SUMMARY OF FINDINGS OF DIGITAL INFRARED THERMAL IMAGING
CLINICAL TRIALS WITH INBALANCE TECHNOLOGY TREATED MATERIALS

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Introduction

In January 2012 InBalance Technologies/Active Edge introduced themselves to me and discussed conducting clinical trials for their technology at Gainesville Thermography, Inc. They shared their very positive experience with “energy treated” T-shirts and other materials using Active Edge Technology’s very low frequency electromagnetic fields. They found that when a T-shirt or wristband that had been “treated” was worn by a person, they often showed increased performance in balance, strength, flexibility, endurance, focus, reduction in arthritic pain and/or improved quality of sleep. Active Edge felt the treated materials were definitely interacting with the human body, causing enhanced performance or physiological effect. The purpose of the study was as follows:

1. To determine whether digital infrared thermal imaging (DITI), otherwise known as thermography, could provide objective data to corroborate their observations and test results.

2. To determine if the Active Edge Technology works differently when applied to different parts of the body.

3. To determine if applying the Active Edge Technology to localized areas changes the results in those localized areas.

4. To determine if there is a way of measuring that the Active Edge technology is present in a material in order to assist with quality control.

Prior to this study, I did not have an opinion whether a physiological effect utilizing medical thermography would be apparent and if these questions could be answered.
Active Edge Technology Treated Material Study - Initial Screening Study Design

The purpose of this initial study was to determine whether a significant change in either temperature differentials or thermal patterns would occur on thermographic scans of persons wearing an Active Edge treated product before proceeding with additional studies. The study used 4 participants. The participants were volunteers and patients from Dr. Erickson’s medical practice. Ages ranged from the 20s to 82 years old. Some of the participants were in good general health and some had medical issues with fibromyalgia, thyroid disease or arthritis. A medical protocol was used where a health history was taken and reviewed by Dr. Erickson. No participant was on any medication that would affect the thermal imaging.

Also, the use of body lotions, makeup, antiperspirants, etc. was prohibited, as was eating or drinking for 2 hours prior to or during the study. A Meditherm 2000 DITI camera and software were used. Camera settings were not changed between each anatomical section and the room ambient temperature was controlled to 1 degree Fahrenheit. Room temperatures were also recorded between each DITI scan. Following the standard medical protocol, an acclimation period before scanning until thermal stability was achieved was also used with each participant when coming into the examination room from outside. This was in the 20 30 minute range.

A doubleblind format was used where two different headband sets were worn. These were numbered “headband #1” and “headband #2.” One of the headbands was “untreated” and the other “treated”. The study participants, the clinical thermographer taking the images, Dr. Erickson who supervised the study, and the interpreting physician at EMI did not know which headband was the “treated” one.

Three complete sets of images were taken of the upper body. Each participant had baseline (without headband) digital thermal images taken first (by anatomic region). The images were divided into the following regions: head and neck; chest; back; abdomen; upper extremities.

After this baseline, headband #1 images and headband #2 images were taken and later compared to this “without headband” baseline. Each headband was worn for 3 minutes prior to taking images and then a 3 minute interval between wearing headbands was also used. The scans were then electronically submitted to EMI (Electronic Medical Interpretation) for an independent interpretation of findings by a qualified, trained physician.

The following general observations were found on this initial study:
1. There were both increases and decreases in temperature differentials, and changes also in thermal patterns in the participants wearing both headband #1 and headband #2, compared to the nonheadband images. Many of the changes were statistically significant involving headband #2 and were most pronounced wearing this headband. It was later revealed headband #2 was the Active Edge treated headband.

2. One participant with athletic injury related pain in the upper extremities and another participant with advance arthritis/inflammation in the hands had a decrease in thermal intensity and temperature differential in the affected areas wearing headband #2, A third participant had fibromyalgia and had “pronounced” increase in thermal activity of the shoulders and upper back wearing headband #2, as well as increased thermal activity in the upper chest and shoulders.

3. A 4th participant who was a young, relatively healthy baseball player did not show a statistically significant change in images of the head, back or upper extremities when compared to the nonheadband images. A statistically significant decrease was noted on the abdominal views with respect to the distal colon.

Modification of Study Design with Additional Studies Wearing Treated T shirts, Wrist Bands & Socks

After this initial screening, the study moved forward with several modifications. The doubleblind format was no longer needed and a DITI scan before an Active Edge treated product was worn was used as a baseline for comparison. The anatomic regions studied were limited to upper extremities and in some cases, feet, rather than the entire upper body. This was because DITI scanning cannot be done through clothing e. g. shirts. Also, it was considered that wearing the Active Edge products for a longer period of time might give a clearer picture thermo graphically of what physiological effects were occurring (this turned out to be the case), even though we had demonstrated thermal changes at 3 minutes. All other parts of the protocol were unchanged. An additional seven participants were used in this part of the study, some of whom were studied on more than one occasion. Participants wore Active Edge treated T-shirts, socks or wristband(s) anywhere from 20 minutes to overnight for this portion of the study.
Participant Examples

One participant was a healthy 40 year old female medical assistant who wore an Active Edge treated product for 3 hours. Thermal images of the hands and forearms were taken, showing increases in thermal differentials and intensity in the right hand of 4.4 degrees F and 7.8 degrees F in the left hand compared to her baseline scans. This was indicative of improvement in the circulation to the distal upper extremities with wearing an Active Edge treated product.

Another of the participants was a female R.N. who suffered from Raynaud’s disease and Crest Syndrome. These are autoimmune disorders that can affect circulation in the extremities and cause pain in the fingers, especially in cold weather, and even tissue damage from lack of circulation. This person had dramatic improvement in her thermal scans following wearing a treated product for 3 hours compared to her baseline thermal scans. The scan temperature readings increased anywhere from 2.9 degrees F to 4.4 degrees F, depending on hand location. This indicated an increase in blood flow. The pain in her hands and fingers virtually resolved within 30 minutes and her bluish fingertips became much pinker, clinically indicating an improved circulation to the hands. At a different visit using Active Edge treated wristbands, clinical improvement in circulation was again noted at the 30 minute point.

Another participant was an 82 year old woman with arthritis in the hands and fingers. She also had clinical improvement in her pain after wearing a treated product for 1 hour. Her thermal scan showed a 2.9 degree F decrease in temperature from the pretreatment scan. It was felt this could be related to a decrease in inflammatory response (chronic activation of the sympathetic nervous system modulates inflammatory response) after wearing the Active Edge product.

One female participant with arthritis of the fingers and hands wore Active Edge treated socks for 20 minutes and had significant clinical reduction of pain in her hands from her arthritis. Her thermal scans showed a decreased thermal pattern in the hands, especially on the right side (worst side of her arthritis), which suggested a decrease in myofascial inflammation.

A male patient, 27 years old in good health, wore treated socks for 20 minutes. He had decreases in areas of inflammation in the shoulders that were statistically significant 20 minutes after removal of the socks. Perfusion (circulation) in the hands/fingers was significantly improved on thermography both while wearing the socks and also at the 20 minute point following removal of the socks.

These are examples of some of the participants whose images were submitted to EMI for formal medical interpretation. Additional participants were studied or restudied without submitting scans for formal interpretation, but with Dr. Erickson reviewing each scan.
Summary of Findings and Conclusions

This study of the thermographic findings following wearing Active Edge Technology treated materials is a preliminary study with a relatively small number of participants. Having said that, certain trends became apparent and suggest the following:

1. Thermography objectively demonstrates that there are changes in human physiology while wearing Active Edge Technology treated items, confirming these treated materials either directly or indirectly have an effect on the sympathetic nervous system.

2. It appears that hand/arm circulation and blood flow is improved in some participants, including some persons with certain disorders such as Raynaud’s, while wearing Active Edge treated products.

3. A decrease in thermal pattern was observed in participants with inflammatory conditions such as arthritis, myofascial dysfunction, or neuropathy. This may indicate that wearing Active Edge treated material is modifying or decreasing the inflammatory response in these persons either directly or indirectly through interaction with the sympathetic nervous system. This correlates with these participants observing a reduction in their pain.

4. Thermal pattern and temperature differential changes may be more apparent on thermographic scanning after wearing an Active Edge treated product for more than a few minutes. I would speculate that although changes are often noted within a few minutes, it could take a longer period of time (20 minutes or more) before the physiological changes are more prominent on thermography. In one treated sock participant, the benefit of wearing the socks was reflected in the thermal scans taken during the wearing period and even at the 20 minute point after removal of the socks.

5. There is a peripheral affect rather than just a local affect when wearing Active Edge treated items. We did not yet study whether the effect was more apparent at the local region and further study is planned in this regard. Also, this might be technologically difficult as we are unable to scan skin surface through a material such as a Tshirt, but this can be studied using wristbands.
6. Of importance, there were no findings on the thermographic images that indicated a worsening of physiologic functioning in any of the participants wearing Active Edge treated materials. The images were very consistent in many of the participants of an enhanced physiological response wearing Active Edge treated materials.

Patient before wearing Active Edge:

![Thermographic Image of Patient Before Wearing Active Edge](image1.png)

Patient after wearing Active Edge for 20 minutes:

![Thermographic Image of Patient After Wearing Active Edge for 20 Minutes](image2.png)