Medical Thermal Imaging Disease Monitoring

The ability to detect problems early on is a tremendous advantage that is gained through technological advances in the medical imaging field. Diagnosing patients is becoming easier & less intrusive. Most medical imaging methods, however, are becoming increasingly expensive. Medical thermography is one of these technological advances & provides a diagnostic medical imaging procedure that is non-invasive, objective, & relatively inexpensive.

Multiple sclerosis

Thermal Imaging Cameras can be used for a variety of disease monitoring, trending, and medical applications. We have several medical thermal images, this series is of a patient suffering from multiple sclerosis. As easily identified in these thermal images, Multiple sclerosis causes poor circulation and blood flood to the extremities.

"Multiple sclerosis (abbreviated MS, also known as disseminated sclerosis or encephalomyelitis disseminata) is an autoimmune disease in which the body's immune response attacks a person's central nervous system (brain and spinal cord), leading to demyelination. Disease onset usually occurs in young adults, and it is more common in females. It has a prevalence that ranges between 2 and 150 per 100,000. MS was first described in 1868 by Jean-Martin Charcot.

MS affects the ability of nerve cells in the brain and spinal cord to communicate with each other. Nerve cells communicate by sending electrical signals called action potentials down long fibers called axons, which are wrapped in an insulating substance called myelin. In MS, the body's own immune system attacks and damages the myelin. When myelin is lost, the axons can no longer effectively conduct signals. The name multiple sclerosis refers to scars (scleroses—better known as plaques or lesions) in the white matter of the brain and spinal cord, which is mainly composed of myelin. Although much is known about the mechanisms involved in the disease
process, the cause remains unknown. Theories include genetics or infections. Different environmental risk factors have also been found.

Almost any neurological symptom can appear with the disease, and often progresses to physical and cognitive disability and neuropsychiatric disorder. MS takes several forms, with new symptoms occurring either in discrete attacks (relapsing forms) or slowly accumulating over time (progressive forms). Between attacks, symptoms may go away completely, but permanent neurological problems often occur, especially as the disease advances.

There is no known cure for MS. Treatments attempt to return function after an attack, prevent new attacks, and prevent disability. MS medications can have adverse effects or be poorly tolerated, and many patients pursue alternative treatments, despite the lack of supporting scientific study. The prognosis is difficult to predict; it depends on the subtype of the disease, the individual patient's disease characteristics, the initial symptoms and the degree of disability the person experiences as time advances. Life expectancy of patients is nearly the same as that of the unaffected population."

Article Reprinted from Wikipedia

*Images taken with JCI 7320 P Thermal Imaging Camera*
Breast Thermography - Cancer Screening Oncology

Breast thermography is a clinical diagnostic procedure which uses highly specialized infrared thermal imaging cameras to measure the heat coming from the body, in this case, the breast. Thermography has been approved for this purpose for many years by the US FDA (United States Food and Drug Administration) and in the past two years (2001-2002) many new doctors and technicians have entered the field.

Breast thermography is very accurate, but only in the hands of trained personnel using the correct type of thermography cameras. The accuracy of the examination varies around the world but varies from 87%-96% depending on old the literature is. The 96% reference is from 1999, the most recent published approved study. (USC Norris Cancer Center, Parisky, MD et al)

These images are of a 51 year old woman with invasive cell carcinoma. Prior to her finding the mass, she had 18-20 mammograms, she never smoked, took BC pills for four years, she has three children and no family history of BCA. Infrared images were taken by an ICI 7320 ETI P-Series camera system.
Deep Vein Thrombophlebitis

"Thrombophlebitis is phlebitis (vein inflammation) related to a blood clot or thrombus. When it occurs repeatedly in different locations, it is known as "Thrombophlebitis migrans" or "migrating thrombophlebitis". Thrombophlebitis is related to a blood clot (thrombus) in the vein. Risk factors include prolonged sitting and disorders related to blood clotting. Specific disorders associated with thrombophlebitis include superficial thrombophlebitis (affects veins near the skin surface) and deep venous thrombosis (affects deeper, larger veins). Thrombophlebitis migrans can be a non-metastatic manifestation of pancreatic carcinoma (Trousseau sign of malignancy)."

article reprinted from Wikipedia

Migraine Headache

"Migraine is a neurological syndrome characterized by altered bodily perceptions, headaches, and nausea. Physiologically, the migraine headache is a neurological condition more common to women than to men. The typical migraine headache is unilateral and pulsating, lasting from 4 to 72 hours; symptoms include nausea, vomiting, photophobia (increased sensitivity to bright light), and hyperacusis (increased sensitivity to sound); approximately one third of people who suffer migraine headache perceive an aura — unusual visual, olfactory, or other sensory experiences that are a sign that the migraine will soon occur."
Dental Thermal Imaging - Focal Tooth Infection

While Dental Thermography hasn't grown as fast as general medical thermography, there are still many uses and unexplored avenues where using thermal imaging in dentistry can be very beneficial in spotting certain ailments and abnormalities. Here we have images of 2 focal tooth infections.

"A focal infection is a local infection (affecting a small area of the body) that causes subsequent infection or symptoms in other parts of the body. For example, tetanus (lockjaw) is caused by the release of exotoxin from a local infection, perhaps an infected puncture wound of the foot.

The theory of focal infection is associated with dentistry, linking local dental infections to systemic conditions of the circulatory, skeletal, and nervous systems. It is thought that these conditions can be caused by the dissemination of microorganisms or toxic products from infected teeth, teeth roots, gum tissue, and/or tonsils."

Article reprinted from Wikipedia

Veterinarian Thermal Imaging

Explored for decades, veterinary applications, such as equine thermography, are gaining credibility as a valid diagnostic tool. Infrared imaging has become widely used in veterinary applications such as equine thermography. With any veterinary thermography application, infrared cameras are used to show an abnormality in tissue that's stressed, before any damage is done to the animal.
**Disease Monitoring - Viral Infections**

Infrared and thermal imaging cameras are vital tools for controlling an outbreak of swine flu or any other viral infection. They are very useful and can be used in many areas where large amounts of people are passing by. Besides airports they could be used in train stations, subways and building entrances. These Cameras are vital tools in today’s age when viruses are mutating at an ever increasing rate and the ease of long distance travel puts the entire species at higher risks from worldwide epidemics. Hopefully at least in part due to Thermal imaging cameras we will be able to curb and control the swine flu and all future outbreaks of dangerous and deadly viral diseases.