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What is Thermography ***Thermography in Breast Cancer Detection***

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Thermography is exceptional in detecting breast cancer within the first year of development, as well as detecting and recording more advanced stages of breast malignancy. Infrared imaging shows subtle and dramatic temperature differences that correlate with various types of breast pathology. Thermal imaging is also of great value in monitoring the effectiveness of treatment.

Thermography is different than other invasive techniques, such as mammography and x-ray that penetrate the body with harmful radiation, whereas thermography is non-invasive and radiation free. Most other diagnostic equipment detects anatomical issues, but thermography investigates physiological patterns. The thermogram, using proper protocol, detects changes in the skin microcirculation as a result of temperature and chemical changes. (13)

The skin is the largest organ of the body and contains approximately 25% of the body's blood. The skin measures about 21 square feet in an average adult and accounts for 15% of body weight. One of the skin's primary roles is protection from environmental temperature change. The skin's temperature controlling mechanism has a unique and distinct microcirculation that 1) distributes the thermal excesses produced in the body, and 2) protects the thermal needs by adjustment of the circulation. (11)

Thermographic examinations are performed in a controlled 20°C or 68°F ambient room to challenge the body, noting a neutral normal skin temperature is 30°C or 86°F. The microcirculation of the skin is under the control of the sympathetic nervous system and the colder temperature causes a "fight or flight" response to occur. This, in turn, causes the cutaneous blood vessels to constrict forcing blood inward to the muscles and vital organs as a protective response.

The nitric oxide that is present, as a result of malignant tumor development, does not allow the blood vessels to constrict near the tumor. Only the normal vessels constrict and the abnormal vessels tend to remain dilated when challenged with the cold-water hand soak. The main purpose of a second, or comparative study, is to determine the functional physiological response to a cold-water challenge. Temperature changes measured from first to second studies provide one of the most important factors for evaluation of the breasts.

Clinical experiments by Draper, indicate that only heat brought to within 6mm (~¼") of the surface of the dermis is emitted. Thermography only detects heat within this range (skin microcirculation).