

THE ROLE OF COMPUTERIZED INFRARED DIGITAL THERMOGRAPHY IN ASSESSING BREAST HEALTH WITHIN NATUROPATHIC PRACTICE

BREAST HEALTH ASSESSMENT METHODS

Women share varying opinions, views, concerns and fears about how to assess their breast health. More and more younger women are being diagnosed with breast cancer and, unfortunately, many of these women (25 per cent) experience untimely death. (1) For women, 26 per cent of all cancers occur in the breast. For men, breast cancer represents 0.2 per cent of all cancers and is often overlooked as a possibility until the disease is quite progressed. (1)

The current traditional tools of assessing breast health include mammography, MRI, ultrasound and breast self-exam. These modalities look for structural changes or lumps in the breast tissue. An emerging method for assessing breast health is Thermography. It is used to monitor the *function* of breast tissue, detecting breast tissue changes five to eight years before the development of a mass large enough to be seen with mammography or ultrasound or be felt in an examination. (2)

The word *thermography* refers to the taking of the infrared images and the word *thermology* refers to the analysis of those images by a specifically trained and experienced reader. (Qualified Thermologist is the current standard of certification as set by the American Board of Thermology or AAT.) The thermologist uses an objective analytical process called the Marseille System, which has been refined by integrating enhanced knowledge of basic science with clinical experience. Thermology reports are graded from TH-1 (normal) through to TH-5 (severely abnormal). These numbers do not relate to the numbering system to grade breast cancer.

A reading of TH-3, -4 or -5 is not a diagnosis of breast cancer. It does provide an objective means of evaluating features of risk related to malignant disease and it indicates the need for comprehensive evaluation. Such evaluation involves a thorough ultrasound to the specific sites found with thermography and then, if indicated, a mammogram for tumour verification. If a tumour is found, then a biopsy is needed to confirm the diagnosis of malignancy. While observation, palpation and imaging can suggest a diagnosis of cancer; a final confirmed diagnosis is not possible until a pathologist performs a histological evaluation of a biopsy.

THE BASIS FOR THERMOGRAPHY

Human skin, irrespective of its pigmentation, is an excellent emitter of infrared energy (metabolically produced heat). The intensity of infrared energy emitted is in direct proportion to skin temperature. The emission of infrared energy from the skin is superficial, with skin temperature principally affected by changes in the small blood vessel circulation.

Normal blood vessels have smooth muscle in them and are therefore under the control of the autonomic nervous system (ANS). During a cold water challenge to body tissues, the ANS will signal the smooth muscles in the small blood vessels to

contract and redirect the majority of the blood into the centre of the body.

Skin temperature also reflects the metabolic character of underlying tissues as the energy of these underlying tissues will 'float' to the skin's surface and present an infrared 'character' that is distinctive for each anatomic site. This is why thermography studies cannot be scanned for the entire body at one time and are taken for specific body parts separately i.e. breast, thyroid, spine, knee, etc. Each area or tissue type has specific criteria for interpretation according to a standard professionally set by the AAT.) Before a malignant adenoma tumour forms, there are early changes in the regional blood vessels caused by the nitric oxide production of dysplastic cells. This vasodilation is resistant to normal regulation by the ANS and these characteristics can be visualized by thermology.

By the time a malignant tumour has grown to just one-fifth of a millimetre in diameter, it must have a new means of perfusion. This need is met by the development of distinctive and structurally abnormal blood 'vessels' termed neo-angiogenesis. These newly developed and abnormal blood 'vessels' are more akin to a very porous tissue than a normal three-layered blood

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vessel and have no vascular smooth muscle or innervations to the ANS. The neo-angiogenic vessels are incapable of a normal and adaptive constriction when the ANS responds to a cold challenge. They stay dilated and warmer while the normal blood vessels constrict and become cooler. The tumour continually takes all the blood and its nutrients that it can get to grow as quickly as possible no matter what the rest of the body is doing. These areas thus receive a high volume of blood flow unrestricted by the ANS, producing high infrared energy (heat) in the region of a malignant tumour. It is the high infrared energy in complex vascular patterns that is resistant to ANS-modulated vasoconstriction that characterizes malignant breast tumours in digital thermology. (3)

THE THERMOGRAPHY EXAMINATION

Under controlled conditions, a trained technician uses a specialized, medical infrared video camera and sophisticated computer software to take pictures and then save them on a computer. Three images are taken: – front, left and right sides of the chest – with the arms positioned over the head so that the entire area of both breasts and armpits are included. The hands are then submerged in 11°C water for one minute. Then the same three infrared pictures are repeated.

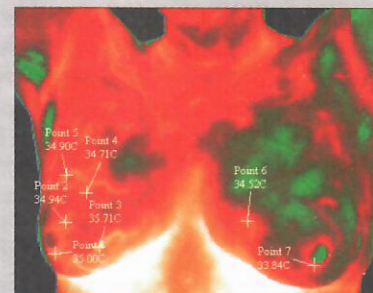
Placing the hands in cold water is the intentional challenge to the ANS, which causes the normal blood vessels with smooth muscles to contract. In normal breast tissue, this vasoconstrictive effect is uniform throughout both breasts and the skin surface temperature drops uniformly.

A certified thermologist analyzes the scans and produces a thermology report (Fig. 1). The pre- and post-cold challenge images are compared to evaluate the change in temperature reflecting the degree of vasoconstriction that occurred in the tissues in terms of symmetry, pattern and energy level. The picture and information provided in the thermology report assists the individual and her health practitioner(s) in targeting proactive breast health care. By assessing breast health in relationship to hormone balance, toxicity, immunity and general health, naturopathic doctors can provide real preventive care – a role that NDs are uniquely trained to provide.

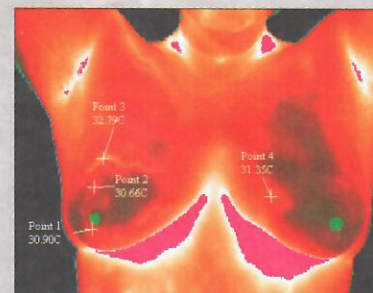
ANALYSIS OF BREAST THERMOLOGY

SAMPLE PATIENT – FOR MEDICAL THERMOGRAPHY INTERNATIONAL

BACKGROUND: Six high-resolution digital radiometric infrared images were made to include the anterior and the right and left lateral aspects of the thorax to feature the breasts. Three of these images were made immediately after the patient withdrew both hands from one-minute immersion in cold (approx. 11°C) water. This provides an autonomic challenge and a response of sympathetic-driven constriction from normal superficial blood vessels with consequent cooling of the skin. This challenge is intended to contrast and thus distinguish any non-responding blood vessels such as the nitric oxide-dilated and neoangiogenic blood vessels reliably associated with solid malignant neoplasm. Notice is made that this patient's related history includes a strong familial and a strong personal risk factor(s) for breast malignancy. The patient's related history includes no symptom(s) frequently associated with breast disease. This patient has five (5) (the first three as TH-3) studies of prior data available for comparative analysis.



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DATA: The thermographic presentation demonstrates no patterns considered significantly abnormal. Specifically, no thermal features of irregular, large caliber and prominent vascular-like character; significantly hyperthermic foci; asymmetric whole breast hyperthermia or altered physical configuration are discerned in either the right or left breasts. Diffuse and significantly hypothermic patterns are seen in both breasts. Additionally, post-challenge images demonstrate symmetrical and uniform attenuation in emission levels from the vascular-like features seen from both breasts. Comparative analysis demonstrates a marked decrease in the extent, caliber and relative emission levels from the atypical vascular-like features in the right breast.

IMPRESSION AND DISCUSSION: Quantitative analysis of this data indicates no thermology signs or criteria with established association for malignant disease in the right or left breast. However, several distinctly hypothermic features are discerned in the right and left breasts that do provide an indication of fibroadenoma cysts. Annual thermology restudy is recommended for comparative analysis.

SUMMARY: Normal breast thermology; graded TH-1F. Thank you for your referral.

A breast thermology examination has an accuracy rate of 88 per cent in detecting changes in breast tissue function but is less specific in differentiating the cause of the change and further investigation is then indicated. This is approximately the same as mammography but the two methods of screening do not overlap in their findings. Thermography detects *functional* changes up to 5-8 years before the development of a mass, a *structural* change, which is large enough to be seen with mammography or ultrasound or be felt in an examination. (4)

Tissue inflammation or infection may cause false-positive findings, especially on an initial study of an individual. A false positive means a problem was indicated when it really was a unique, but normal, finding for that individual woman. A false positive may also occur when there is a unique personal variant that is a normal finding for that individual. Then, on repeated thermology studies, the personal variant remains the same and can be distinguished from significant disease.

False-negative errors are rare and are usually a consequence of a latent (resting, non-active) stage in the development of a malignant tumor. Once formed, tumors are generally in a growth phase although occasionally some may have a short quiescent or resting phase before they resume growing. The main means of addressing this is to establish routine thermography screening where it would be possible to monitor patients through time and often enough to catch a developing tumor in a growth phase.

USING THERMOGRAPHY IN CLINICAL PRACTICE

Women who choose thermography exams want to be proactive about their breast health and appreciate a referral to a naturopathic doctor to determine the underlying causes of breast dysplasia. By seeing a ND they learn that their breast dysplasia is the manifestation of various other biochemical, structural and energetic dysharmonies affecting their hemodynamics. In this way, the woman can change functional problems long before they become a mass of cancer cells that have structure.

Using clinical and laboratory examination, the ND focuses on assessing a wide range of probable causes contributing to breast dysplasia. A personalized health plan can then be designed for each individual to address the various layers of dysfunction.

In mild cases of breast hyperplasia, with a thermology reading of TH-2, the focus of therapy is on the hormonal imbalances affecting the benign cystic nature of the breast. In TH-3, -4 and -5, in addition to hormonal imbalance, deeper problems of toxicity, drainage, stress response and environmental pollution factors must be considered. A blend of many modalities of naturopathic therapy are appropriate to utilize such as nutrition, homeopathy, counselling, nutrient supplementation, traditional Chinese medicine, acupuncture, detoxification, external botanical compresses, and skeletal manipulation to affect the nerve innervation and structure. Special mention should be made about receiving a breast massage from a registered massage therapist trained in this specific form of massage. Breast massage is beneficial for improving the microcirculation and lymph drainage of the entire breast and chest wall area and is always appropriate for TH-1 & TH-2 readings for preventive purposes. For readings

of TH-3, 4, & 5, breast massage should be used when recommended by the health practitioner and the results monitored by follow-up thermography scans.

Clients should be advised to wear bras that fit correctly and do not constrict with wires or overly compress the breast tissue against the chest wall. Performing frequent breast self-exams is critical for both men and women. Results of breast dysplasia of TH-3, 4 or 5 would indicate the need for more targeted testing with ultrasound and mammography along with the above methods to assist in regaining breast health.

When using therapies to improve breast dysplasia, changes in thermography results can be expected as soon as three months or, conversely, it may take two to three years to see significant changes. Each case is unique and the hemodynamics of each person's physiology must be considered when applying therapy. Thermography is the evaluation tool that can track the changes.

CONCLUSIONS

Infrared digital thermography is not a replacement for mammography. It is a valuable first step assessment tool that can be done on anyone at any time after puberty. Breast thermology is most effective on a population where mammography is rather insensitive (premenopausal, pregnant, lactating, fibro-cystic disease, prosthetic augmentation, surgical reduction, dense breast tissue, large and small breasts, post-menopausal women taking hormone replacement therapy and for men).

Thermology can be used in evaluating the effectiveness of anti-angiogenic therapies and in monitoring post-surgical changes in tissue as in the healing of scars after mastectomies or lumpectomies. Reports suggest that breast thermography may be most useful during the early phases of rapid tumour growth, especially those not yet evident on clinical exam or mammography. (2)

Patients scanned with thermography will display a unique infrared map. Routine monitoring is recommended on a yearly basis for women who display a reading of TH-1. Changes from the individual's normal profile of TH-1 may point to early detection of abnormality and guide other early investigations. In this way, thermography is useful when interpreted along with clinical findings by a practitioner, both ND and MD, with expertise in ultrasound, MRI and mammography.

The major advantage of thermography is its ability to safely monitor breast pathophysiology at frequent intervals without using radiation, compression, contact or intravenous access. It is useful for all types of breast tissue at all ages: – young, dense, pregnant, fibrocystic, breast implants, HRT and men.

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FURTHER READING:

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- 2) www.thermascan.com – articles and sample scans by Dr. Phil Hoekstra III Ph.D. of ThermaScan Inc.

S I D E B A R: Questions and Answers

When a health care practitioner asks a woman during a health care consultation if they have, or have ever had, any problems with their breasts most, say 'no'. However, if a health practitioner asks more specific questions, such as those listed below, he or she will find that most women have absorbed messages about their bodies that may not be conducive to good health.

Q: 'Have you ever had breast pain?'

A: 'Yes, but that is normal.'

Most women have experienced breast pain over long periods of time. The most common type of breast pain women think of is premenstrual breast pain. While this is common, it is not normal and could be a signal of dysfunction. In consultation with clients, health practitioners must ask specific questions about their clients' breasts in order to elicit more information. For example, ask about the history of breastfeeding and mastitis, trauma to the breasts, ribs or spine, family history and exposure to toxins.

Q: 'Do you feel comfortable in your bra?'

A: 'No, but that is normal. I just ignore it.'

Too many women are conditioned to wear underwire bras. These bras tend to push breast tissue against the chest wall. Also, breasts do not naturally grow in the shape of many bras. This is of particular concern for many large breasted women whose breast tissue extends under their armpits towards their shoulder blades. Undue pressure from a bra can cause constriction in the lymph flow, which should be draining the end products of metabolism and toxins out of the breasts. There can also be strain on the musculoskeletal structures of the spine, ribs and arms with constricting bras.

Q: 'Do you personally experience your breasts as an integrated part of your body, like your elbow, your eyes, etc.?'

A: 'I don't know what you mean?'

Many women see their breasts in one of three ways: for feeding a baby, for someone else's sexual pleasure, or as a potential site of cancer! Breasts are like a 'blackout zone' in their internal body sense and they are only concerned about

how their breasts may appear or, alternately, how to get them to disappear. A health practitioner can help them begin to discuss concerns they have about their breast health.

Q: 'Do you engage in healthy breast practices?'

A: 'Yes, I do a self-exam.'

This is very good AND there is much more that you can effectively do to care for your breasts. After breastfeeding, women need professional help to drain their breasts and realign their musculoskeletal system. Specific therapeutic breast massage can assist women throughout their lives to maintain healthy breast tissue.

Q FOR MEN: 'As a man, have you noticed any changes or pain in the tissue in the breast area of your chest?'

A: 'No, can that happen?'

Health practitioners must enquire and examine men as well as women because men get breast cancer too.

The major advantages of thermography are its ability to safely monitor breast pathophysiology at frequent intervals without using radiation, compression, contact or intravenous access. It is useful for all types of breast tissue at all ages: young, dense, pregnant, fibrocystic, breast implants, HRT and men.

Thermography can also be used to assess thyroid gland function, superficial lymphatic centres, soft tissue injuries, dental infections, neurological function and circulatory function throughout the body.

To view sample scans see www.thermascan.com.

Medical Thermography International Inc. was founded in 2001 with the primary focus of first step breast screening through outreach clinics. The company's purpose in doing outreach clinics is to make this proactive method of breast health assessment easily available to everyone.

Medical Thermography has held clinics throughout Canada. Ongoing clinics are held in Toronto and many other cities and the information about them or how to hold your own outreach clinic can be found on the web site www.medthermonline.com or by phoning 1-866-242-5554.