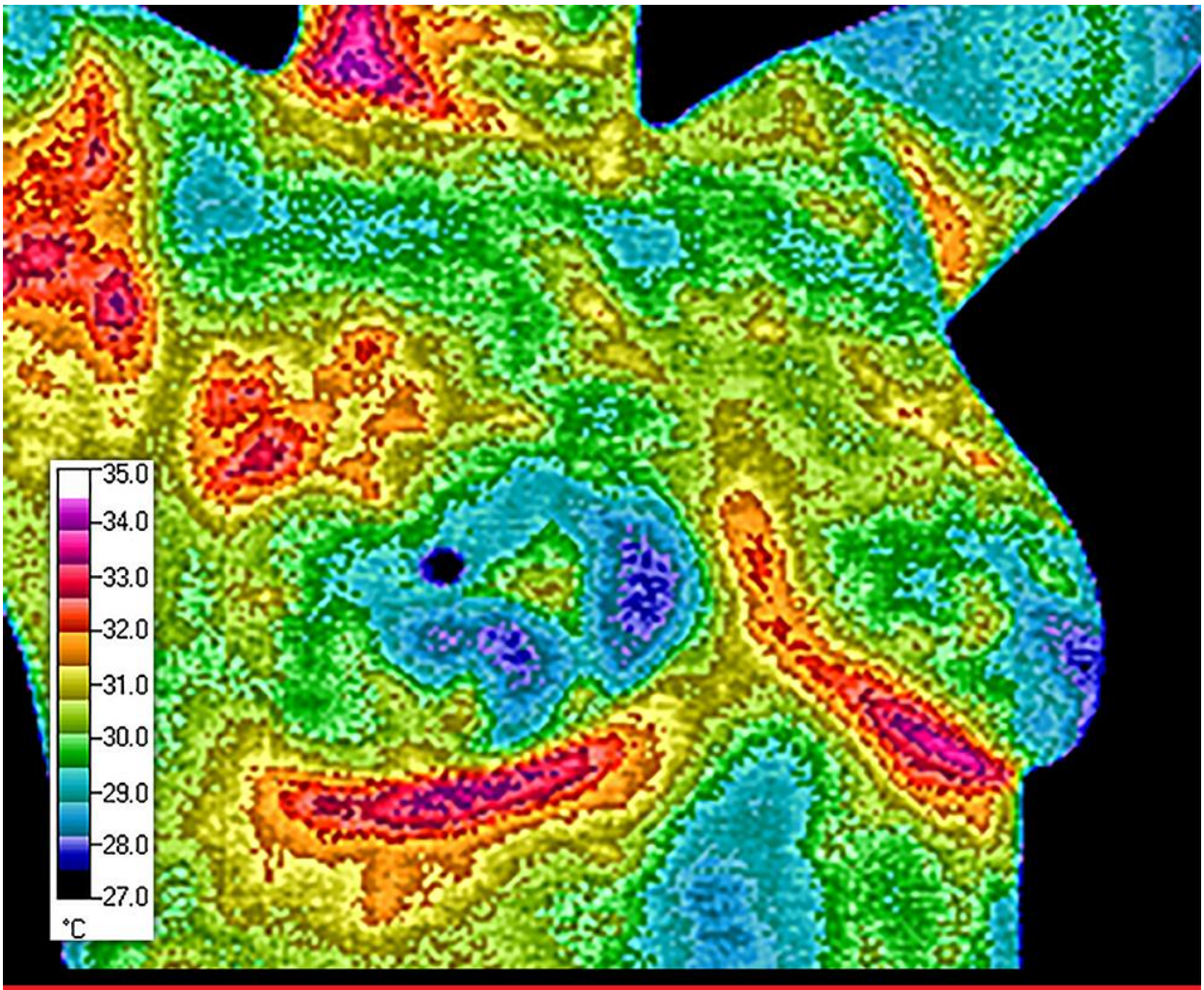

Breast Thermography

What every woman must know before having a breast thermogram

Safety • Accuracy • Effectiveness • Pros & Cons

Breast Thermography

What Every Woman Must Know Before Having a Breast Thermogram

Michael Wedge, L.Ac., M.Ac.O.M., DCH

Board Certified Clinical Thermographer

Acknowledgements

I would like to thank the late Dr. Bill Cockburn for my formal education in clinical thermography and the years of mentoring he provided.

I would also like to thank the many women who have allowed me to provide them with breast thermography services over the years; because of you, I have continually improved my skills in this field and this has allowed me to, in turn, help many other women, both directly and in the training of others, in thermography.

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Foreword

Please note this book is best viewed with a device capable of producing a color image. This is necessary to see several of the thermogram images used in this book.

You may have noticed there is a growing interest in breast thermography as a viable method of screening for evidence of breast cancer. Articles have been published in more than one women's magazine, breast thermography has received endorsements from physicians with some name notoriety and advertising for breast thermography is being seen more and more frequently. It is not my intent to provide an exhaustive assessment of the science and clinical applications of thermography, but rather to create a simple introduction to the benefits and limitations of clinical thermography and, more specifically, breast thermography.

Why is this needed? Breast thermography has been and continues to be very controversial. In my opinion, this is not due to the practice being as much questionable as it is due to misinformation and misunderstanding both within the medical community and in the public. Sadly, those that are misinformed continue to propagate this misinformation which results in many women (and men) not utilizing this safe technology. It is worth pointing out that misinformation comes not only from those outside the field of clinical thermography, but also from those within the field.

Just as there is controversy over breast thermography, there is considerable controversy over the use of mammography. Some studies show little or no benefit from mammography and others show considerable benefit. Some studies show the primary window of benefit, as measured by improved survival rates, from screening mammography is between the ages of 50 – 69. We know that mammography is less effective in women with denser breasts, a problem that is more common in younger women. It has been argued that mammography, itself, is carcinogenic and the information provided from screening mammography is not worth the radiation exposure. Others argue the radiation is relatively low and is not much of a concern.

It is not my intent to analyze the validity or lack thereof, of any of these mammography studies. That is for you to decide together with your physician or primary care provider. I bring this up only to point out that controversy about a procedure does not invalidate its usefulness and to point out the obvious, that no screening or diagnostic method is 100 percent accurate. Therefore, thermography should be utilized with other breast assessment methods. Breast thermography was never intended to be the final word in breast health assessment, but it is an excellent tool in its own right. It is also important to understand mammography, at least at the time this book was written, is the standard of care for breast cancer screening. From the point of view of the FDA, thermography is considered an adjunctive screening method.

Due to the limitations of mammography, and no one denies there are limitations, breast thermography, in my opinion, offers women additional information both about the health of their breasts and problems that may lead to the development of a cancer, and presents evidence of potential underlying pathology.

I hope you find the information in this book helpful in your quest to remain healthy. If you find areas that are not clear, or you have questions that were not answered, please let me know so I can make the necessary improvement in the next edition.

Introduction

We all know someone who has or has had breast cancer. In fact, you probably know several women with breast cancer. Breast cancer is on the rise. In the 1970's approximately 1 in 11 women developed breast cancer, today it is 1 in 8 and approaching 1 in 7. Our clinic has seen women in their early 30's with breast cancer. Being diagnosed with breast cancer in your early 30's indicates the cancer was likely present when you were in your 20's. I feel strongly we can be proactive in reducing the incidence of breast cancer and increase a woman's chances of living life free of breast cancer. There are no guarantees that even if you do take all the correct steps in decreasing your risk you won't develop cancer, but one thing is for certain, using the "I have my fingers crossed" approach is not particularly effective.

The current standard of care for breast cancer screening is mammography. I have talked with quite a few women that faithfully obtained yearly mammograms as they had been instructed, and each year they were told there were no concerns, only to be diagnosed before the next yearly mammogram with a cancer that they were told has been growing for several years. You are probably aware of stories like this as well.

You might find it interesting that a study published in The British Medical Journal in February 2014, involving over 90,000 women, lasting over 25 years, showed no survival benefit with the use of screening mammography. Specifically, the study included women age 40 – 59. They were randomly divided into two groups, one group receiving yearly mammograms and the other group only clinical breast exams. The rate of diagnosis of breast cancer and the percentage of women that died were almost identical. There will no doubt be many who will disagree with the findings of this study, but it does point out the continued controversy over mammography.

This book is not about dissuading you from utilizing mammography, but rather my intent is to suggest that you consider utilizing an adjunctive assessment that can assist you in monitoring your breast health and look for evidence of pathology, including breast cancer that may have been missed through another assessment method; be it mammography, MRI, physical exam, etc.

Besides using thermography to aid in cancer screening, thermography plays an important role in being proactive in reducing your chances of developing a breast cancer. As I will explain in more detail later, I believe that breast health should be looked at as being on a continuum, with healthy breasts on the left side of the continuum, and cancer on the right side. As the breast becomes progressively less healthy, the further towards to right side of the continuum you will find yourself. It is very common, although not necessary, for women to complain of increasing

“benign” changes in the breast such as fibrocystic changes, significant pain and tenderness, etc., and then never address these issues because they are considered benign. These changes within the breast may not be directly precancerous, but they are an indication the breast is becoming progressively less healthy and this increases the chances of developing a cancer. The fact is, the vast majority or women I have seen with breast cancer have a history of increasing “benign” changes in their breast prior to being diagnosed with cancer. These changes can and should be addressed. Thermography should be a part of this process.

It is my hope in writing this book that women will adopt a new paradigm (more on this idea later in the book) with regards to how they look at their health, specifically breast health, as well as how they screen their breasts for abnormalities and cancer. We are all effected by breast cancer and I believe if we work together we can reduce the incidence of occurrence and when cancer is present, improve survivability by early detection.

What is Breast Thermography?

In 1972, the Department of Health, Education, and Welfare, released a position paper in which the director, Thomas Tiernery, wrote, “The Medical Consultants indicate that thermography, in its present state of development, is beyond the experimental state as a diagnostic procedure in the following areas:

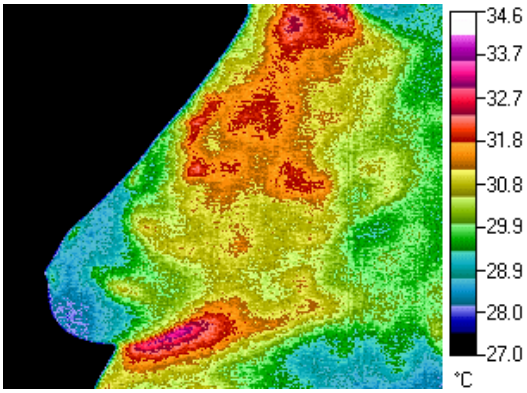
Pathology of the Female Breast

Extra Cranial Vessel Disease

Peripheral Vascular Disease

Musculoskeletal Injury

We are of course talking about breast thermography, but the use of thermography in the aforementioned areas is interesting in their own right.



A Bit of History

Thermography, in one form or another, goes back many years. A very quick overview of some of the highlights includes the following: Hippocrates noted that an area of the body where there was a clinical concern, when covered with mud, often times dried more quickly. This was of course a very brilliant observation. In 1800, Sir William Herschel discovered “infrared rays” and in 1840, John Herschel coined the term “thermogram.” In 1954, the first infrared imaging scanner was produced taking almost an hour to produce an image. In 1956, Ray Lawson, M.D. published a paper titled “Implications of surface temperature in Breast Cancer”. Since that time, the technology and science of thermal imaging has developed rapidly and today we have very sophisticated infrared imaging equipment.

Thermography, an Introduction

Just what is a thermogram? A thermogram is a recording of images produced by a thermal imaging camera. All objects in our universe with temperatures above absolute zero (a very chilly -273.15 degrees Celsius / - 459.67 degrees Fahrenheit) emit energy and the energy in the infrared spectrum is what is recorded by an infrared thermal imaging camera. Let's break this apart so it makes more sense.

You are undoubtedly familiar with the term mammogram, cardiogram, etc. These are all tests that record the results of a particular bodily function or part. The "mammo" in mammogram is derived from the word mammary which refers to the breast. "Cardio" in cardiogram refers to the heart, and "thermo" in thermogram refers to heat. The suffix "gram" refers to a recording. So, a thermogram is the recording of heat being emitted from an object. This heat can be emitted from a human body, an animal, a building, or any other object above absolute zero. Absolute zero is the temperature believed to be the lowest temperature obtainable and is the point where there is no heat energy remaining in the object. Ok, so far so good. One other piece of information is necessary to understand thermograms.

A thermographic camera picks up and records heat in the infrared spectrum. So just what is the infrared spectrum? Infrared (IR) light is part of the electromagnetic spectrum that is not visible to the eye. The only way to see IR light is with specialized equipment. In the case of medical thermography, the equipment is a thermal imaging camera that is adjusted to optimize its capability of seeing IR light in the range emitted by the human body. As an interesting side note, IR radiation (this is not ionizing radiation like you would be exposed to from an x-ray, but rather a harmless part of the electromagnetic spectrum) was discovered by William Herschel in 1800. Pretty smart guy I would think.

Ok, now you know everything you need to know, and more, to understand what a thermogram is.

Breast Thermography

Breast thermography in one form or another has been around for decades. Breast thermography is effective (some may argue against this statement), but not 100 percent accurate for looking for evidence of breast cancer because of the nature of most, but not all, cancers. First, is the fact that cancer cells usually have a higher metabolic rate; second, cancer cells require a network of new blood vessel growth, known as angiogenesis, to feed the cancers growth; and third, cancer cells will dilate blood vessels feeding a tumor. Because of these characteristics of cancer, increased heat is produced, heat which is picked up by thermal imaging cameras.

It is important to point out that thermal imaging does not diagnosis a cancer, only a biopsy can diagnosis a cancer. Thermography simply identifies and records heat patterns which may

indicate a cancer or other pathologic condition.

Once an image has been captured by the thermographic camera and stored in a computer, it must be read. Reading a thermogram is also known as interpreting a thermogram. Initially the thermographic imaging procedure is completed by a thermography technician and the image is interpreted by the interp doc. The interp doc is the individual trained in reading a thermogram. This is analogous in function to a radiologist who reads traditional imaging such as an x-ray or MRI. The training is very different and becoming a radiologist is far more involved than learning to read a thermogram. My point is a simple one, it is not a radiologist that reads a thermogram. Radiologist are not trained in thermal interpretation in the course of their education. In order to read a thermogram, you do not need to be a medical doctor. In fact, even though you will occasionally see in an advertisement someone boasting that their thermograms are read by an MD, there is no benefit whatsoever in being an MD when it comes to reading a thermogram. There is of course a training program for thermographic interpretation.

When evaluating a thermogram, the interp doc looks for a variety of factors. These include the following:

Abnormal or atypical blood vessels or vessel patterns. Abnormal vessels may develop due to cancer, trauma, implants, and estrogen excess predominantly.

Temperature deltas. A temperature delta is the difference in temperature between two measured areas. For example, if the difference in temperature between the left and right nipple is 1.5 degrees C, then the delta is 1.5 degrees. Different parts of the breast have different maximum deltas. For example, the nipple has a maximum normal delta of 0.9 C or less. Since thermography is passively recording heat being emitted from your body, a variety of factors can show up as abnormal, which may in fact be normal, or a transient condition, not a cancer. For example, infections, trauma, pimples, pregnancy, lactation and more. Once you have obtained a thermogram, it is important to take it to someone that is well informed about thermography, its benefits and limitations, and who will compare your thermogram to physical findings. We call this clinical correlation.

Changes in breast shape/contour, and areas of inflammation.

Changes in vessel patterns and deltas over time. Evidence of new vessel growth and/or an increasing deltas are significant findings.

Symmetry or lack of symmetry of blood vessel and heat patterns.

It is important to understand you do not need to have abnormal heat as identified by a thermogram to have a cancer. Nor do you need to have abnormal vessels. You can have one or the other or both if there is a cancer present. Additionally, because thermography is not 100 percent effective, it is certainly possible to have a cancer and have no abnormal thermographic findings. This is why thermography is not a standalone test. It is worth pointing out that mammography misses a significant number of cancers as well. Mammography can miss up to 30 percent of breast cancers under certain conditions; for example, women with dense breasts, and more typically up to 17 percent. (Kolb TM, Lichy J, Newhouse JH. Comparison of the performance of screening mammography, physical examination, and breast US and evaluation of factors that influence them: an analysis of 27,825 patient evaluations. Radiology. 225(1):165-75, 2002. Oestreicher N, Lehman CD, Seger DJ, Buist DS, White E. The incremental contribution of clinical breast examination to invasive cancer detection in a mammography screening program. AJR Am J Roentgenol. 184(2):428-32, 2005.) This is why, in my opinion, mammography just like thermography, should not be a standalone test and should be combined with thermography.

How accurate is a Breast Thermogram?

This has been the eternal question. Questions such as the following have been asked almost as long as thermograms have been available.

Will a thermogram detect evidence of a tumor deep in the breast, especially a large breast?

At what stage of tumor development will a thermogram detect a problem?

What is the positive predictive value? (more on this in a moment)

What is the negative predictive value? (more on this in a moment)

Is a thermogram of value in preventing breast cancer?

If the thermogram is abnormal and a mammogram is normal, what next?

These are just some of the questions that have been asked and to some extent answered. There are many studies that address these questions, yet not everyone is satisfied with the research.

My own experience supports what I have said earlier, thermography is an excellent tool, but it is not the final word in breast health assessment. No technology has the final word in detecting breast cancer. I have provided thermograms on women with normal mammograms that were highly suggestive of cancer. Once reevaluated, on multiple occasions, cancer was then detected. I have also seen normal thermograms when cancer was present. In other words,

thermography is a tool, a tool that is an excellent adjunctive assessment modality to clinical breast exams, or structural imaging such as mammography or ultra sound.

One very interesting study attempted to determine if thermography could accurately predict weather a mass identified with a mammogram was malignant or not. Since about 85 percent of mammographically identified masses that are biopsied turn out to be non-cancerous, being able to predict the likelihood of a mass being cancerous would be very helpful. The study titled, "Efficacy of Computerized Infrared Imaging Analysis to Evaluate Mammographically-Suspicious Lesions" found thermography to have an excellent negative predictive value. What this means is about 95 percent of the time, when a thermogram indicates there are no abnormalities in the area of a mammographically identified mass, the mass was in fact non-cancerous. The positive predictive value however was much lower. The positive predictive value means when a thermographic abnormality was identified, how often was it predictive of a cancer. An initial reaction to this information might suggest thermography is not a very reliable tool. It is worth noting that mammography has a low positive predictive value as well.

There are multiple considerations when evaluating the importance of a low positive predictive value.

> Thermography is most accurate by evaluating for changes over time. My experience is most women have abnormal thermograms, but most do not have a cancer. Establishing a baseline thermogram and then watching for changes will provide far better information than a single thermogram. This is one reason I recommend women obtain a baseline thermogram at age 20
>
> A thermograms effectiveness is not limited to answering the question "is there a cancer present?" Abnormal findings not related to a cancer but suggestive of an unhealthy breast can be extremely beneficial. These abnormal findings often times identify problems that may be a factor in developing a cancer. For example, evidence of estrogen dominance and inflammation are extremely useful. Women that have low grade inflammation in the breast will never know it exists without a thermogram. Yet undiscovered, this chronic low grade inflammation is a known risk factor for breast cancer. In other words, you could have a normal mammogram, normal clinical breast exam, and no breast complaints and believe you are healthy. But unknown to you, the insidious nature of chronic inflammation is dramatically increasing your risk of developing a cancer. Chronic inflammation is easily treated if you know how, but first you need to know it is there. This alone is reason enough to obtain a thermogram.

Thermography has its limitations just as any test. Used properly, and intelligently, along with appropriate clinical exams and structural imaging, thermography adds invaluable information to help you maintain a healthy life, and if a cancer is present, increase the likelihood it will be

identified at an early enough stage to make a difference.

Is Breast Thermography Safe?

Absolutely. Thermography is totally passive. What this means is there is nothing actively being done to you, such as exposing you to ionizing radiation. The thermographic camera and associated software simply and passively records the heat patterns and temperatures being emitted from your body. There is no contact, no discomfort, and no exposure to anything that is unsafe.

Who Should Obtain a Thermogram?

Clinical necessity will dictate need as some young women in their teens could be good candidates for thermography. The general guideline is a baseline thermogram at age 20, then every two years thereafter until age 30, then yearly thereafter. Thermography is most effective at evaluating for pathologic changes by comparing serial thermograms for changes. Many women have what are considered abnormal blood vessel patterns (the heat emitted by the blood in the vessel can be seen and therefore the shape of the vessel can be determined) but the vessels don't actually indicate underlying pathology. Therefore, a baseline thermogram at an early age can be most helpful. Once we know these vessels do not indicate underlying pathology, we can monitor the breast thermographically for changes. Changes in vessel patterns is a major thermographic finding.

Things to Know

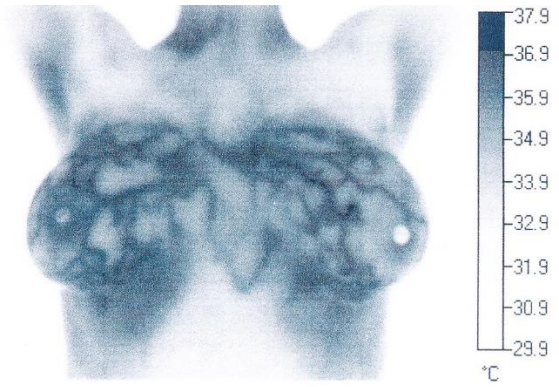
Thermal imaging is not appropriate for women that are pregnant or lactating. A minimum of three months since ending lactation is recommended prior to obtaining a thermogram. The pregnant and lactating breast becomes very vascular (see image below) which makes interpreting a thermogram very difficult.

Thermography can be used in women with a mastectomy. You might be wondering why we might use a thermogram in someone with a mastectomy. The most obvious reason in if one breast remains it should be monitored. A less obvious reason is looking for evidence of local cancer reoccurrence at the mastectomy site.

Breast implants typically do not interfere with thermography.

Dense breasts do not typically interfere with thermography.

Piercings such as nipple rings should be removed prior to a thermogram.



The image above is of a woman 7 months pregnant. The extent of blood vessels seen here is not typical except in pregnant and lactating women. It is difficult, if not impossible, to identify abnormal areas in women with this type of blood vessel patterning.

What is the Thermographic Exam Procedure?

The thermographic exam is quite simple and elegant, but accurate and reproducible results are dependent upon following a well-established protocol. The protocol involves the imaging environment and proper preparation by the person being imaged. Some thermography labs might add to the list that follows, but these should be considered a minimum.

You have no control over the lab environment, but you can be aware of an environment that is not as it should be, and obtain a thermogram elsewhere. Unfortunately, I have heard of thermography labs that do not follow appropriate pre-imaging and imaging protocols. For example, if you walk into a lab and the room is 80 degrees, you know the lab is not following protocols and your thermogram will not be accurate.

You do, of course, have control over how you prepare for a thermogram. You will need to be mindful of these as it is not uncommon for women to fail to abide by one or more of the pre-imaging protocols and have to be rescheduled.

Thermography Lab Protocol and Acclimation Period

The imaging room should be large enough that the room temperature can be maintained within a narrow range. Typically, a room should be at a steady state between 20 and 22 degrees Celsius (68-72 Fahrenheit). The room temperature should not fluctuate more than 1 degree Celsius during the exam. Fluctuating temperatures will result in changes in the vascular tone (blood vessels dilating or constricting) and this will reduce the accuracy of a thermogram.

There should not be cold or hot air blowing on you during the exam. Some labs will allow you to cool off for a few minutes in a room with a running air conditioner and in my opinion this is fine, but this is not acceptable during the exam or immediately preceding the thermographic exam. You should not be in a room where sunlight is shining on you. This will, of course, raise the surface temperature of your body, not to mention the fact the imaging room will increase in temperature.

You will need to acclimate to room temperature for about 15 minutes prior to a thermogram. This is typically done while disrobed from the waist up with your arms held away from your body so your arm pits can cool off. During the acclimation period, do not rub or scratch any area that will be imaged. This will result in increased heat which shows up on the thermogram.

There is some controversy over what angles images should be taken from. In other words, is a

front view and a side view adequate? The most conservative approach, and the one I used, was to include a frontal, lateral (side view), oblique view (where the woman is sitting at an angle to the camera), and an inferior view (image of the underside of the breast.) In my opinion, areas of concern on a thermogram may be missed if these images are not included, and temperature assessment is most accurate when the part of the breast being imaged is perpendicular to the camera lens.

Patient Pre-imaging Protocol

These are fairly standard pre-imaging protocols. You might be advised to follow others as well.

You cannot be sunburned in the area to be imaged.

Do not apply creams, lotions, powders or other skin products, and deodorant or antiperspirant over the areas to be imaged. In the case of breast thermography, this includes the breasts, chest, and arm pits, typically.

No hot shower or baths 4 hours prior to imaging.

No exercising 4 hours prior to imaging.

No massage to the area being imaged for 24 hour prior to the thermogram.

No coffee or other caffeine-containing products 4 hours prior to the thermogram. Caffeine constricts blood vessels which can prevent proper assessment of the thermogram. This is the most commonly violated protocol. In fact, in my office, we gave away coffee gift cards for women that came in in the morning and as a result were unable to have their morning coffee. Missing morning coffee was the biggest complaint with the thermogram procedure and although the complaints are made jokingly, it was hard for those that depend on a morning coffee. So my office rewarded them for their suffering with a free coffee.

Do not shave your axillae (arm pits) for 24-48 hours prior to a thermogram. This may irritate the tissue.

Do not smoke or use any nicotine-containing product 4 hours prior to obtaining a thermogram. These products constrict blood vessels.

No stimulation of the breast or nipple 12 hours before a thermogram. This will increase blood flow into the breast and may irritate the tissue, thereby rendering the thermogram invalid.

Some medications will influence the results of a thermogram. This should be discussed with the thermography lab. Do not stop medications unless directed to do so by your doctor.

Thermography and Mammography

Thermography differs from mammography as well as other forms of structural imaging. Mammography, MRI, and ultrasounds are looking for structural changes such as calcification and masses. These are, of course, valuable assessment tools. Thermography is looking more for what are physiologic changes such as increased blood vessel growth, hormone imbalance, increased temperatures, and temperature patterns which are seen as heat patterns on the breast. These two technologies are different in just about every way, other than the fact they are being used to assess the breast for evidence of disease.

It is important to point out breast thermography is not diagnostic of anything. It is simply looking for heat patterns that might indicate pathology. This information is used in combination with others exams to determine if a problem exists.

Mammography, as I have mentioned, is a controversial technology. Much can be said about mammography to support ones point of view. According to Dr. Thomas Hudson, MD, a physician, radiologist and breast imaging specialist, about 1/3 of studies evaluating the efficacy of screening mammography, show no benefit. About 2/3 of the studies show benefit. The arguments against mammography have mostly to do with screening, not diagnostic use of a mammogram, but even in diagnostic use, some argue there are concerns. This book is not about arguing for or against mammography. Mammography has its place even with its inherent problems. One day a better technology for rapid breast screening will come along and the mammography controversy can be put to rest.

The important things to take from this are the following:

Mammography is a screening that looks for structural changes in the breast.

Thermography is a technology that looks for changes in the breast by assessing changes in heat patterns.

Thermography is not diagnostic of cancer (neither is mammography). It is simply a tool, a good one in my opinion, which provides additional information on breast health. Thermography plays two roles; the first one is the reason most women utilize thermography, and that is helping to locate evidence of cancer at an early stage of development. The second use is locating evidence of unhealthy changes in the breast that may lead to the development of a cancer. For example, signs of chronic inflammation or excess estrogen influence on the breast.

Mammography is currently the standard of care for breast screening.

Because a thermogram looks for early indications of problems by evaluating heat changes within the breast (changes which sometimes occur many years prior to mammographic changes in the breast,) a thermogram may identify an early cancer many years prior to a mammogram. I have seen this in my practice, and I have also seen mammography and thermography locate problems at about the same time.

In my opinion, thermography should be used as an adjunctive assessment tool, not a replacement for other tools. Whether your routine breast assessment includes mammography, clinical breast exam (CBE), breast self-exam (BSE), MRI or some other technology, thermography should become a part of your assessment paradigm. It is noteworthy the FDA also shares the opinion that if thermography is utilized, it should be adjunctive.

How are Women Using Thermography?

The following information is not to persuade you one way or another as to how to utilize thermography. I am providing it to let you understand what other women are doing. If you are interested in breast thermography, discuss it with your physician or other health care provider. The intelligent use of thermography can be very beneficial to your health.

Mammogram and thermogram concurrently.

Alternate mammograms and thermograms on a yearly basis.

Thermogram yearly, mammogram every 4-5 years.

Thermogram yearly and a mammogram only if there are changes in the thermogram.

Some women simply refuse to have a mammogram, so they use thermography exclusively.

Women with development of breast masses will use thermography to assess the new mass. This is not necessarily a good idea since regardless of thermographic findings, a new mass should be evaluated structurally (mammogram or ultrasound, typically.) If structural imaging does not indicate a concern, confirming this with a thermogram is potentially very useful. I have had a patient with multiple new masses in her breast be evaluated and told the lumps were cysts. The thermogram was abnormal and these "cysts" turned out to be cancer once she was re-evaluated. As previously discussed, there is one study that shows a very high correlation between the thermographic assessments of a mammographically- located mass and the incidence of that mass being

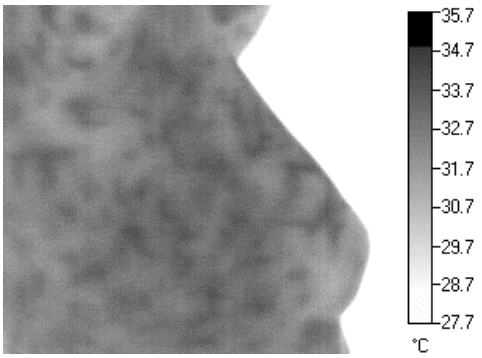
cancerous. So this practice is not without some scientific validity. But all masses in the breast should be evaluated with structural imaging.

Monitoring the site of a mastectomy. Once a breast is removed, thermography can monitor the chest wall for evidence of inflammation and increasing heat and vascularization that may indicate a recurrence of cancer.

Besides looking for evidence of cancer, thermography is used to monitor the effectiveness of lifestyle changes and treatments provided to improve breast health. For example, thermography is a good tool to look for evidence of estrogen overstimulation of the breast. This estrogen dominance is a risk factor for breast cancer. The problem is easily treated, and monitoring with a thermogram can be an excellent tool during the process. Another concern is chronic low-grade inflammation. Chronic inflammation anywhere is the body is a well-known risk factor for cancer. In the breast, chronic inflammation raises lifetime breast cancer incidence over 20-fold. Without a thermogram you would never know you had inflammation. The breast is not tender, not swollen, and a mammogram would not pick this up. Once it has been discovered by a thermogram, it can typically be easily treated. The only way to know if you are successful is with follow-up thermography. Cancer screening aside, the ability to identify low-grade inflammation is reason enough for every woman to take advantage of thermographic assessment of her breasts.

Monitoring changes in a breast that has a known cancer while undergoing treatment.

What Are the Benefits of Thermography?



This image above shows vascular fragmentation, typically related to estrogen-progesterone imbalance. Estrogen-progesterone imbalance is a potential risk factor for breast cancer. This imbalance is easily treated and should be.

The benefits of thermography have been previously discussed, but are presented here as an overview

Painless and no contact.

No ionizing radiation. Ionizing radiation is what you are exposed to during an x-ray whether it be a dental x-ray of a sophisticated piece of equipment like a CT scan or a mammogram.

Evaluates the breast for physiologic changes as indicated by heat emission from the body rather than structural changes. This provides two different assessment methods (assuming you are also utilizing mammography) which act as a cross-check.

Possibly earlier indication of pathology than can be provided through structural imaging such as mammography.

Evaluating the breast for signs of inflammation, which is known to be a cause of cancer. Thermography is the only way to do this. This is reason alone for monitoring breast health thermographically.

Identifying infections such as mastitis

Monitoring the effects of treatment for inflammation and estrogen dominance.

Monitoring the area of a mastectomy for signs of increasing heat which may indicate cancer recurrence.

Identifying evidence of estrogen-progesterone imbalance

Mammography has some difficulty identifying inflammatory breast cancer (this is very different than the low grade inflammation I have previously discussed), but thermography is very good at picking up evidence of inflammatory breast cancer. It is worth noting that thermography appears to have difficulty picking up ductal cancers in situ (DCIS). I have not seen research in this area, but maybe it exists. This information to the best of my knowledge is empirical. DCIS is an interesting cancer that is typically treated as a more aggressive cancer would be, but it appears many DCIS cancers if left alone would never become problematic. The problem is, there is currently no way to tell if a DCIS will become more aggressive so it is typically removed.

What is the Science Behind Thermography

Thermography has been attacked by opponents stating there is little or no science to support its practice. The truth is, there is considerable research to support the use of thermography. Without a doubt thermography is not 100 percent accurate, no imaging method is. But this is not a reason to argue against its use. Thermography is simply a tool, one that adds a new dimension to breast assessment.

There are actually hundreds of studies supporting thermography's use. Just as with mammography, there are also studies that do not support its use. Following, are a few of the over 800 studies that have been completed and various quotes concerning thermography. I have made no attempt to offer counter arguments against these studies and I have included one study that is negative towards the use of thermography. Be advised I have taken excerpts from these articles and some of them also include comments about thermography's limitations. My purpose in presenting the information is to point out that thermography does have science behind it. That way if you hear someone stating there is no evidence thermography is useful, you now know there statement is not based on fact, but is an opinion born of ignorance of fact.

As I have previously discussed, thermography is simply a tool, a tool with benefits and limitations. But with no downside, and potentially considerable upside due to the information provided by a thermogram, I continue to believe every woman should make thermography part of her routine breast assessment. It's like any medical evaluation, it should be used intelligently. I encourage you to dig deeper into the studies and research available on thermography and make up your own mind. After all, it's your health we are talking about.

> Efficacy of Computerized Infrared Imaging Analysis to Evaluate Mammographically-Suspicious Lesions. This study attempted to determine if thermography could aid in the determination if a mammographically-identified mass was malignant. The negative predictive value was 95 percent. What that means is, if the thermogram indicated the area of the mass was non-suspicious, 95 percent of the time the mass was nonmalignant. The conclusion of the study was "Infrared imaging offers a safe noninvasive procedure that would be valuable as an adjunct to mammography in determining whether a lesion is benign or malignant." AJR:180, January 2003
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> Relationship Between Microvessel Density and Thermographic Hot Areas in Breast Cancer. In this research the authors conclude in part "In the clinical management of breast cancer, thermography may play two potential roles. First, it may be utilized as a method of screening for breast lesions, either malignant or benign; and second, it may be able to differentiate malignant from benign lesions that have been detected by other

methods. The advantage of thermography lies in the fact that it is noninvasive and does not require irradiation. As a measure for detecting tumors of the breast, it has a false-negative rate of nearly 10%, which is similar to that of mammography or ultrasound." Surgery Today (2003) 33:243–248

Functional Infrared Imaging of the Breast. In this article the authors state "Integrating IR imaging, a safe and practical modality, into the first-line strategy, can increase the sensitivity at this crucial stage by providing an early warning of an abnormality that in some cases is not evident in the other components." Journal of IEEE Engineering in Medicine and Biology, pp 30-41, May/June 2000

Early Breast Cancer Detection using Methods other than Mammography In this article the authors take a more negative stand on thermography. They state, "In theory, thermography is ideal because it is a totally safe, passive system for measuring the temperature of the skin. To be detected, breast cancer has to generate greater heat than normal breast tissue, and this heat must reach the skin through conduction or convection. Rapidly growing breast cancers seem to be hypermetabolic and generate more heat. However, there are significant numbers of breast cancers that do not. Furthermore, the breast is an excellent insulator, and heat from small deep lesions may not reach the skin." AJR:143, September 1984

I want to emphasize thermography is not a 100 percent accurate technology. It is not a standalone test. If we use potential weaknesses inherent in thermography as a reason to avoid its use, then we should argue the same against mammography or any other technology that is not 100 percent accurate. From personal experience I have seen thermograms suggestive of underlying pathology where the mammogram was normal, only to have a cancer diagnosed in the area of thermographic abnormality at a later date. Thermography is a useful tool that provides information not available any other way. Additionally, these types of studies are only asking one question and that is how effective is thermography at locating a cancer. Keep in mind thermography has other benefits as well, benefits which have been previously discussed.

Breast Thermography after Four Years and 10,000 Studies By Harlod J. Isard, M.D., Warren Becker, MD., Arren Becker, MD., Ruth Shilo MD., Benard J. Ostrum, MD. The authors conclude "Thermography is an innocuous examination that can be utilized for preliminary screening of asymptomatic women to focus attention upon those who should be examined more intensively because of greater risk of breast cancer."

"The reported accuracy varies around the world with reported accuracy ranging from 87-96%, depending on how old the literature is. The 96% reference is from 1999, one of the more recent published studies." (USC Norris Cancer Center, Parisky, M.D., et al.)

In 1981, Michel Gautherie, Ph.D., and his colleagues reported on a 10-year study, which found that an abnormal thermogram was 10 times more significant as a future risk indicator for breast cancer than having a history of breast cancer in your family. M. Gautherie and C. M. Gros, "Breast Thermography and Cancer Risk Prediction," Cancer, vol. 45, no. 1 (January 1, 1980), pp. 51-56.

The most promising aspect of thermography is its ability to spot anomalies years before mammography. Using the same data from the 10-year study, researchers H. Spitalier and D. Giruaud determined that thermography alone was the first alarm in 60 percent of the cases of women who were eventually diagnosed with cancer. H. Spitalier et al., "Does Infrared Thermography Truly Have a Role in Present-Day Breast Cancer Management?" in M.Gautherie and E. Albert, eds., Biomedical Thermology: Proceedings of an International Symposium (New York: A. R. Liss, 1982), pp. 269-78; R. Amalric et al., "Does Infrared Thermography Truly Have a Role in Present-Day Breast Cancer Management?" Progress in Clinical and Biological Research, vol. 107 (1982), pp. 269-78”

What Information Should a Thermogram Report Contain?

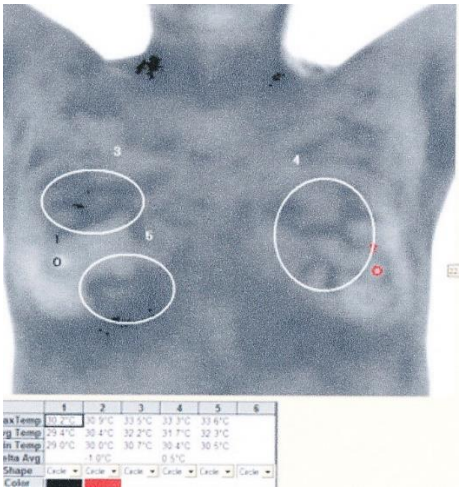
Thermography is not a standardized field and neither is the reporting format. I believe a good report should contain the following information. Different interp docs take different approaches. In my opinion some reporting formats and the included information are more useful than others.

You should receive copies of the images which should be both in color and in gray scale. Gray scale is very similar to a black and white image (see below) and allows for a better assessment of blood vessel patterns which is extremely important. I am aware of some labs that only use color images and they argue this is all that is needed. The fact is, sometimes you simply can't see a blood vessels well in a color image.

The report should compare the current thermogram to previous thermogram if one exists. One of the primary methods we use in thermographic interpretation is comparing sequential thermograms

The report should be stated. See image below. This means the images should indicate areas of abnormalities and temperatures in the areas of abnormalities. This helps the clinician, for example your doctor, to clinically correlate the areas of thermographic concern with a breast exam. Clinical correlation is the process of comparing your thermogram results with findings from a clinical breast exam.

Recommended follow up time. In other words, when is another thermogram recommended?



Nipple deltas are very important, but in some women it is difficult to identify the nipples. Years ago I began using what I called a thermodot to identify the nipples. I personally know of no other thermographers using my method of identifying difficult to visualize nipples, but hopefully the practice is becoming more widespread. I mention this because you may obtain a report that states the nipples were difficult to visualize so they were marked using thermodots. Thermodots are used in the following way. Once all the thermographic images have been taken, small round adhesive circles are placed over the nipple that needs to be visualized. Once this is done, another image is taken. When evaluating a thermogram, the image with a thermodot will identify the nipple and this area can then be identified in one of the images where the thermodot was not utilized. You cannot stat an image with a thermogram because the thermodot covers the nipple blocking the heat being emitted.

Cold Challenge, Thermal Rating Systems, Vascular Grades

You may hear the terms “cold challenge” and “thermal rating system” during your thermogram or read them in your report, so you should have some knowledge about what these terms mean and their significance or lack thereof. For a variety of reasons, use of the cold challenge and thermal rating system are not reliable. Both have been around a long time and you are likely to run into them, but I believe with time their use will diminish and eventually disappear. If they are included in your thermographic assessment and report, it’s good for you to know what they mean and the limitations.

Cold Challenge

The cold challenge was an eloquent idea, but one fraught with problems that made it unreliable. The idea was quite simple. It was believed that new blood vessels that grew as a result of a growing cancer did not behave the same way a blood vessel not associated with a cancer would. Specifically, the belief was these blood vessels did not constrict in response to stimulation of the nervous system from cold as a normal vessel would. If that was true, then it was felt an area of the breast with an abnormal blood vessel pattern could be ruled out or at least the amount of concern over the possibility of an underlying cancer could be reduced if the vessel responded appropriately to the cold challenge. The procedure involved completing a set of thermographic images, then placing the woman’s hands in ice water (some tried blowing cold air on the breasts rather than using ice water) for one minute, then retaking the thermographic images. When the thermographic images were evaluated, the temperature of a vessel would be measured both prior to the cold challenge and after the cold challenge. If an area that was thermographically abnormal also presented with a blood vessel that did not constrict in response to the cold challenge, the area was considered to be more suspicious than if it did constrict. As I mentioned, this was in theory a simple and potentially very useful test. There was only one problem; the results were not predictable, they were not always reproducible, and we really don’t know if all vessels associated with a cancer don’t respond normally, and if they do behave abnormally, at what point does this occur during their development. Bottom line is the test results were unreliable and the hypothesis was flawed from the beginning.

If your thermogram includes a cold challenge, no harm done (other than the fact that placing your hands in ice water for one minute is not very fun), but don’t rely on the results. If your thermogram has an area of concern, it should be evaluated regardless of the outcome of the cold challenge.

Thermal Rating System

The thermal rating system was another potentially good idea that really did not live up to the

desired intention, at least in my opinion. The basic idea was once a thermogram was evaluated, the number of abnormal findings in a breast were added up and depending on that number, a rating was provided. TH-5 would be a highly suspicious breast, and TH-1 would be normal. The problem was, this rating was not necessarily reflective of actual risk or likelihood of a cancer being present or developing.

The specifics of this rating system and why the system is problematic are not important, just know that the system in my opinion (and many others) is unreliable and if it is included in your report, consider it an interesting, but relatively unreliable rating system.

For your information the rating system is as follows. Abnormal findings refer to abnormal vessels or abnormal temperatures in one breast. Each breast receives a rating.

TH-1 = Non Vascular

TH-2 = Symmetrically Vascular

TH-3 = Equivocal indicates 1 Abnormal finding present

TH-4 = Abnormal indicates 2 Abnormal findings present

TH-5 = Suspicious indicates 3 or more Abnormal Findings Present

Vascular Grades

Some reports will make reference to vascular grades. Vascular grades are an attempt to rate the extent and distribution of visible blood vessels in breast. It is felt the higher the vascular grade, the more estrogen influence there is on the breast. Since excess estrogen, also known as estrogen dominance, is a risk factor for cancer, the higher the vascular grade, the less desirable. To the best of my knowledge, the vascular grade concept is more empirical than it is based on sound research. This is not to suggest empirical data is not valid, it certainly is. I think the information is worth noting, but until such a time this grading system is backed by data to support it, I would not put too much weight on the information.

There are 4 vascular grades, Grade 1, Grade 2, Grade 3, and Grade 4. There is actually a 5th grade where there is no visible vascular presence.

Grade 1: Blood vessels only involving the upper chest, not the breasts. Indicates low estrogen influence on the breasts.

Grade 2: Vessels involving the upper breast and chest wall. May or may not be suggestive

of estrogen – progesterone imbalance.

Grade 3: Blood vessels involving the upper chest and breast breasts extending to the nipple line. Again, may or may not be suggestive of estrogen – progesterone imbalance

Grade 4: Blood vessels involving the upper chest, breast and extending below the nipple line. This is felt to be suggestive of excess estrogen stimulation of the breasts.

My personal opinion is the best use of the vascular grades is to consider this data as only one piece of information during an evaluation. Other considerations might include serum, saliva or urinary tests of hormone levels, presenting symptoms, and physical exam. I would not base a treatment decision on vascular grades alone.

Breast Thermogram Examples

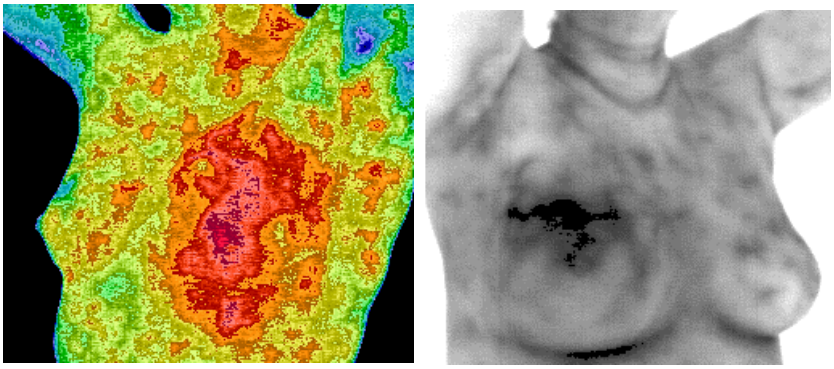
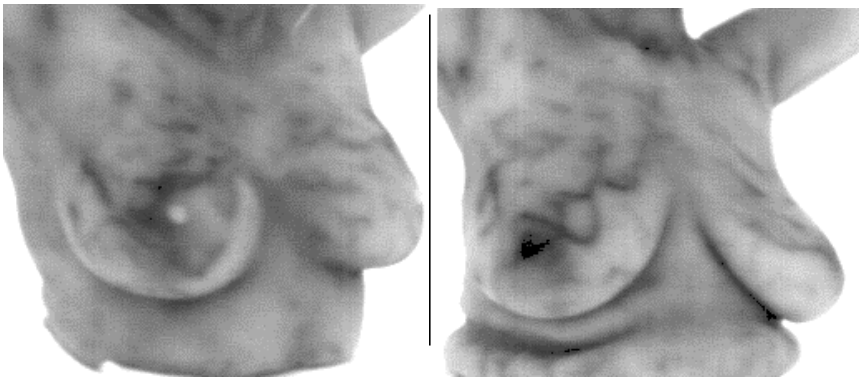


Image on the left is inflammatory breast cancer. Image on the right is breast cancer



Both images above were diagnosed with breast cancer

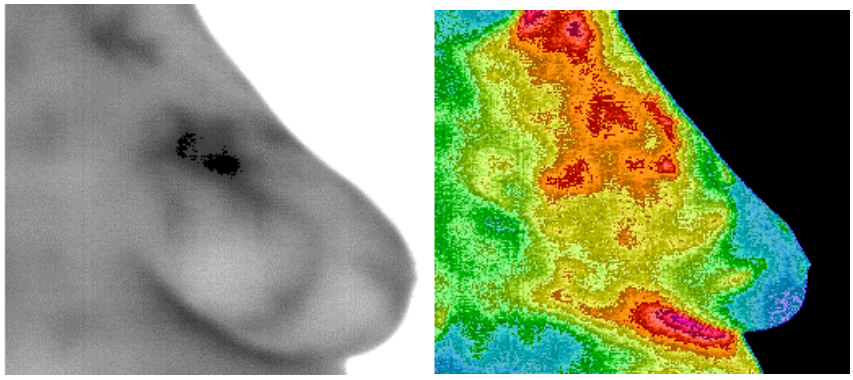
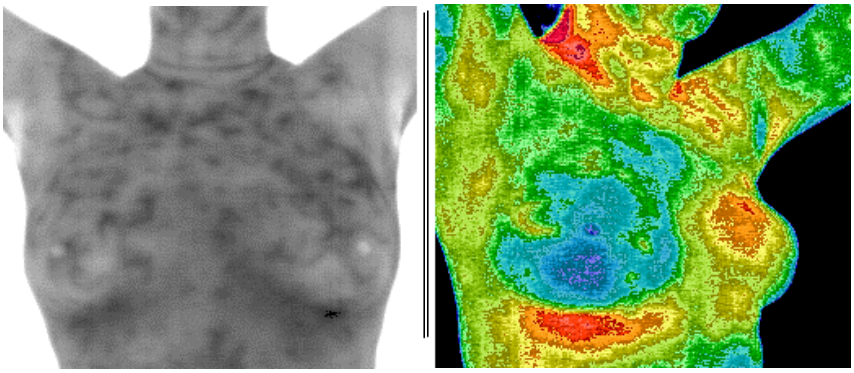


Image on the left is an abnormal blood vessel pattern but there is no identifiable cancer. Image on the right is an inflammatory process.



The image on the right is Inflammation post Mastectomy. Radiation therapy will also cause this type of heat pattern. The image on the left is vascular fragmentation. Fragmentation is often times associated with hormone imbalance.

Time for a Paradigm Shift

I have been talking about breast thermography, which as you by now know, in my opinion, is a very important tool in breast assessment. I would like to diverge from this topic for a few minutes and talk about the need for a paradigm shift in how we look at breast disease. It is my belief that in doing so, we can reduce the incidence of breast cancer.

The incidence of breast cancer appears to have stabilized and depending on the stats you choose to believe, between 1 in 8 to 1 in 11 women will develop breast cancer. In spite of the billions of dollars spent on research, breast cancer prevention and treatment has not been very successful. If a cancer is caught when it is small, the cure rate is excellent if the cancer has not spread. If the cancer has spread, especially outside of the regional area, the survival rate is poor.

It is obvious the failures have been great. There has been a considerable amount of knowledge gained in our basic understanding of cancer in general and breast cancer specifically. The problem lies in the fact this increase in knowledge has not resulted in better clinical outcomes in women with advanced breast cancer.

So what's the answer? Of course, further basic research must be continued. The answer is out there, we only need to find it. Someday our children or grandchildren will be able to walk through a hospital and not see a chemotherapy room. Cancer treatment will be as simple as treating certain conditions today that were once considered death sentences; for example, leprosy.

What we need now is a new paradigm, a different way of thinking about breast health and breast cancer prevention. Just what is a paradigm shift? A paradigm is basically a mindset, a way of looking at the world, or in this case, breast health. Our mind set is supported by, or better yet, made up of our belief systems, so in order for us to experience a paradigm shift, our beliefs need to change. What I have tried to do is shift the prevailing beliefs about "benign" breast disease and complaints such as significant premenstrual breast tenderness, fibrocystic changes, and other changes in the breast that are typically downplayed by many health care providers because these conditions are seen as benign.

The first thing we need to understand is rather than seeing breast health (and by extension, the entire body) as being in one of three states of health; no disease, benign disease, and malignant (cancer) disease, we should look at breast health as being on a continuum. At one end of the continuum is a healthy breast free of pain, significant hormonally-mediated tenderness, fibrocystic changes, fibroadenomas and other non-cancerous changes. At the other end of the

continuum, is cancer. Between these two end points is a progression of "benign" disease. We need to redefine our definition of benign to better appreciate the new paradigm. Rather than say fibrocystic changes (FCC) are benign and do not increase your risk of breast cancer (something that is not entirely correct) and therefore we don't need to concern ourselves with the problem, we need to understand what FCC actually represent. And this is true not only of FFC, but also fibroadenomas (most common benign tumor of the female breast,) and the many other benign changes in the breast. We need to understand these changes indicate a breast and a system (system refers to our body as an integrated whole) which is unhealthy. This unhealthy state is what increases the odds of developing a malignancy, not necessarily the specific changes which are occurring. Put another way, the changes which are identified in the breast as benign, may in fact not increase cancer risk directly, but the environment within the body and within the breast that allows these changes to develop, can increase cancer incidence. Therefore, it is during this phase we should intervene, rather than simply label something as benign and wait until a cancer develops. It is true most women with benign changes do not develop breast cancer, but the majority of women I have treated give a history of increasing benign changes prior to being diagnosed with cancer. It is also true women can develop cancer with no prior identifiable breast complaints. But since these benign changes do indicate an unhealthy environment within the body and breast, and are typically uncomfortable to live with, why not treat them? Treatment is easy and generally effective.

For example, one lady I treated, a women in her 40's, has had over 10 breast biopsies because she continues to develop new breast masses. Her breasts are unhealthy and she has progressive disease taking place. With treatment, she experienced a substantial decrease in her existing breast masses, with some resolving and others shrinking, and over the last few years has not developed any new masses. Another patient experienced intense breast pain premenstrually, so much in fact, it was very painful for her to lift her arms to get dressed. Thermographically, she showed evidence of estrogen dominance (an imbalance between estrogen and progesterone, in favor of estrogen), a known risk factor for breast cancer. With simple treatment her pain resolved completely within a couple months and within six months her thermogram returned to normal. So why suffer if treatment is safe and typically effective and can likely reduce the incidence of breast cancer?

Benign breast changes are often times the result of hormone imbalance. There are many potential causes for hormone imbalance and these include, but are not limited to, the following:

Poor estrogen clearance from the body. For example this can be seen with constipation and liver problems

Hypothyroidism

Adrenal fatigue

Ovarian problems

Nutritional deficiencies

Environmental estrogens. These may include estrogens in food or xenoestrogens, which are compounds similar to estrogen known as estrogen analogs that are similar in structure and function to estrogen, and result in unhealthy estrogen influence in the breast.

Breast cancer prevention begins with improving breast health. Improving breast health is in part dependent upon having a better definition of breast disease. A paradigm shift in how we look at breast health and disease is needed.

I encourage you to look at breast health differently, utilize breast thermography in an intelligent way, and take the necessary steps to return your body to health and then remain healthy throughout your life.

I once heard a physician make a simple but profound statement when it came to treating a brain tumor he had been diagnosed with. He said he knew "conventional treatment equaled conventional outcome", and he did not want a conventional outcome. His talk was on the use of exercise, meditation, supplements and herbs in the integrative approach to treating cancer.

I can tell you from experience treating women with a variety of breast complaints and abnormal thermographic findings, appropriate treatment will make a difference.

Commonly Asked Questions

Over the years a variety of questions have come up again and again. Throughout this book I have addressed these but in this section you will find some of the more frequently asked questions.

Is thermography safe?

Thermography is 100 percent safe. There is no ionizing radiation and no contact is made with the body so there is no discomfort. Thermography is totally passive and involves the recording of heat that is emitted from your body.

Does thermography replace mammography?

The short version of this answer is no. Thermography and mammography or for that matter any other form of structural imaging is an apples and oranges comparison. Structural imaging and thermography are complimentary to each other; one is not a replacement for the other.

What else can thermography be used for?

Thermography is most commonly used for breast imaging. Other common uses include neurovascular assessment and evaluation of pain. Thermography has been and continues to be used in other areas, but these are the most common.

Can thermography diagnose cancer?

No. The only way to diagnose cancer is with a biopsy. There are multiple causes of heat patterns in the breast, some of these are totally benign and others are of significant concern, including cancer. A thermogram should be followed up with a clinical breast exam and other imaging as deemed necessary in order to determine the significance of a thermographic finding.

I have heard thermograms can detect evidence of cancer years before mammography. Is this true?

Yes. There is frequently cited evidence that thermography may be able to detect evidence of cancer up to 10 years before a mammogram. But this is not a consistently reliable piece of information. Thermography may locate a problem years before mammography, or at the same time as a mammogram or may miss a cancer altogether. Thermography does not require a mass to show an abnormality. For the most part, typically aside from calcifications, a

mammogram needs a mass large enough to be seen. As I have said throughout this book, there is no perfect form of imaging. Thermography is a tool, a valuable tool that can provide information about the health of your breasts unavailable through the use of other forms of imaging. Thermography is simply one tool in your toll box.

How often should I obtain a thermogram?

Initial thermogram at age 20, earlier if indicated, and once every two years until age 30, yearly thereafter. Your unique situation may dictate a different schedule. Some thermographers recommend yearly thermograms starting at age 20. It's not that we necessarily expect to find evidence of a cancer at an early age, but changes in the breast that can increase cancer risk such as hormone imbalance and inflammation should be identified early and treated.

I had a thermogram and was told I needed a follow up in three months. Why?

The extent of vascular abnormality and or abnormal temperatures dictates when a thermogram is repeated. The goal of course is to identify any active pathology. Although not definitive, a 3-6 month follow up thermogram that remains unchanged decrease the likelihood there is an aggressive cancer in the breast.

How long before I know if an abnormal finding is a concern.

There are reports that in some slow growing cancers it can take up to 10 years for a thermogram to change suggesting an increased likelihood of cancer. If you have not experienced any changes in your thermogram for 10 years or more, it is generally felt the abnormal findings do not indicate a cancer or precancerous condition. These abnormalities still might indicate an unhealthy condition within the breast that increases cancer risk, so continued monitoring is recommended. The longest period of time I have seen before an abnormal finding changed and a cancer was diagnosed was 4 ½ years.

I have an abnormal thermogram. What do I do next?

There are several choices. The decision should be made together with your health care provider. If there is a significant abnormality then immediate structural imaging such as an Ultra sound or mammogram is indicated. If structural imaging is normal, then a follow up thermogram within 3 months is warranted. A less significant finding might warrant structural imaging as well. Sometimes an appropriate approach is to wait three months and repeat the thermogram. If an abnormality is present and no cancer can be identified, then taking steps to improve breast health is warranted. If you made the effort to obtain a thermogram and you now know there is an abnormality such as inflammation or hormone imbalance, it would make the most sense to address these issues. After all, the goal is to address problems before they

result in a cancer. Make your decision together with a knowledgeable health care provider. It's their job to guide you in the decision making process.

Should I obtain a thermogram when I am pregnant?

Pregnancy and lactation results in the breast becoming very vascular and warm which makes interpreting the thermogram very difficult if not impossible. See the image provided earlier in this book. Some exceptions are made to this rule. You should discuss this with your thermography knowledgeable health care provider.

I have had several thermograms and there is a vessel that is there sometimes and at other times is not present. What does this mean?

This finding is fairly common and is typically related to simple dilation and constriction of the blood vessel. I have seen very large vessels disappear and reappear from thermogram to thermogram. Don't make the assumption that this is what is occurring and ignore it. Make certain there is not a problem and then monitor the area.

My report mentions a temperature delta. What is that?

The delta-t, also known as a temperature delta, is the difference in temperatures between two areas. For example, the normal temperature difference between right and left nipples is 0.9C. So if the left nipple was 35.6 C and the right was 34.2 C, the delta would be 1.4C which would be considered abnormal.

The delta-t is how temperatures are determined to be normal or abnormal. There are exceptions to this, for example when a woman has a mastectomy the difference in temperatures between breasts is no longer valid. In this case a different approach to reading a thermogram is utilized.

Is it possible to have normal temperatures and still have a cancer?

Yes! Both vessel patterns and temperatures are important in the interpretation of a thermogram. You might have an abnormal vessel and normal heat, or abnormal heat and no vessels and still have a cancer present. Another finding worth mentioning is when an abnormal temperature becomes normal prior to the diagnosis of a cancer. I have seen this twice. In both cases there were abnormal vessel and temperatures on serial thermograms. Then on a follow up thermogram it was noted that temperatures had decreased, and in one of these two cases, the temperatures returned to normal, then within a few months cancer was diagnosed. As far as I know the reason this occurs is unknown. It is uncommon, but obviously occurs. This is a good time to emphasize the importance of having a good thermographer, a good interp doc

and a health care provider familiar with thermography.

As a cancer grows it requires increased blood flow to support its growth. This increase in blood vessels changes not only (potentially anyway) the vascular signature on a thermogram (which is a suspicious finding and makes us suspect a cancer), but the temperature of the tumor increases as well. When a cancer is small the temperature delta may be normal, but as it grows the temperature increases and may eventually show as abnormal.

I found a lump in my breast but the thermogram does not show any abnormality. Should I be concerned and have a mammogram or ultrasound?

Yes. If the mass is suspect at all, regardless of the thermographic finding, obtain some form of structural imaging. As I mentioned previously, one study used thermography to help identify whether mammographically identified masses were malignant or not. Thermography proved to be very beneficial. But thermography is not 100 percent accurate. If you locate an area that is abnormal, in this case a lump, then check it out thoroughly. If the mass is deemed to be benign, follow up with thermography in 3-6 months as recommended in your report or by your physician. If during the follow up thermogram there are changes in the area of concern, then have it reevaluated. I have seen this happen multiple times where the follow up showed changes in an area that was previously diagnosed as being benign, and when evaluated further turned out to be a cancer.

In Closing

I have been involved in medical thermography for over 12 years and have provided thousands of thermograms. I have seen firsthand both the incredible benefits and the limitations of thermography. With a deep understanding of the limitations of thermography, I believe all women should obtain a yearly thermogram beginning at age 20, and I have recommended this to the women I care about in my life as well as to anyone that will listen. The intelligent use of thermography may be one of the best things you do for yourself this year.

Please take the time to educate yourself about the benefits and limitations of breast thermography and then incorporate the technology into your routine breast care. Remember, thermography is simply a tool, it is not the final word on breast assessment. In concert with a Clinical Breast Exam and structural imaging, thermography can add an important new dimension to your breast assessment.

I wish for you the very best of health, happiness and prosperity!

About The Author

Michael Wedge began his career in the health care field as a paramedic in San Diego, and after 11 years moved into the field of natural medicine, Asian medicine specifically, and earned his degree in Acupuncture & Oriental Medicine (AOM) through the Oregon College of Oriental Medicine.

During his career in AOM, he developed an interest in the prevention and treatment of breast disease and, as an extension of that interest, became involved with clinical thermography. This led to Certification in Breast and Neuromuscular Thermography through the Academy of Medical Infrared Training (AMIT). He has substantial experience treating breast related complaints and offering complementary approaches to work with standard breast cancer treatment.