary health care specialist will obtain better understanding of underlying processes within his medical specialty field.

History Infrared Screening / Medical Thermography

The first technical thermography experiments date from 1957. In the footsteps of Hippocrates it was confirmed that the skin temperature of a superficial tumor is higher than the temperature of the surrounding tissue.²

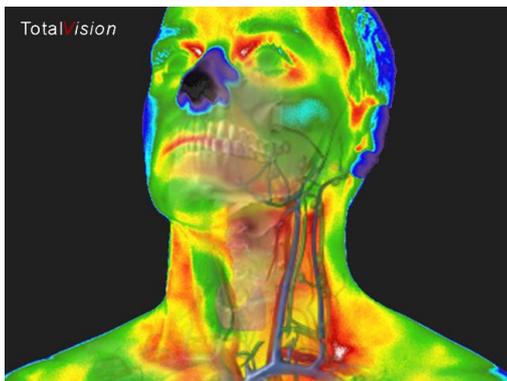
Earlier studies were done by cooling of a skin area first and then the continuous taking of images in a heating phase. The cooling was performed with cold water or a fan. This investigation technique is called Dynamic Infrared Thermography. It is based on the phenomenon of Raynaud, where the warming of a cooled skin area for an unhealthy person lasts longer and shows another characteristic pattern than that observed in healthy people.³

Due to working with low resolutions and very limited temperature sensitivity it was difficult for medical thermography to be accepted by conventional medicine (evidence-based medicine). However, thanks to the rapid technical development of infrared cameras and (anatomy) software, more and more medical doctors worldwide are realizing that infrared screening is an excellent addition to the existing conventional screening techniques.

There are many areas in medicine where infrared screening can provide diagnostic information; rheumatology, dermatology, orthopedics and vascular dysfunction are some examples.^{4, 5} Also with burn wounds⁶, frostbite and non-freezing cold injuries⁷ and cancer⁸, the results are very interesting. Pre-operative, in particular in transplantation- and plastic surgery medical thermography is already clinically used.^{9,10,11}

Meanwhile, research in different countries demonstrates that the initial shortcomings of the procedure, especially in terms of sensitivity and specificity in cancer diagnosis, have improved significantly.^{12, 13}

Extensive research in the last decade has contributed to increasing awareness of the use of this technology in both human and veterinary medicine.^{14, 15} Technological advances have initiated a trend towards valid and reliable criteria for the interpretation of medical thermograms by properly trained medical doctors and has therefore led to more accurate diagnostics.^{1, 16}



Thermograms with TotalVision[®] Anatomy Software

Energetic Health Systems brings unique, patented anatomy software and high-quality infrared screening cameras to the market. They also provide very extensive and specific medical thermography training together with access to a global knowledge network of universities and medical doctors which already apply their systems.

For more information please visit www.infraredscreening.com

What makes thermography different?

"An ounce of prevention is worth a pound of cure", Benjamin Franklin

By nature, humans integrate new information by relating it to what they already know or their existing beliefs. Since thermography is uniquely suited to observing dynamic physiological changes on the body, it is a compelling screening tool. As we know, the giant of all accepted screening tools is the x-ray. Therefore, it is a natural tendency to compare infrared screening to x-ray screening. However, besides being a human screening tool, the two do not have much in common.

There are three very basic differences:

1. Medical Thermography is highly sensitive but less specific while the x-ray is not sensitive but more specific.
2. Medical Thermography is best at observing dynamic physiological changes while x-ray can only observe anatomical manifestations, usually in advanced stage.
3. Medical Thermography makes non-invasive observations on the surface while x-ray requires an invasive, hazardous form of radiation to observe certain conditions in the interior of the body.

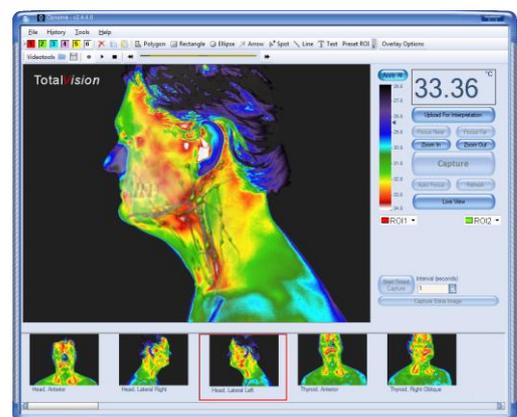
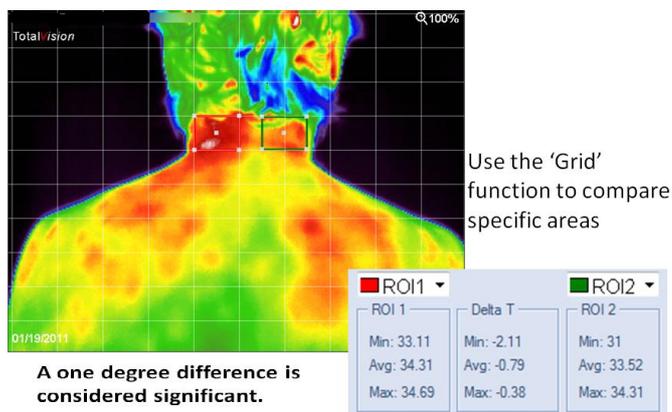
A metaphor that describes the two is the difference between "What are you DOING?" as compared to "What have you DONE?"

Infrared Screening or Medical Thermography is so sensitive that it can detect slight, dynamic temperature changes (0,05°C) on the surface of the skin. The skin is the body's central communication hub for the network of interconnections between all body systems. The skin has the information and the infrared screening software can tell the story as it is happening.

Therefore infrared screening is so sensitive that it can answer the question "What are you DOING?" It can observe the location of activity, which is useful information if early indication is valuable, but it is not specific for a definitive diagnosis. It then offers the opportunity to investigate with focused guidance. This is more valuable and beneficial if prevention or wellness is the goal.

X-Ray is not at all sensitive enough to detect dynamic physiological changes and therefore can generally better answer the question "What have you DONE?" The X-Ray device can detect the final manifestation of disease, the stage where disease management is required, which is more specific, but not as beneficial if prevention is the goal.

In addition, infrared screening has shown to be a better tool when following and monitoring healing processes.



Thermograms with TotalVision® Anatomy software

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