Protocol Title: Thermalogical Analysis of a cohort of women undergoing mammographic analysis.

Protocol Number: SBS-001

Version Number: 1

Version Date: 6/28/2017

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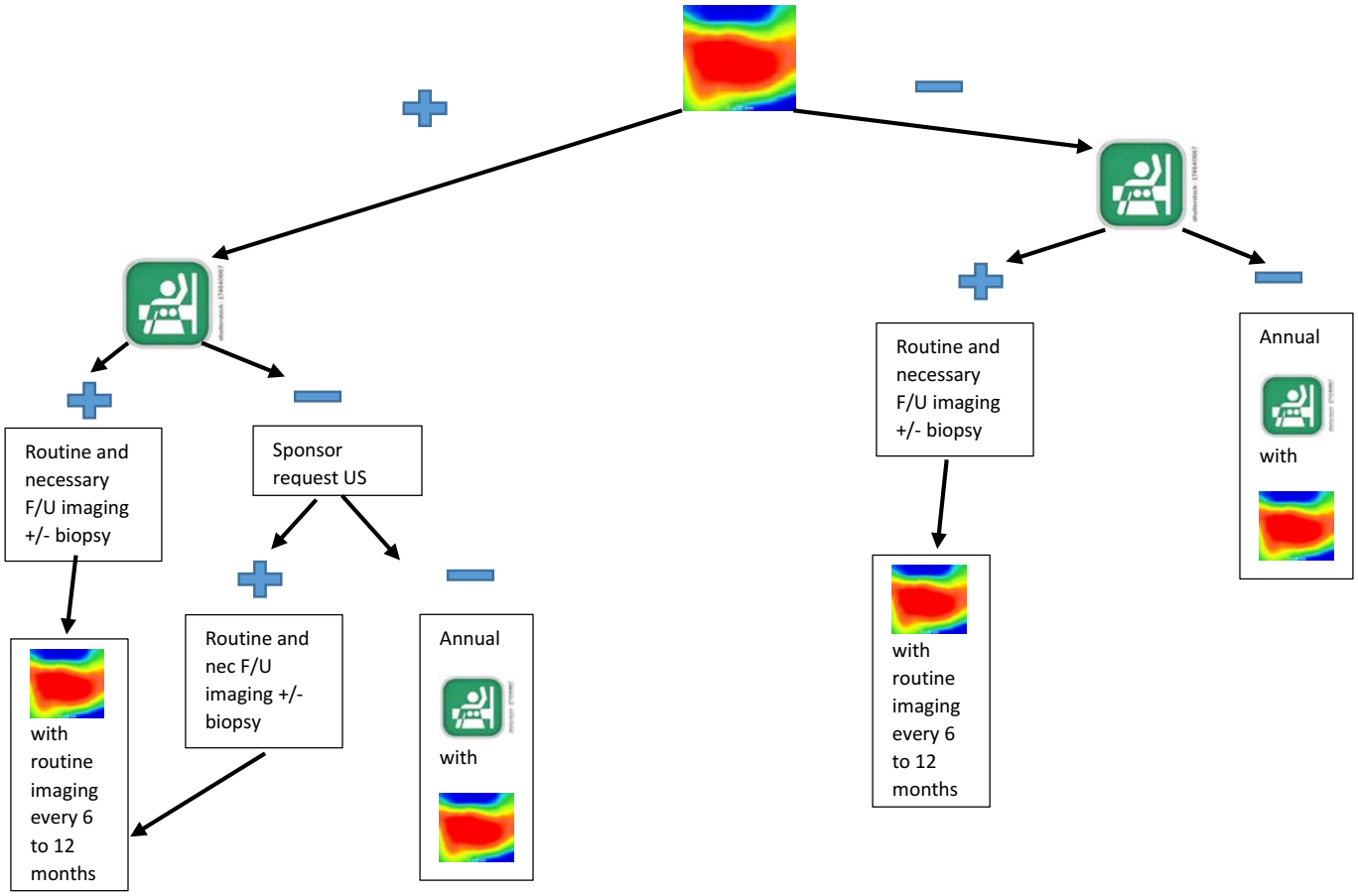
1. I agree to follow this protocol version as approved by Schulman and Associates IRB.
2. I will conduct the study in accordance with applicable IRB requirements, Federal regulations, and state and local laws to maintain the protection of the rights and welfare of study participants.
3. I certify that I, and the study staff, have received the requisite training to conduct this research protocol.
4. I have read and understand the information in the Investigators' Instructions for Use regarding the risks and potential benefits. I agree to conduct the protocol in accordance with Good Clinical Practices (ICH-GCP), the applicable ethical principles, the Statement of Investigator (Form FDA 1572), and with local regulatory requirements.
5. I agree to maintain adequate and accurate records in accordance with IRB policies, Federal, state and local laws and regulations.

University of Toledo Principal Investigator

_____
Printed Name

_____ _____
Signature Date

Study Schema



SBS II: positive for TH 4 and 5, negative for TH 0, 1, 2, 3, or 6

mammogram: negative for BIRADS 1 and 2, positive for BIRADS 0, 3, 4, 5, or 6

List of Abbreviations

CBE	Clinical Breast Exam
FSM	First Sense Medical®, LLC
SBSII	Sentinel Breast Scanner
TS	Therma-Scan Reference Laboratory, LLC (analyzes and produces report)
FS/TS	First Sense/Therma-Scan
MMG	Mammogram
PPV	Positive Predictive Value
PI	Principal Investigator
IRB	Institutional Review Board

Introduction

First Sense Medical®, LLC is a medical device company which has developed a breast cancer screening device, the Sentinel Breast Scan II [SBSII]. This radiation free device is being developed to produce data which will be analyzed by Therma-Scan Reference Laboratory. Dr. Hoekstra, CEO of Therma-Scan, is the author of a published paper based on breast thermal data with a reported 95% sensitivity and 91% specificity[1]. The SBSII examination will take approximately 7 minutes.

This study is designed to evaluate the Sentinel Breast Scan II® as well as the analysis of data by Therma-Scan. SBSII® thermal breast data is an adjunctive aid to standard breast imaging. Currently, mammography is one of the standards of care in screening for visible signs of breast cancer. Breast thermology is the analysis of the heat signature data from an examined breast. All study costs will be incurred by the sponsor. Study subjects will incur no cost to participate. All scientific data revealed in this protocol will be used for the specific objectives of the study. The SBSII is a non-significant risk device. There is no contact with the subject during the entire procedure.

Background Information

1.1 Breast Cancer Screening Today

Screening is testing of asymptomatic (without symptoms) and symptomatic women. Mammograms identify abnormalities and determine their location in the breast. If a biopsy of the area in question is positive, treatment includes surgical removal of the cancer followed by radiation and medical therapy, if indicated. The standard protocol in the United States for Breast Cancer screening includes an annual clinical breast exam and mammogram for women over 40 years of age[2] . Women with a family history of Breast Cancer or other indicators may be screened at an earlier age and more frequently. If the results are positive, further diagnostic testing may be prescribed and a biopsy may be taken. If the SBSII scan reveals a thermal pattern on analysis that meets established criteria and the mammogram is read as normal, FSM intends to contact the site PI. The study participant will then be encouraged to undergo additional standard diagnostic imaging tests. These additional tests are performed to assure that the patient has no evidence of abnormality utilizing advanced breast imaging techniques in use today. However, the additional tests ordered may indicate the need for further investigation prescribed by the study doctor. These imaging tests will be paid for by First Sense Medical.

1.2 Therma-Scan System

First Sense Medical® has partnered with Therma-Scan Reference laboratory, an established pioneer in medical thermology. Therma-Scan has been in operation for over 40 years and operates a diagnostic clinical imaging facility in Birmingham, Michigan. Dr. Philip Hoekstra has developed a complex and inclusive protocol for the detection of tissue abnormalities indicative of Breast Cancer. He has examined thermology scans on more than 500,000 women using a medical grade digital infrared camera

[1]Hoekstra P, The autonomic challenge and analytic breast thermology. Thermology International, 2004(14);3:106.
[2]American Cancer Society

that utilizes advanced imaging techniques. Dr. Hoekstra follows an analytic technique derived from the Marseille system to provide results of a breast thermogram on a recognized 'TH' scale.

Breast thermology is effective on women of all ages. And the density of breast tissue is not an impediment to breast thermal analysis. Utilization of the Marseille system, an internationally standardized thermology classification system, defines 5 TH categories based on a range of breast thermal findings; these range from TH-1, considered normal, thru TH-5, considered abnormal. Additionally, there are two other categories: TH-0, a technically defective test and TH-6, a known biopsy proven cancer. Therma-Scan Reference Laboratory will screen for thermal signs indicative of change and report the findings using this proven system.

1.3 **Sentinel Breast Scan® System [SBSII]**

The SBSII will automate the recording of thermal data used in the Therma-Scan manual thermology protocol by utilizing a thermal camera sensitive to changes in breast temperature. The SBSII system uses a very sensitive thermography camera that detects and visually displays heat patterns that naturally emanate from the breast. SBSII captures this data digitally for subsequent analysis by Therma-Scan.

This study will evaluate the clinical efficacy of the SBSII device in patients completing a screening or diagnostic mammogram. The thermal images captured on examination will be analyzed by Therm-Scan and the results will be compared to mammographic analysis. If the Sentinel Breast Scan II findings indicate a reading of either TH4 or TH5, FSM may request that the patient receive additional testing, ie breast ultrasound or MRI. The additional testing that are not considered routine and necessary based on standard breast imaging, will be paid for by the sponsor, as outlined in the study budget.

1.3.1 Projected Advantages of Sentinel Breast Scan® Test/Therma-Scan System:

1. **Higher sensitivity and positive predictive value (PPV)**, Sensitivity measures the percentage of positive results when cancer is present. PPV is the true positive rate, and is the percentage of abnormalities with a positive result. The false positive rate is the percentage of normals identified as abnormal. Higher positive sensitivity in a screened population is the goal of all screening methods. This parameter will be utilized in the analysis of data from this study.

2. On average, mammographic **sensitivity** varies between 60-90%. It is lower in women under age 40 and in those with dense breast tissue.

3. **Year-to-year comparisons.** An important factor in analysis is identification of subtle visual change that is detected by comparing a previous mammogram to a current one. SBSII® seeks to identify subtle changes over time in breast thermal signals through the use of sophisticated software.

4. Patient Saftey: Practice guidelines in the United States delay screening younger women with mammography based on the accretion rate of radiation exposure. Thermographic analysis of the breast is radiation free and innocuous as a screening modality for younger women and is not affected by breast density.

5. **Greater Access.** Because breast thermography can be performed in a non shielded environment, the opportunity to use this technology in a more welcoming environment is apparent.

Objectives/Purpose

The primary objectives of this feasibility study are to evaluate the functionality and performance of a novel adjunctive breast cancer screening system (FSM SBSII/Therma-Scan System) and utilize the data to provide further calibration for system software.

Specific Objective 1: To observe and document the performance of the FSM SBSII automated imaging system hardware and software in a clinical setting, and analysis of that data by TS.

Specific Objective 2: To both modify [if indicated] and measure the accuracy of an established manual thermographic analytical protocol (performed by TS), as well as define the approximate location of a particular finding and classify thermal irregularities in breast tissue.

Specific Objective 3: To develop and measure the accuracy of the system software to both approximate the geographic location of and classification of thermal change in breast tissue.

Thermal imaging captures the intensity and patterns of skin temperature using a high-performance infrared (8-14µm wavelength) camera. Pre-cancerous and cancerous breast tissue results in regional heating of the skin accompanied by complex irregularities in vascular patterns and aberrations in the adaptive modulation of skin temperatures[3]. This information can be imaged by thermal cameras and will be analyzed by TS. Although thermography cameras have been approved by the FDA for adjunctive use in breast cancer screening, this technology has not been widely accepted for several critical reasons. Lack of adequate quality control, adherence to standards for experience and training and inconsistency from practitioner-to-practitioner in the application of this technology have resulted in published studies with wide ranging sensitivity and specificity (Fitzgerald and Berentson-Shaw 2012). Because of this clinicians have been prevented from formulating a reasoned conclusion about the efficacy of breast thermography as adjunctive to standard breast imaging or its value as a method of risk assessment. Peer-reviewed clinical studies have amassed thousands of subjects and data points over time. However, a scarcity of systematic review and meta-analysis has impeded meaningful comparison to standard breast imaging technology (Vreugdenburg, Willis et al. 2013).

The core strengths of thermography are multi-faceted. Thermography is a fast, non-invasive, low cost and painless procedure performed without radiation exposure. Published studies support its use for early detection of breast tissue abnormalities and in identifying groups that may be at higher risk for developing breast cancer.

As an adjunct to mammography, thermography may be especially useful for screening younger, pre-menopausal women and women with dense breast tissue for whom mammography is less effective (Bleyer and Welch 2012).

[3] Library, T.-S. R. (2011). "Thermology: Analytic Features." A Professional's Guide To Breast Thermology Retrieved January 4, 2013, from http://www.thermascan.com/professionals.html.

An automated platform for collecting thermal imaging data that provides objective, interpretative guidelines and standardized reporting would be an important adjunctive tool to aid in risk assessment and clinical decision-making in breast cancer screening.

Study Design and Selection and Exclusion of Subjects

1.4 Study Design: Testing a minimum of 2000 women receiving mammograms (comparing the SBSII/TS test results to the mammogram and biopsy results when applicable)

a. SBSII test will be done before all mammograms, diagnostic or screening

b. Women must wait a minimum of (3) days between mammography and the SBSII.

c. If the SBSII test is positive and mammography is negative, FirstSense may request a breast ultrasound or MRI to determine the accuracy of SBSII. The acquisition order for MRI study will be done with prior approval by FSM.

d. Any study subject, regardless of biopsy diagnosis and treatment, will continue to complete the SBS II imaging in conjunction with all future routine and necessary mammograms, not to exceed less than 6 months between each SBS II imaging, for up to 5 years from the start date of the subject's study participation. For subjects that undergo mastectomy after initial study participation, and are no longer completing routine and necessary mammograms, the SBS II will be completed with future routine and necessary breast MRI imaging, not to exceed less than 6 months between each SBS II imaging, for up to 5 years from the start date of the subject's study participation.

1.4.1 Subject Inclusion Criteria:

1. Female, over the age of 18 years of age.
2. Asymptomatic women or women who are being screened for breast abnormality.
3. Women scheduled for a mammogram or women who have had a mammogram and are given 3 days to wait in between their mammogram and scheduled biopsy and FS/TS system.
4. Not pregnant or breast feeding.
5. Signed Informed consent.

1.4.2 Subject Exclusion Criteria:

1. Subject does not meet inclusion criteria, noted above.
2. Use of 100 mg or more of niacin by tablet or niacin patch within the last 24 hours.
3. Use of nitroglycerin within the last 24 hours.
4. Subject experienced a fever of 102°F or higher within thirty-six (36) hours of the study.
5. Subject must not have had a mammogram, breast ultrasound, or breast exam within the last 72 hours prior to the SBS II.

1.4.3 Subject recommendations to follow prior to and day of Testing:

1. No use of tobacco within two (2) hours of study.
2. Subject should refrain from the consumption of caffeinated coffee, tea or any other caffeinated products for two (2) hours prior to the examination. This includes energy drinks/shots.
3. Subject should have no exposure to natural or artificial light for chest tanning, three (3) days or less prior to study.
4. Subject should have no exposure to vigorous physical stimulation, examination or compression of the breasts (self or clinical examination, ultrasound or mammogram) three (3) days or less, prior to study.
5. Subject should have no exposure to sauna, steam-room or hot/cold packs twenty-four (24) hours prior to the study.
6. Subject should have no evidence of new bruising, rash or skin irritation on the subject's breasts or underarms on the day of the study.
7. Subject will refrain from using deodorants, creams, powders or lotions that contain talcum powder which may cause an inflammation in the breast area on the day of the study.
8. Subjects exposed to outside environmental extremes, such as very cold or warm temperatures, should acclimate in a comfortable room temperature for approximately fifteen-twenty (15-20) minutes prior to the equilibration process.
9. The patient should refrain from exercise, bathing, or showering for one hour prior to examination.

These recommendations should be given to the patient prior to testing and then reviewed with them at their scheduled appointment. Should a patient not follow one of the recommendations, the study staff should note it on the CRF.

Study Procedure:

The study will initially involve approximately 2000 enrolled subjects. This number can be expanded with the consent of FSM and the principle investigator. The study will be led by the Principal Investigator (PI), Dr. Haitham Elsamaloty. The testing will be performed at the University of Toledo in Toledo, OH. The study staff or PI will speak with prospective women that have been referred to the University of Toledo by their physician, are patients of the University of Toledo, or are interested in becoming participants in this study. The study staff or PI will determine whether the patient is eligible to participate in this study and provide them the necessary documents to enroll. Women who have not been referred by their physician may still be considered for the study provided they are first determined to meet study eligibility requirements. The study staff will consent eligible participants using the IRB approved Informed Consent Form[4]. Each consented participant will be asked to fill out a questionnaire to provide pertinent medical information required by the protocol. This information will be utilized to determine study eligibility. The study coordinator will assign an arbitrary identifier for each participant enrolled in the study. The acquired study data and images will only be identified by the arbitrary identifier. Only the study staff and the PI will ever have access to both the participant name and the arbitrary

identifier.

Test Procedure:

Eligible participants will be consented using the IRB approved Informed Consent Form. Ineligible subjects will not be enrolled in this study. Study candidates will be given a questionnaire to complete. Once the questionnaire is completed by the potential participant, the study staff or PI will verify that the information is correct and complete and assess the participant's study eligibility.

On the day of the study, the study staff will review the entire test procedure including safety precautions with the participant. The study staff will then begin the SBSII initialization procedure. The study staff will then assist the subject in preparation for the test. Subjects will be asked to disrobe from the waist up and sit in the chair facing the tester. Once the subject is positioned properly in front of the tester, the study staff will assure that the subject is comfortable and her arms are properly placed on the armrests.

With the subject properly positioned in front of the SBSII scanner, the study staff will inform the subject that the test will take approximately 7 minutes and that there will be no physical contact with the tester. The participant will be advised to remain still during the scanning process.

Before thermal image acquisition, the SBS II study staff operator will determine the frontal and lateral thermal image acquisition angles using the live thermal image of the subject's breasts provided on the SBSII monitor. Once the angles are determined, the study staff operator will start the test. During the first step the patient will acclimate for 30 seconds, then cool air will be blown on the breasts for approximately 3 minutes. The air is then stopped and the patient will then acclimate for approximately 3 minutes. Thermal images are acquired starting at the first step and continuously until after the final acclimation step is completed. The patient must remain motionless throughout the initial period of acclimation, during the cool air sequence, and the final acclimation sequence in order to capture thermal images in series from the start of the test to its completion.

End of the test:

The test will be completed when the SBSII scanner signals that all images are acquired. The patient is now allowed to move.

Assessment of Safety and Risk

The potential risks are identified in this study and tests have been done to mitigate the risk.

Table 2. Risk Assessment

Medical Risk	Initial Severity	Initial Frequency	Control Measures	Final Severity	Final Frequency
Blowing cold air onto participants may cause discomfort.	Low	Remote	Participants may leave the study any time during a test.	Minor	Remote

Mix a patient's results with another patient.	Low	Remote	Each participant will be assigned a unique study ID. This ID will be entered electronically through the SBS II Tester User interface. This ID will be appended to the Thermal Data file names. Patients will not receive final reports.	Minor	None

Discontinuation of the Study

At any time before or during the SBSII test, a subject is able to cancel or discontinue the clinical trial without penalty.

Data Analysis

1.5 Data analysis for Specific Objective 1:

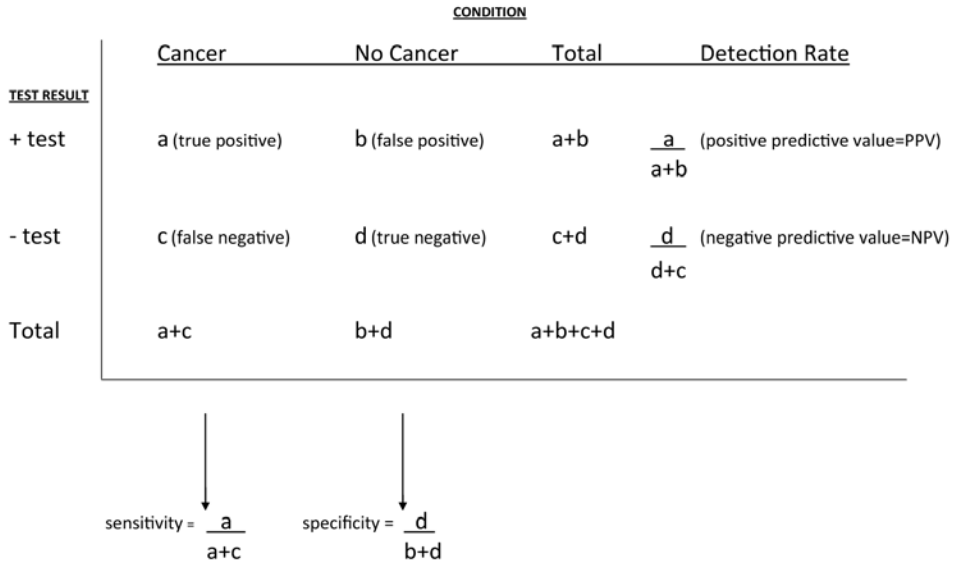
The system hardware and software will be observed and log files will be analyzed by FSM to confirm proper operation of the system.

1.6 Data analysis for Specific Objective 2:

Thermal imaging data will be assessed by TS according to the internationally standardized thermology classification 'TH' scale, also known as the Marseilles system (Amalric, Brandone et al. 1978), which defines five categories of risk assessment.

The 3D, thermal and visible light data will be analyzed by TS to search for signs and criteria that indicate potential breast tissue abnormalities and arrive at a TH1-5 classification. Pattern recognition is used to identify blood vessels and measure the temperature points within these vessels. TS employs mathematical analysis to reduce the effective temperature variance and determine the probability of breast cancer. TS also uses mathematical techniques to measure magnitude of the focal areas on the breasts relative to the surrounding area. TS analyzes the average of approximately 10,000 data points and compares this analysis to the heat in any local hot spot. Sensitivity and specificity will be calculated by TS as described and data will be used to compare results with those from mammography and biopsy reports.

Clinically, a TH4-5 classification may result in a recommendation from the sponsor for further assessment. For study purposes, a comparison of the thermal categorization findings using the Marseille system to biopsy results will be analyzed. These results will provide a baseline for the semi-automated software analysis. Sensitivity and specificity will be calculated as follows:



In addition, the data collected will be used to train, test and measure the accuracy of risk assessments utilized in manual thermography analysis when a cold air challenge is introduced into the clinical examination procedure. All data collected from study mammograms and biopsies will be divided into a phases consisting of all unblinded exams resulting in the identification of up to 10 biopsy proven cancer cases, a testing phase consisting of all double blinded exams resulting in the identification of up to 45 biopsy proven cancer cases, and a double blinded clinical trial consisting of all exams resulting in the identification of up to 45 biopsy proven cancer cases to measure the accuracy of manual thermography analysis as stated in Specific Objective 2.

1.7 Data analysis for Specific Objective 3:

The accuracy of the imaging system software to define the approximate location and identification of aberrant thermal signatures of increased metabolic activity will be compared to results found on analysis of mammographic and biopsy results.

IRB Ethics & Informed Consent:

The protocol, Informed Consent Form, and relevant supporting information must be submitted to the IRB for review and must be approved before the study is initiated. In addition, any subject recruitment materials must be approved by the IRB prior to use. This study will be conducted in accordance with the ethical principles that have their origin in the Declaration of Helsinki and that are consistent with the International Conference on Harmonization - Good Clinical Practice (ICH-GCP) guidance and applicable regulatory requirements. The study will be conducted in accordance with the regulations of the United States Food and Drug Administration (FDA) as described in 21 CFR Parts 50, 56 and relevant sections of 21 CFR Part 812, and the IRB requirements.

The sponsor must submit any change to the protocol to the IRB for review and approval before implementation. A protocol change intended to eliminate an apparent immediate hazard to subjects may be implemented immediately, provided the reviewing IRB is notified within 5 working days of implementation.

It is the responsibility of the study staff or principal investigator to provide each subject with full and adequate verbal and written information, before inclusion in the study, using the IRB approved Informed Consent Form, including the objective and procedures of the study and the possible risks involved. Informed consent must be obtained prior to performing any study-related procedures, including screening. A copy of the signed Informed Consent Form will be given to the study subject.

Study Oversight & Clinical Trial Monitoring Plan:

Proper study monitoring ensures adequate protection of the rights of human subjects, the safety of subjects involved in a clinical investigation and the quality and integrity of the data submitted as a result of the investigation. Therefore, ongoing monitoring of this clinical research investigation will be conducted with the intent to:

1. Verify that patient consent for study participation has been properly obtained and documented ensuring compliance with Good Clinical Practice (GCP) standards and FDA regulations for protection of human subjects.
2. Verify that research patients entered into the study meet inclusion and exclusion criteria.
3. Verify that the study is conducted in compliance with the protocol.
4. Verify the accuracy and privacy of the data collected.
5. Verify that all essential documentation required by GCP standards and IDE regulations are present, current and appropriately filed.

Routine monitoring will be scheduled at appropriate intervals, with more frequent visits occurring at the beginning of the study. An initiation visit will take place, followed by routine monitoring visits. Additional visits can be scheduled at the request of the PI.

For each subject enrolled, there will be 100% monitoring of informed consent documents, inclusion/exclusion criteria, serious adverse events, and unanticipated adverse device effects. In addition, the first ten (10) subjects enrolled will have 100% of the data collection forms and associated source documents reviewed to ensure that all data collection has been completed and to ensure compliance with the protocol. FSM will need to receive copies of IC's or view them on site to verify they are properly signed by participant as well as the person who performed the consenting process.

Consent Forms

Review of the consent. The patient must sign the IRB approved version of the Informed Consent Form prior to initiation of the protocol.

a. Verify that a signed and dated Informed Consent Form was obtained from every patient screened and that the study staff or principal investigator has signed all consents.
b. Verify the date that the Informed Consent Form was signed is before any study-related activities were performed.
c. Verify that the correct version of the Informed Consent Form was signed initially and that any subsequent versions of the Informed Consent Form which were approved during the time the patient participated in the study have also been signed.

Inclusion/Exclusion Criteria:

1. All inclusion/exclusion criteria must be met to determine subject's eligibility to enter the trial.
   a. Verify that the study staff or principal investigator has signed a statement confirming patient eligibility.
   b. Verify that there are no contraindications to the planned procedures.

Protocol Compliance:

1. Verify that the study is being conducted in compliance with the current IRB approved protocol.
2. Verify that the correct protocol version is in place.

AE/SAE Reporting:

1. Serious adverse events must be reported according to protocol requirements. All AE/SAE events will be monitored by and reported to Dr. Darius Francescatti, Quality Control Manager, First Sense Medical. An AE/SAE should be reported when any undesirable experience associated with the Sentinel Breast Scanner occurs, such as death, life-threatening event, hospitalization, disability or permanent damage, required intervention to prevent permanent impairment or damage to persons or device, electrical shock from the tester. Subjects should notify the study staff of any AE/SAE they believe should be reported. The study staff will then take all measures to ensure this is reported properly to the PI and First Sense Medical. Reports should be sent to the PI and Dr. Darius Francescatti, Quality Control Manager, First Sense Medical.

2. The following steps should be taken when reporting an AE/SAE:
   a. Verify that the serious adverse event was reported within the proper time period.
   b. Verify that a description of the AE/SAE, interventions, and outcome are described in the progress note and have been provided to the study staff.
   c. Verify that a copy of the AE/SAE report and IRB notification are filed in the regulatory binder.
   d. Verify that AE/SAE report(s) have been sent to the IRB/FDA, where required, and is filed in the regulatory binder.
   e. Verify that the AE/SAE report(s) have been sent to the PI and Dr. Darius Francescatti, First Sense Medical.

UADE (Unanticipated adverse device effects) Reporting:

1. Unanticipated adverse device effects (UADE) must be reported according to protocol, IRB and FDA requirements.
   a. Verify that an evaluation of the UADE was completed and that risk determination to subjects has been made.
   b. Verify that investigations presenting an unreasonable risk were terminated within 5 days of risk determination and fewer than 15 days after receiving notice of such effect.
   c. Verify that an evaluation of the UADE, interventions, and outcome are described in the report.

d. Verify that the UADE report was sent to the IRB (and FDA, where required) within the 10 working day time period and that copies of such correspondence are filed in the regulatory binder.
e. Verify that a copy of the UADE report, IRB notification, IRB and FDA response are filed in the regulatory binder.

Follow Up:

a. FSM may collect follow up information about study subjects if the study subject completes additional testing related to breast screening.

Regulatory Binder:

The regulatory binder will be checked at each visit to ensure that all required regulatory documents have been obtained prior to the start of the study and have been kept current during the study. They include:

1. Protocol and protocol amendments
2. Sample, approved Informed Consent form
3. CVs for investigators and sub-investigators, if applicable
4. Copies of current licenses and or certifications
5. Sample CRFs
6. Subject master log/Subject screening log
    i. Must show documentation of existence/participation of subjects
    ii. Must be consistent with information within the CRF and in the individual subject record.
7. Serious Adverse Event log
8. IRB approval
9. IRB composition
10. IRB correspondence
11. Signature log
12. Delegation of Authority log
13. Visitor log
    i. Monitor will sign and date the log indicating:
    ii. Date of the visit
    iii. Name of the individual conducting visit
    iv. Coordinator will confirm that visit took place by initialing.
14. Correspondence related to the study

Source Documents:

Source documents are essential documents that individually and collectively permit evaluation of the conduct of a clinical study and the quality of the data produced. Examples of source documents are hospital records, office charts, lab reports, x-rays, case report forms when date is entered directly, magnetic media, and photographic negatives.

Specific case report forms in this trial will be considered source documents because the data are collected one-on-one with the subject and entered directly onto the case report form.

The files will be named with the inclusion of a blind patient ID. The patient name will not be in the filename or in the contained data. Only the study staff will know the relationship between the patient name and ID.

Data Management

The FSM will collect the following de-identified data during the study:

- 3-dimensional data providing shape and profile information of the patient's breast region.
- Thermal (infrared) images providing temperature information of the patient's breast and subclavian regions (near neck).
- Visible light images providing visual color and skin tone information of the subject's breast region.
- Log files providing information about SBS II.
- Completed patient CRFs (see below appendix)

This de-identified data will be stored on a secured cloud platform and in the SBS II hard drive and will only be accessible by Therma-Scan Reference Laboratory, LLC and First Sense Medical, LLC.

The files will be named with the inclusion of a blind patient ID. The patient name will not be in the filename or in the contained data. Only the study staff will know the relationship between the patient name and ID.

At Therma-Scan Reference Laboratory, LLC, the files will be stored on secured computers. Only selected TS employees trained in HIPAA and PHI protection regulations will have access to this data. Those employees will not know or have access to the subject's ID.

Intended Use of the Data:

The ID-protected, 3-dimensional, thermal and visible light data that will be collected by the SBS II will be analyzed by TS. The data will be analyzed and compared to mammography, breast ancillary tests, and / or biopsy findings, or follow up breast imaging. This protocol is used to search for signs and criteria that indicate the potential of breast tissue abnormalities associated with the risk of breast cancer. We intend to use this data solely for device development purposes. The log files will be analyzed by FS to confirm proper operation of the SBS II scanner. These results are not intended for submission to the FDA for marketing approval. These results are solely intended to be utilized to further develop and refine the FS/TS system and device performance. These results will not be utilized for any clinical decisions related to the subjects included in the study.

Confidentiality:
All the participants of the study will be assigned a unique patient ID number. The de-identified, acquired data will be accessed by trained TS analysts for analysis purposes only. FSM and TS will not have access to the patient's name, address or phone number. Records will be maintained using the unique patient ID number and will be stored in a HIPPA compliant manner.

References:

1. Hoekstra P, The autonomic challenge and analytic breast thermology. Thermology International, 2004(14);3:106.

2. Ng EY, & Kee Ee, Advanced integrated technique in breast cancer thermography. Journal of Medical Engineering and Technology, 2008. 32(2), 103-115.

3. Arora Nil Ruggerio 0 , Tousimis E, Swistel AJ, Osborne MP, Simmons RM, Effectiveness of a noninvasive digital infrared thermal imaging system in the detection of breast cancer. American Journal of Surgery, 2008.196(4): p. 523-526.

4. Keyserlingk JR, Ahlgren PO, Yu E, Belliveau N, Infrared imaging of the breast: Initial reappraisal using high-resolution digital technology in 100 successive cases of stage I and II breast cancer. The Breast Journal, 1998.4(4): p. 245-251.

5. www.thermascan.com

Appendix A

Patient Recommended Preparation Instructions

Please follow these recommended preparation instructions prior to your FirstSense Breast Exam:

- You are asked to avoid any natural or artificial tanning of your chest for two-three (2-3) days prior to the study date.
- You must not have had any fever within thirty-six (36) hours of the examination.
- You must avoid ultrasound, mammogram, MRI, and clinical physical examination of the breasts for at least three (3) days prior to the examination.
- There should be no bruising, rashes, or skin irritation in the breast area on the day of the study.
- You should refrain from hot yoga, sauna, steam-room, or hot/cold packs in contact with the breasts for at least twenty-four (24) hours prior to testing.
- You are asked to refrain from exercise, bathing, or showering for one hour prior to examination.
- Please refrain from using deodorants, creams, powders or lotions containing talcum powder which may cause an inflammation in the breast area on the day of the study.
- You are asked to refrain from any tobacco use, or the consumption of caffeinated coffee, tea or any other caffeinated products for two (2) hours prior to the examination. This includes energy drinks/shots.

For your comfort, we recommend that you wear a pull over or button down shirt.

If you have any questions please contact:

Stephanie Smiddy, RN, BSN, CCRC
Clinical Research Manager
University of Toledo-Health Science Campus
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Appendix B

FIRSTSENSE MEDICAL®
TECHNOLOGY SAVING LIVES

Questionnaire

Please provide answers to the following questions:

1) Has it been 12 months or more since your last menstrual period?

   Yes ☐ No ☐

   What was the date of your last menstrual period? _____

2) Have you taken contraceptives or prescribed hormone replacement therapy (HRT) containing estrogen in the past (3) months?

   Yes ☐ No ☐

   If Yes, Medication Name_____

3) Do you have any type of thyroid disease?

   Yes ☐ No ☐

4) Do you have Raynaud's Syndrome?

   Yes ☐ No ☐

5) If you have any of the following current breast symptoms today, please circle the symptom and location of the symptom:

	Please circle one location in each column:			If applicable:
a. Pain	Right Breast Left Breast	Top Bottom	Inner Outer	Periareolar Periareolar

b.	Swelling	Right Breast Left Breast	Top Bottom	Inner Outer	Periareolar Periareolar
c.	Lump	Right Breast Left Breast	Top Bottom	Inner Outer	Periareolar Periareolar
d.	Changes in physical size	Right Breast Left Breast	Top Bottom	Inner Outer	Periareolar Periareolar
e.	Skin discoloration, rash, or orange peel texture	Right Breast Left Breast	Top Bottom	Inner Outer	Periareolar Periareolar

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Patient ID (University of Toledo)