Clinical Study Protocol

Study Title: Wireless Disposable SpO2 Sensor Hypoxia Testing [redacted]

Study Number: 2023-061-MS-GES

Version: 2.0; 08JAN2024

NCT Number: NCT06211530

Sponsor: GE HealthCare Technologies Inc.
3000 N. Grandview Blvd
Waukesha, WI 53188

Sponsor Contact: See Appendix C– Administrative Structure of Investigation

FOR QUALIFIED INVESTIGATORS, STUDY STAFF, AND THEIR ETHICS COMMITTEE(S) ONLY

CONFIDENTIALITY STATEMENT

Information in this RESEARCH STUDY PROTOCOL is for investigators, site personnel involved with the study, ethics committee(s), and/or their authorized representative(s) except as required to obtain consent from study participants or as otherwise required by law. Once signed, the terms of the protocol are binding for all parties.

The Sponsor and Investigators have approved this protocol version, and I confirm hereby to conduct the study according to the protocol and per applicable principles of the World Medical Association Declaration of Helsinki and Good Clinical Practice (GCP) guidelines as per ISO 14155, any conditions of approval imposed by the reviewing ethics committee (EC) or governing regulatory body, and applicable local and federal laws and regulations. The investigator should not deviate from this protocol except for emergency use. I have read and understood and agree to abide by all the conditions and instructions contained in this protocol.

Local Principal Investigator at study site:

Investigator Signature	Date
Print Name	
Site Name, Department, Address	

Local Co-Investigator at study site:

Co-Investigator Signature	Date
Print Name	
Site Name, Department, Address	

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DOCUMENT AND VERSION CONTROL

This section records all changes made to the protocol for a specific study. In the table below, record every relevant change by indicating what changes have been made.

Version	Date	Author	Comments/Changes
1.0	13/DEC/2023	[redacted] [redacted]	Clinical Writer Research Program Integrator Initial version
2.0	08/JAN/2024	[redacted]	Updated code of conduct information to include the following language for IRB approval: Section 9 (page 32) The study will be conducted in accordance with the Declaration of Helsinki, 21 CFR 50, and 21 CFR 812 for non-significant risk device study investigations. The study will not commence until the approval has been received from the IRB.

LIST OF ABBREVIATIONS AND TERMS

AE	Adverse Event
ADE	Adverse Device Effect
AFAP	As far As Possible
ASADE	Anticipated Serious Adverse Device Effects
BMI	Body Mass Index
CIP	Clinical Investigation Plan
CFR	Code of Federal Regulations
COHb	Carboxyhemoglobin
ECG	Electrocardiogram
eCRFs	Electronic Case Report Forms
$EtCO_2$	End-tidal carbon dioxide
FDA	Food and Drug Administration
GCP	Good Clinical Practice (see ISO 14155:2020)
GEHC	GE HealthCare
IRB	Investigational Review Board
ISO	International Organization for Standardization
ITA	Individual Topology Angle
MST	Monk Skin Tone
PI	Principal Investigator
SADE	Serious Adverse Device Effect
SAE	Serios Adverse Event
SaO_2	Arterial oxygen saturation
SpO_2	Oxygen saturation as measured by pulse oximetry
USADE	Unexpected Serious Adverse Device Event

SYNOPSIS	
Sponsor:	GE HealthCare Technologies Inc.
Research Type:	This is a clinical, open label, non-randomized, prospective research study.
Regulatory Status:	This is a pre-market research study of the following devices: Wireless Disposable SpO2 Sensor
Background and Rationale:	[redacted] [redacted] [redacted] [redacted] Here we will collect SpO2 data with simultaneous transfer standard SpO2 [redacted] Transfer standard is a validated pulse oximetry equipment with a calibration directly traceable to CO-oximetry. Test method and protocol is developed according to ISO 80601-2-61:2017 annex EE.3 (PROCEDURE for non-invasive laboratory testing on healthy adult volunteers). Funding for this study will be provided by GE HealthCare (GEHC). [redacted]

Procedures/ Methods:	Procedures/Methods according to ISO 80601-2-61:2017 annex EE.3 (PROCEDURE for non-invasive laboratory testing on healthy adult volunteers) and FDA pulse oximetry guidance (Pulse Oximeters - Premarket Notification Submissions [510(k)s]: Guidance for Industry and Food and Drug Administration Staff, March 2013). [redacted] 9. [redacted]

10. [redacted]

	[redacted]
Objectives:	**Primary Objective:** The primary objective is to collect SpO2 data with simultaneous transfer standard SpO2 measurements (simulating blood sample SpO2) [redacted] **Safety Objective:** The safety objective is to collect safety information, including type and number of AEs, SAEs, and device issues.
Endpoints:	The study endpoint is to collect SpO2 data with simultaneous transfer standard SpO2 measurements data on participants [redacted] Study endpoint will be achieved when [redacted] stabile transfer standards [redacted] and the test device SpO2 comparison at SpO2 plateaus are distributed evenly in [redacted] SpO2 range.

Eligibility Criteria:	**Inclusion criteria:** Participants who meet the following criteria will be included: 1. Participant is adult 18-50 years of age. 2. Biological Male or female of any race 3. Participant is a non-smoker or who has not smoked within 2 days prior. 4. Participant must have the ability to understand and provide written informed consent. 5. Participant is adult must be willing and able to comply with study procedures and duration.	**Exclusion criteria:** Participants who meet any of the following criteria will be excluded from the study: 1. Participant is considered as being morbidly obese (defined as BMI >39.5) 2. Compromised circulation (i.e., Raynaud's Syndrome), injury, or physical malformation of fingers, toes, hands, ears or forehead/skull or other sensor sites which would limit the ability to test sites needed for the study. (Note: Certain malformations may still allow participants to participate if the condition is noted and would not affect the particular sites utilized). 3. Tattoo in the optical path which would limit the ability to test sites needed for the study. 4. Females who are pregnant - confirmed by self-performed and self-reported positive urine pregnancy test performed on the day of the study unless the participant is known to be not of child-bearing potential 5. Participants who have smoked in the last 2 days or participants who have refrained, for at least 48 hours, with COHb levels >3% as assessed per site standard operation procedure. 6. Participants with self-reported respiratory conditions such as: o uncontrolled / severe asthma, o flu, o pneumonia / bronchitis, o shortness of breath / respiratory distress, o unresolved respiratory or lung surgery, o emphysema, COPD, lung disease o Recent COVID (last 2 months) 7. Participants with self-reported heart or cardiovascular conditions such as: o have had cardiovascular surgery, except successful minor surgery without clinical symptoms (i.e., PFO, PDA) o chest pain (angina) o previous heart attack o blocked artery o unexplained shortness of breath o congestive heart failure (CHF) o history of stroke o transient ischemic attack

		○ carotid artery disease ○ myocardial ischemia ○ myocardial infarction ○ cardiomyopathy ○ Cardiovascular implantable active medical device (such as pacemaker or automatic defibrillator) ○ Heart rhythms other than a normal sinus rhythm or with respiratory sinus arrhythmia ○ High blood pressure: systolic >140 mmHg or diastolic >90 mmHg on 3 consecutive readings 8. Participants with self-reported health conditions such as: ○ diabetes, ○ uncontrolled thyroid disease, ○ kidney disease / chronic renal impairment, ○ history of seizures (except childhood febrile seizures), ○ epilepsy, ○ history of unexplained syncope, ○ recent history of frequent migraine headaches, ○ recent symptomatic head injury (within the last 2 months), ○ Cancer requiring chemotherapy, radiation, or currently on treatment 9. Participants with self-reported known clotting disorders ○ history of bleeding disorders or personal history of prolonged bleeding from injury ○ history of blood clots ○ hemophilia ○ current use of blood thinner: prescription or daily use of aspirin ○ Sickle Cell Trait or Disease 10. Participants with severe contact allergies to standard adhesives, latex, silicone, or other materials found in pulse oximetry sensors, ECG electrodes, respiration monitor electrodes or other medical sensors (self-reported) 11. Unwillingness or inability to remove colored nail polish or non-clear artificial nails from test digits 12. Surgical hardware in pathway which would limit the ability to test sites needed for the study 13. Other known health condition, should be considered upon disclosure in health assessment form

Sample Size and Sites:	The study includes a minimum of 30 participants. [redacted] [redacted] Participant population: Healthy non-smoking, male and female, adults of varying skin tones, ages 18 to 50 years. Intended region, and site information: [redacted]
Expected Participant Participation Duration:	The average duration of participant participation is approximately 90 minutes.
Study Completion:	The study will be deemed completed once the last visit of the last participant is completed within 6 to 8 business days.

1. BACKGROUND AND JUSTIFICATION

[redacted]

Here we will collect SpO2 data with simultaneous transfer standard SpO2 [redacted] Transfer standard is a validated pulse oximetry equipment with a calibration directly traceable to CO-oximetry. Test method and protocol is developed according to ISO 80601-2-61:2017 annex EE.3 (PROCEDURE for non-invasive laboratory testing on healthy adult volunteers).

Funding for this study will be provided by GE HealthCare (GEHC).

2. DEVICE/PRODUCT DESCRIPTION

2.1 Identity, Mechanism, and Function

Name:	Portrait Mobile Monitoring Solution [redacted] sensors
Modality/Type:	Life Care Solutions (LCS) – Monitoring Solutions
Manufacturer:	GE HealthCare (GEHC)
Software version:	Portrait Mobile Patient monitor (Hub): [redacted]
	Sensor Battery: [redacted]
	SpO2 Sensor: [redacted]
Regulatory Status:	Pre-market

The investigational devices will be exclusively used for research purposes and labeled in compliance with local regulations.

2.2 Intended Use

The study plans to collect SpO2 data with simultaneous transfer standard SpO2 [redacted]

2.3 Packaging and Labeling

Research conducted for this study will utilize investigational devices and devices cleared through the 510k regulatory process. [redacted]

The Instructions for Use (IFUs) are provided as separate documents from this protocol.

2.4 Concomitant/Ancillary Administrations

2.4.1 Medications and Biologic Products

Medical grade oxygen and nitrogen are used in this study [redacted]

2.4.2 Laboratory Tests and Sample Processing

[redacted] No sample processing is planned as part of the study procedures.

2.5 Accountability

Accurate and adequate records will be maintained for all devices, from time of shipment to the sites until return or disposal of all devices issued by the Sponsor as part of this study, as required by applicable laws and regulations. The Principal Investigator will be responsible for the security and integrity of research devices/products at the investigational site during the study.

2.5.1 Issuance

The devices will be provided by the Sponsor, GEHC and administered by the healthcare professional and site study coordinator. User training is provided before device administration.

2.5.2 Disposition

The devices will be dispositioned after the study by returning to the Sponsor, per applicable safety instruction, laws, and regulations. Unused investigational single-use accessories provided to the site during the study shall be returned to the Sponsor, GEHC. Used single-use medical devices/accessories, e.g., electrodes shall be disposed according to the hospital/investigational site policy.

2.6 Anticipated Risks and Benefits

The device/product under study has undergone risk assessment, per International Standards Organization (ISO) 14971, and risks have been mitigated to levels as far as possible (AFAP).

[redacted]

The risks of investigational units have been analyzed. The risks will be mitigated by safety verification of each investigational unit and labeling before use in the study. Labeling mitigations are included in the investigational device Instructions for Use (IFU) and/or operating manuals, which will be provided to the site.

The risks of study participation are not expected to be greater than those of similar procedures as described in ISO 80601-2-61:2017 Annex EE.3 standard methods routinely conducted in earlier testing. There are no expected risks to participants, operators, or others in this study beyond those of routine/similar devices/products in clinical care post-study care or follow-up is not required by this study.

The risks of study participation are not expected to be greater than those of similar patient monitoring procedures routinely conducted in clinical practice.

Participants are not expected to benefit directly from study participation. The results may benefit future patients by helping to better understand the devices used in the study.

2.6.1 Risk Category and Rationale

Under the United States Food and Drug Administration (USFDA) Guidance Document on Pulse Oximeters for Premarket Notification Submissions [510(k)], USFDA "believes pulse oximeters addressed by the guidance document are non-significant risk devices; therefore, the study would be participant to the abbreviated requirements of 21 CFR 812.2(b)." Hence, it can be stated that the [redacted] sensors and components, as used in this study, are not considered a significant risk device, per the USFDA 21 CFR §812.3(m) definition:

1) it is not intended as an implant;
2) is not purported or represented to be for a use in supporting or sustaining human life;
3) is not for a use of substantial importance in diagnosing, curing, mitigating, or treating disease, or otherwise preventing impairment of human health;
4) and it does not otherwise present a potential for serious risk to the health, safety, or welfare of a participant.

The application of risk management analysis to the investigational units conforms to EN ISO 14971:2007. For continued safe use of the investigational units, the instructions for use shall be followed.

2.6.2 Device/Product Classification and Rationale

[redacted] LED platform is intended for use in the measurement of oxygen saturation (SpO_2) by non-invasive pulse oximetry. The FDA has classified such devices as Class II.

3 OBJECTIVES AND ENDPOINTS

3.1 Purpose of the Study

The purpose of the [redacted] SpO2 sensor accuracy study with human volunteer participants is to collect SpO2 data from [redacted] prototype sensors and reference data [redacted]

3.1.1 Primary Objective

The primary objective is to collect SpO2 data with simultaneous transfer standard SpO2 measurements (simulating blood sample SpO2) [redacted]

3.1.2 Safety Objective(s):

The safety objective is to collect safety information, including type and number of AEs, SAEs, and device issues.

3.1.3 Study Endpoints

The study endpoint is to collect SpO2 data with simultaneous transfer standard SpO2 measurements data on participants [redacted]

Study endpoint will be achieved when [redacted] a minimum of [redacted] stabile transfer standards [redacted]

4 STUDY DESIGN

4.1 Summary of Study Design

This is a pre-market, open label, prospective, non-randomized clinical research study.

[redacted]

The study will be considered complete when the last visit of the final participant is completed.

The maximum duration of participant participation is approximately 1 hour (typical data collection <1 hour) from the application of the sensors to the participant.

This study is not intended to support a comparative claim, such as superiority or non-inferiority, so no control group is necessary.

4.2 Study Population

Participant Population: Non-smoking, male, and female adults of varying skin tones, ages 18 to 50 years.

Site information: [redacted]

4.3 Number of Participants

The study includes a minimum of 30 participants [redacted]

4.4 Eligibility Criteria

4.4.1 Inclusion Criteria

Participants who meet the following criteria will be included:

1. Participant is adult 18-50 years of age
2. Biological Male or female of any race
3. Participant is a non-smoker or who has not smoked within 2 days prior.
4. Participant must have the ability to understand and provide written informed consent.
5. Participant must be willing and able to comply with study procedures and duration.

4.4.2 Exclusion Criteria

Participants who meet any of the following criteria will be excluded from the study:

1. Participant is considered as being morbidly obese (defined as BMI >39.5)
2. Compromised circulation (i.e., Raynaud's Syndrome), injury, or physical malformation of fingers, toes, hands, ears or forehead/skull or other sensor sites which would limit the ability to test sites needed for the study. Note: Certain malformations may still allow participants to participate if the condition is noted and would not affect the particular sites utilized.
3. Tattoo in the optical path which would limit the ability to test sites needed for the study.
4. Females who are pregnant - confirmed by self-performed and self-reported positive urine pregnancy test performed on the day of the study unless the participant is known to be not of child-bearing potential

5. Participants who have smoked in the last 2 days or participants who have refrained, for at least 48 hours, with COHb levels >3% as assessed per site standard operation procedure.
6. Participants with self-reported respiratory conditions such as:
    - uncontrolled / severe asthma,
    - flu,
    - pneumonia / bronchitis,
    - shortness of breath / respiratory distress,
    - unresolved respiratory or lung surgery,
    - emphysema, COPD, lung disease
    - Recent COVID (last 2 months)
7. Participants with self-reported heart or cardiovascular conditions such as:
    - have had cardiovascular surgery, except successful minor surgery without clinical symptoms (i.e., PFO, PDA)
    - chest pain (angina)
    - previous heart attack
    - blocked artery
    - unexplained shortness of breath
    - congestive heart failure (CHF)
    - history of stroke
    - transient ischemic attack
    - carotid artery disease
    - myocardial ischemia
    - myocardial infarction
    - cardiomyopathy
    - Cardiovascular implantable active medical device (such as pacemaker or automatic defibrillator)
    - Heart rhythms other than a normal sinus rhythm or with respiratory sinus arrhythmia
    - High blood pressure: systolic >140 mmHg or diastolic >90 mmHg on 3 consecutive readings
8. Participants with self-reported health conditions such as:
    - diabetes,
    - uncontrolled thyroid disease,
    - kidney disease / chronic renal impairment,
    - history of seizures (except childhood febrile seizures),
    - epilepsy,
    - history of unexplained syncope,
    - recent history of frequent migraine headaches,
    - recent symptomatic head injury (within the last 2 months),
    - Cancer requiring chemotherapy, radiation, or currently on treatment
9. Participants with self-reported known clotting disorders
    - history of bleeding disorders or personal history of prolonged bleeding from injury
    - history of blood clots
    - hemophilia
    - current use of blood thinner: prescription or daily use of aspirin
    - Sickle Cell Trait or Disease
10. Participants with severe contact allergies to standard adhesives, latex, silicone, or other materials found in pulse oximetry sensors, ECG electrodes, respiration monitor electrodes or other medical sensors (self-reported)

[redacted]

[redacted]

- [redacted]
- [redacted]

4.7 Criteria for Withdrawal/Discontinuation

A participant may withdraw from study participation at any time, for any reason. The Investigator may withdraw a participant at any time, for any reason. The reasons for withdrawal and discontinuation of any participant shall be recorded on an eCRF. These will be reported to the Sponsor. The EC should be notified per their notification of participant withdrawal policy.

Participants who withdraw prior to completion of all study procedures may have their completed data used as part of the study.

- The participant's failure to cooperate fully (as determined by the investigator in his or her sole discretion) with the required conduct of this study.
- The participant's development of an illness as determined by the investigator in his or her sole discretion.
- A determination by a Element representative (in his or her sole discretion), for whatever cause, that the study should be discontinued.
- A determination by the sponsor (in his or her sole discretion), for whatever cause, that the study should be discontinued

The collection of data for study participants will cease in the following cases:

- Participant completes all study requirements
- Participant withdraws consent
- Investigator's decision that it is in participant's best interest to be discontinued from the study
- Participant death
- Adverse event other than death requiring withdrawal of the participant from the study
- Determination that the participant was ineligible for the study.
- Study Stopped due to Technical Problems
- Study may be stopped due to Protocol Deviation
- Study Terminated by Sponsor
- Development of any cardiac arrhythmia, except sinus arrhythmia <120 bpm
- Development of clinically significant ST or T segment changes in the ECG
- Symptomatic sinus tachycardia ≥120 bpm
- Onset of significant PVCs or PACs per clinician and/or gas controller discretion
- The lowest target is [redacted] SpO2. [redacted]

There will not be any follow-up procedures for withdrawn or discontinued participants required, unless a follow-up is required at the Investigator's discretion.

5 STUDY PROCEDURES

5.1 Procedure General Information

[redacted]

All procedures/methods will be performed according to ISO 80601-2-61:2017 annex EE.3 (PROCEDURE for non-invasive laboratory testing on healthy adult volunteers) and FDA pulse oximetry guidance (Pulse Oximeters - Premarket Notification Submissions [510(k)s]: Guidance for Industry and Food and Drug Administration Staff, March 2013).

[redacted]

[redacted]

5.2 Desaturation Study Gas Delivery System

The [redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

5.2.1 Control Oximetry System

The Control Pulse Oximeter, an FDA cleared device, is used to monitor the oxygen saturation levels real time throughout the study for participant safety and to target stable plateaus. This device is used to assess the stability of the data.

- [redacted]

5.2.2 Safety Equipment

Multi-parameter monitor used during the study to observe a participant's vital signs including ECG tracing, heart rate, respiratory rate, end-tidal CO2 with capnograph, secondary monitor for the oxygen concentration being delivered to the participant. This device will also serve as the pulse rate reference.

- [redacted]

5.2.3 Breathing Apparatus for Participant

[redacted]

5.2.4 Transfer Standard / Control Oximetry System

The Transfer Standards have been previously compared to Arterial blood draws as measured by CO-Oximetry.

- [redacted]

5.3 Participant Preparation

Study staff will confirm that the participant is eligible and complies with applicable site requirements prior to starting study procedures. No preparation beyond that required by the investigational site is required before procedures.

5.4 Description of Study Procedures

1. Perform health assessment and same day health screening. Take the participant's blood pressure and record values.
2. Once participant has met all inclusion criteria, written informed consent shall be performed by a member of the study team. Each participant will be given a signed copy of the consent form prior to release.

3. Complete Equipment checkout list prior to starting study. [redacted]
4. Set the locks clocks to sync data collection [redacted]
5. Apply ECG leads to the participant, review for normal sinus rhythm or respiratory sinus arrhythmia.
6. Setup [redacted] collection system.
7. Record device information for tracking on eCRF [redacted]
8. Record participant information. Participant number and demographics information for participant description. [redacted]
9. [redacted]
10. Participant will be advised during the study that they may stop the test at any time.
11. Apply the test device(s) to the participant. Apply sensors to the participant [redacted]. [redacted] Take an image of the sensor placement and record the sensor sites and sensor types on the eCRF. [redacted].

[redacted]

12. Apply the other devices [redacted]

13. [redacted] sensors [redacted] and record on test form.
14. [redacted]
15. Allow readings to stabilize.
16. [redacted] start gas flow. Verify that FiO2 [redacted] level [redacted] The Delivery system will be set to [redacted] to allow the gas controller to adjust the levels [redacted]
17. Start data collection system.
18. [redacted].
19. [redacted]
20. Data from [redacted] SpO2 plateaus. [redacted].
21. The clinician monitors and records [redacted] information [redacted] The clinician will monitor the participant's wellbeing per the sites standard operating procedures throughout the test.
22. The gas controller monitors the gas delivery and data collection system to ensure proper functionality. [redacted]
23. The test may be stopped at any time by the participant, the clinician, the gas controller. [redacted].
24. During the study, the participant may be re-saturated [redacted]
25. Once the lowest [redacted] has been achieved and data collection has been completed, the participant will be given a gas mixture returning him/her to baseline levels.
26. Stop the data collection [redacted]
27. The breathing circuit is disconnected, and the participant is monitored for a few minutes to ensure he/she maintains normal baseline levels.
28. All equipment will be removed from the participant.
29. The clinician will review any final questions with the participant and ask if there were any effects from the study. The participant follow-up form will be completed, and the participant will be released with no further follow up required.
30. Data from [redacted] is transferred/uploaded to sponsor [redacted]

5.5 Follow-up

This study does not require follow-ups. The Sponsor is responsible for assuring that the study device fulfills the biomedical safety and standards requirements of the investigational site.

No follow-up will be conducted after the participant's participation has ended. The participant will be followed for AEs from the time the research device is connected to the participant until it is removed. In addition, all AEs, including those involving delayed reactions, will be followed through to resolution.

Any data, including images, collected for the participant, up until the time of withdrawal or discontinuation, may still be included in the study results and provided to the Sponsor, unless the participant requests that their data not be used. The site shall document all requests by participants regarding their data use.

6 STUDY DATA COLLECTION AND ASSESSMENTS

Only data relevant to the conduct of the study shall be collected by the Sponsor. [redacted]

During the study procedures, electronic data collection shall take place. [redacted]

[redacted]

6.1 Primary Assessment

During the study period, the following participant information shall be collected if available:

1) Demographics to include age, biological sex race, and ethnicity.
2) Vitals to include height (cm), weight (kg/g), BMI, blood pressure, SpO2 readings.
3) Skin tone [redacted] assessed from [redacted] with a Monk Skin Tone Scale.
4) [redacted]
5) [redacted]
6) Location of sensors
7) Date and time of study procedures
8) Test set-up information

6.2 Safety Assessments

The description, severity, and device relatedness of any AE or SAE during the study will be recorded. Participants will, if necessary, be provided with emergency care. In the event of any device issues, the event will be recorded. Safety reporting will be conducted as described in this protocol.

7 QUALIFICATION AND TRAINING PLAN

7.1 Staff Qualifications

All members of the study staff participating in the conduct of the investigation shall be qualified by education, training and/or experience to perform their tasks, and this shall be documented appropriately, per ISO 14155:2020 for clinical studies. Study staff and the PI's qualification for the study will be verified by collecting their CV's and GCP certifications. Study staff and the PI will be trained for the study processes and devices during Site Initiation Visit prior to study initiation. All the training will be recorded on training logs. If study staff or PI qualification lapses, the Sponsor will work with the site to requalify the respective role or ensure the duties are reassigned appropriately by the site. The Sponsor

reserves the right to disqualify PI with appropriate justification, such as repeated issues that impact participant safety and data integrity.

7.2 Training Plan for the Protocol and Research Device/Product

The Sponsor will provide training for all participants involved in the study. This includes any individual that will operate any equipment involved in the study, collect any data that is a part of the study, analyze any data associated with the study, or is in any other way involved with the study. Training to the site personnel will be conducted prior to the first subject enrolled.

The following training information will be collected in the training log prior to study enrollment:

- Title of Training
- Training objectives
- Training logistics (who conducts training and training method)
- Target audience (who will be trained)
- Training content (including device operation, protocol review, ICF, other documentation needed)

Study staff directly operating or maintaining the research device or product will be trained based on the training plan and qualified based on experience, and the hospital/clinical site policy.

The PI will be ultimately responsible for execution of this study per the protocol and for device/product use in this study by members of the study staff.

8 SAFETY

8.1 Anticipated Adverse Events

Being in this study involves some foreseeable risks.

There is always a chance of unexpected risks. Throughout the study, the Sponsor will evaluate and update safety information in study documents. In case of unexpected risks appearing, FDA will be informed by the Sponsor.

Participants will be closely monitored by study staff, and testing will be discontinued if more than minor discomfort or any signs or symptoms that could indicate medically important adverse effects related to testing are observed.

8.2 Safety/Anticipated AE Risks

Laboratory Testing

The risk determination is based on the use of the device in an investigation in addition to the device itself. Generally, the FDA believes pulse oximeters as addressed in the FDA Guidance Document for Pulse Oximeters[7] are non-significant risk devices. Further, the recommendation is to conduct the study in accordance with Clause 201.12.1.101.2 and Annex EE.2 of ISO 80601-2-61:2017, where Annex EE.2 describes the procedure for invasive laboratory testing on healthy volunteers.

Controlled Desaturation Study

Desaturation of the participant involves the administration of oxygen/nitrogen mixtures that are less than that of normal air, i.e., less than 21% oxygen. [redacted] During the test, the participant is

closely monitored and constant communication regarding the participant's comfort and sense of well-being is assessed. The ECG, pulse oximetry saturation, oxygen saturation levels, and EtCO2 are monitored. Since 1983 we have performed these types of tests in this and other laboratories where we conducted approximately 8,900 desaturation tests with no significant negative events.

The mask allows gas for maximum delivery. The mask is made of soft flexible plastic so as to minimize the discomfort level as much as is reasonably possible. Materials may cause some skin irritations.

Pulse Oximetry Sensor

Pulse Oximetry Sensor placement involves positioning pulse oximetry sensors on the volunteer participant in the same manner that is used on hospitalized patients. The sensors may be warm to the touch. Under normal operating conditions, (no fault conditions), the sensors are not expected to overheat. If the sensors are too warm, they will be removed immediately. If the sensors are too uncomfortable, they will be removed immediately. Adhesive sensors or tape may cause some irritations to the skin in some participants. Every effort will be made to minimize products with natural rubber or latex. Products containing natural rubber or latex will be identified. The risk in the use of pulse oximetry sensors is believed to be minimal.

ECG Electrodes

Materials (such as the adhesive and/or gel contact) used in the electrodes may cause some skin irritations in some participants. Typical skin irritations present with redness of skin and in some cases of sensitivity is an allergic reaction. Because the adhesive is aggressive on the ECG pads, it may cause pulling of the skin or hair upon removal. Biocompatibility testing for surface contact electrodes is a requirement of the International Standards Organization (ISO) 10993 – Biological Evaluation of Medical Devices. The risk in the use of ECG electrodes is believed to be minimal.

Blood Pressure Cuff

The reported risks associated with NIBP include A) slight discomfort upon inflation of the cuff, B) possible bruising, C) petechial rash, and D) discoloration of the skin beneath the cuff. In rare instances the reported risks associated with NIBP include A) peripheral nerve injuries, B) skin tear, and C) compartment syndrome (swelling of muscles in the limb causing the reduction of the blood supply to the muscle). Through literature searches of other studies, we found the complications of taking repeated blood pressures were temporary and involved either bruising/rash; for example, petechiae rash (less than 2.2%), skin redness/lines (0.8%), or tingling/discoloration in the extremity wearing the cuff while the cuff is inflated (0.1%).

It is possible that the test participant may experience an allergic reaction to the material in the cuff.

Heating Pad / Hot Water Bottles

A heating pad or hot water bottles may be used [redacted] Mild discomfort can be expected if it is too warm. To minimize the discomfort, the participant will be asked about comfort level. If the heating is too warm, it will be turned on the lowest level possible, removed or additional separation will be used between the heater and the site for comfort.

8.3 Adverse Event Definitions

Adverse Event Definitions

The definitions for adverse event, adverse device effect, serious adverse event, serious adverse device effect, unanticipated adverse device effect, and their classifications are provided below (ISO 14155, 21 CFR 812.3).

Adverse Device Effect (ADE): Adverse event related to the use of an investigational medical device resulting from insufficiencies or inadequacies in the instructions for use, the deployment, installation, the operation, or any malfunction of the investigational medical device or from error use.

Adverse Event (AE): Any untoward medical occurrence, unintended disease or injury or any untoward clinical signs (including an abnormal laboratory finding) in participants, users or other persons whether or not related to the investigational medical device or investigational procedure.

Anticipated Serious Adverse Device Effects (ASADE): ASADE is an effect which by its nature, incidence, severity or outcome has been identified in the risk analysis report.

Mild: a mild adverse event is one in which the participant is aware of the event, but it is easily tolerated without intervention.

Moderate: a moderate adverse event is one that causes sufficient discomfort to interfere with usual activities.

Serious Adverse Device Effect (SADE): adverse device effect that has resulted in any of the consequences characteristic of a serious adverse event.

Serious Adverse Event (SAE): a serious adverse event is an adverse event that results in death, inpatient hospitalization, severe or permanent disability, a life-threatening illness or injury, fetal distress, fetal death, a congenital abnormality, a birth defect, or medical or surgical intervention to prevent permanent impairment to body or structure.

Severe: a severe adverse event is one that results in the inability to perform usual activities.

Unanticipated serious adverse device effect (USADE): a serious adverse device effect, which by its nature, incidence, severity, or outcome has not been identified in the current version of the risk analysis report [ISO 14155:2011 3.42]. In the United States, any serious adverse effect on health or safety or any life-threatening problem or death caused by, or associated with, a device, if that effect, problem, or death was not previously identified in nature, severity, or degree of incidence in the study documents, will be reported in accordance with 21 CFR §812.3 and applicable laws and regulations.

8.4 Documentation of Adverse Events

All adverse events (AE), including all serious adverse events (SAE), are required to be collected, investigated, and documented. AEs will be collected from [describe the reporting period, e.g., from the time they enter the scan room to the time they leave the scan room]. All AEs will be followed through to their resolution. Documentation will include:

- Description of Event
- Date of onset
- Date of resolution unless resolution does not occur during study reporting period. In the instance that resolution does not occur, the status of the AE will be documented (not resolved/recovered or resolving/recovering)
- Severity (mild, moderate, or severe)
    - *Mild*: Symptom(s) barely noticeable to the participant or does not make the participant uncomfortable. The AE does not influence performance or functioning. Prescription drugs are not ordinarily needed for relief of symptom(s).
    - *Moderate*: Symptom(s) of sufficient severity to make the participant uncomfortable. Performance of daily activities is influenced. Treatment of symptom(s) may be needed.
    - *Severe*: Symptom(s) of a sufficient severity to cause the participant severe discomfort. Treatment for symptom(s) may be given.
- Serious (yes/no)

- Causal relationship to investigational or comparator medical device? (not related, possible, probable, or causal relationship)
    - *Not related*: Relationship to the device, comparator or procedures can be excluded when:
        - the event has no temporal relationship with the use of the investigational device, or the procedures related to application of the investigational device;
        - the serious adverse event does not follow a known response pattern to the medical device (if the response pattern is previously known) and is biologically implausible;
        - the discontinuation of medical device application or the reduction of the level of activation/exposure - when clinically feasible - and reintroduction of its use (or increase of the level of activation/exposure), do not impact on the serious adverse event;
        - the event involves a body-site or an organ that cannot be affected by the device or procedure;
        - the serious adverse event can be attributed to another cause (e.g., an underlying or concurrent illness/clinical condition, an effect of another device, drug, treatment or other risk factors);
        - the event does not depend on a false result given by the investigational device used for diagnosis, when applicable;

      In order to establish the non-relatedness, not all the criteria listed above might be met at the same time, depending on the type of device/procedures and the serious adverse event.
    - *Possible*: The relationship with the use of the investigational device or comparator, or the relationship with procedures, is weak but cannot be ruled out completely. Alternative causes are also possible (e.g., an underlying or concurrent illness/ clinical condition or/and an effect of another device, drug or treatment). Cases where relatedness cannot be assessed, or no information has been obtained should also be classified as possible.
    - *Probable*: The relationship with the use of the investigational device or comparator, or the relationship with procedures, seems relevant and/or the event cannot be reasonably explained by another cause.
    - *Causal relationship*: the serious adverse event is associated with the investigational device, comparator or with procedures beyond reasonable doubt when:
        - the event is a known side effect of the product category the device belongs to or of similar devices and procedures;
        - the event has a temporal relationship with investigational device use/application or procedures;
        - the event involves a body-site or organ that
            - the investigational device or procedures are applied to;
            - the investigational device or procedures have an effect on;
        - the serious adverse event follows a known response pattern to the medical device (if the response pattern is previously known);
        - the discontinuation of medical device application (or reduction of the level of activation/exposure) and reintroduction of its use (or increase of the level of activation/exposure), impact on the serious adverse event (when clinically feasible);
        - other possible causes (e.g., an underlying or concurrent illness/clinical condition or/and an effect of another device, drug or treatment) have been adequately ruled out;
        - harm to the participant is due to error in use;
        - the event depends on a false result given by the investigational device used for diagnosis, when applicable;

      In order to establish the relatedness, not all the criteria listed above might be met at the same time, depending on the type of device/procedures and the serious adverse event.
- Causal relationship to investigational procedure? (not related, possibly related, probably related, or causal relationship)

- Treatment given and/or action taken (procedure stopped, withdrawn from study, or no action)
- Anticipated (yes/no)
- Signals from AE that might indicate a serious health threat.

8.5 Reporting of Safety Events

The following events are to be reported to the Sponsor within 72 hours of the event occurrence and to the EC per their policy:

- All SAEs and USADEs
- All device issues that could possibly lead to an SAE
- Any signal from an AE that might indicate a serious health threat
- Unanticipated AE and unanticipated ADEs

Additional follow-up information may be requested by the Sponsor. In addition, safety information may be shared with regulatory agencies and other participating sites, as required by applicable law and regulation.

The Sponsor contact for reporting safety events:

Research Program Integrator (see Appendix C)

e-mail: [redacted]

8.6 Reporting of Device Deficiencies/Complaints

Device deficiency: an inadequacy of a medical device with respect to its identity, quality, durability, reliability, usability, safety, or performance, such as malfunctions, use errors, and inadequacy in the information supplied by the manufacturer including labelling.

Device deficiencies/complaints should be reported to the study Sponsor contact identified on the cover page of this protocol. All device deficiencies/complaints will be collected, fully investigated, and documented in the source document during the study reporting period. The Principal Investigator is responsible for notifying the Sponsor in the event that there is any device issue that could potentially lead to a SAE.

9 ETHICAL CONDUCT OF THE STUDY

The study will be carried out per the protocol and with principles enunciated in the current version of the Declaration of Helsinki; the guidelines of Good Clinical Practice (GCP) for medical devices, as set forth by ISO 14155 and ISO 14971; The study will be conducted in accordance with the Declaration of Helsinki, 21 CFR 50, and 21 CFR 812 for non-significant risk device study investigations. The study will not commence until the approval has been received from the IRB.

The study will be conducted and reported per applicable policies of the Ethics Committee (EC) and governing regulatory authorities.

If national or regional EC requirements are less strict than the requirements of GCP, such as ISO 14155: for medical devices, the Sponsor shall apply the requirements of this International Standard to the greatest extent possible, irrespective of any lesser requirements, and shall record such efforts.

9.1 Ethics Committee

The responsible Principal Investigator at each site will ensure that approval from an appropriately constituted EC is attained for the clinical study prior to enrolling participants, and the PI will ensure that documentation of approval is maintained for the duration of the study.

The PI will ensure that the Sponsor is notified of any withdrawal of EC approval within 5 working days of such occurrence. If approval is terminated or suspended, the Principal Investigator will notify the Sponsor and provide a written explanation.

9.2 Regulatory Agencies and Competent Authority(ies)

GEHC will obtain approval from the local regulatory agency or competent authority, before the start of the clinical trial, if necessary, per applicable local laws and regulations. Any additional requirements imposed by the EC or regulatory authority shall be followed, if applicable.

9.3 Management of Protocol Modifications and Amendments

Substantial amendments will only be implemented after approval of the EC. Non-substantial modifications may be made during the normal course of device optimization, maintenance, and feasibility testing. Non-substantial modifications will be communicated to the competent authority (CA) as soon as possible, if applicable, and to the EC per their policy.

9.4 Management of Protocol Deviations

A deviation is any instance(s) of failure to follow, intentionally or unintentionally, the requirements of the protocol. Under emergency circumstances, deviations from the protocol to protect the rights, safety, and wellbeing of human participants may proceed without prior approval of the Sponsor and the EC/CA. Such deviations shall be documented and reported to the Sponsor and the EC/CA as soon as possible. Deviations will be reported as:

- **Critical Deviations:** Deviations that significantly affect the safety, efficacy, integrity, or conduct of the study. These deviations must be reported to the Sponsor no later than 5 working days from awareness of occurrence and reported to the EC per the deviation reporting policy.
- **Non-Critical Deviations:** Protocol deviations that do not significantly affect the safety, efficacy, integrity, or conduct of the study. These deviations must be documented on the CRF Protocol Deviation page and will be reviewed by the study monitor.

The Sponsor will assess and implement any corrective or preventative actions necessary, such as retraining the study staff and PI.

9.5 Participant Information and Informed Consent

The investigators will explain to each participant the nature of the study, its purpose, the procedures involved, the expected duration of exposure to the investigational device, the potential risks and benefits, and any potential discomforts. Each participant will be informed that participation in the study is voluntary, that he/she may withdraw his/her from the study at any time, and that withdrawal of consent will not affect his/her subsequent medical assistance and treatment. The participant must be informed that his/her study records may be examined by authorized individuals other than the study investigator.

All participant for the study will be provided an informed consent form (ICF), describing the study and providing sufficient information, to allow the participant (i) to make an informed decision about his/her participation in the study, and (ii) to be fully aware of his/her rights under the applicable law. Informed consent documents will be subject to approval by the IRB prior to enrolling subjects in the study.

The participant should read and consider the statement before signing and dating the ICF and shall be given a copy of the signed document. The ICF must also be signed and dated by the investigator (or his/her designee), and it shall be retained as part of the study records.

9.6 Suspension/Early Termination of the Study

Participation in the study is voluntary. The participant may choose to withdraw the participant from the study at any point. If a participant officially withdraws from the study, the laboratory staff will document the reason for withdrawal in the case report.

Participation in the study may also be stopped at any time by the principal investigator or by the sub-investigators or sponsor.
The Sponsor may suspend or terminate the study prematurely for various significant and documented reasons. Reasons for suspension or termination may include but are not limited to insufficient participant recruitment, updated risk profile impacting participant safety, alterations in accepted clinical practice impacting study procedures, early evidence of benefit or harm of the research product, or serious or repeated deviations by the investigator.

Suspension or termination can occur at individual sites or across the study, as applicable. The decision to suspend or terminate the study should be shared in writing with all parties described above.

If the reason for study suspension is resolved, the deciding party shall inform all appropriate parties of the decision and actions to resume study procedures.

All the data collected prior to study suspension or early termination will be stored and can be used by the Sponsor.

Withdrawal of IRB approval shall be reported to the sponsor by the investigator within 2 working days.

In case of early termination of the study, all study participants should be followed until the resolution of any pending adverse event(s).

10 STATISTICAL METHODS

10.1 Statistical Hypothesis

No statistical hypothesis is being tested in this study.

10.2 Sample Size Determination

Per ISO 80601-2-61:2017, at least 200 data pairs from at least 10 subjects are required for adult desaturation test, with SaO_2 values distributed on several saturation plateaus spanning the range of 70-100%.

10.3 Statistical Analysis

Data collected will be analyzed by the GEHC Engineering Team.

10.3.1 General Statistical Methods

Data analysis will follow ISO 80601-2-61, 2017, and the FDA Guidance Document for Pulse Oximeters (FDA Guidance, March 4, 2013). The reference guidance documents clearly define the study, number of subjects, data points needed for the analysis and handling of missing data or data that is removed from the analysis. This is achieved through a minimum of 200 paired observations of Test and Reference values equally distributed over the specified SpO_2 accuracy range (70-100%) of the device under test. The data will be collected on a minimum of 10 healthy adult volunteer subjects who range

in age, gender and skin tone. The controls of the study will be provided in the following manner. A control oximeter will be used to assess the stability of the plateaus for data collection.

10.3.2 Analysis of Primary Endpoint(s)

Data analysis will follow ISO80601-2-61, 2017 and the FDA Guidance Document for Pulse Oximeters (FDA Guidance, March 4, 2013).[8]

10.3.3 Safety Analysis

Safety events will be presented as a listing, and frequency of instances will be calculated. This will be conducted for all participants.

10.4 Handling of Missing Data

Analysis will be based on collected data, and no imputation will be done for missing data. The investigator is obligated to provide written documentation of any missing data to the Sponsor and to provide clarification upon Sponsor request if possible.

10.5 Deviation(s) from the Original Statistical Plan

Any changes or deviations from the original statistical plan specified in this protocol will be described and justified in the study final report per ISO 14155:2020.

11 QUALITY ASSURANCE AND CONTROL

11.1 Data Management

Data management processes for handling study data will be maintained by the Sponsor.

11.2 Completion of Case Report Forms (CRFs)

The data reported on the eCRFs shall be derived from source documents and be consistent with these source documents. Electronic CRFs (eCRFs) will be used to collect data. The Sponsor will provide eCRFs and train study staff on completion of eCRFs using Good Documentation Practices (GDP). eCRF Completion Guidelines (CCG) may be provided by the Sponsor to help facilitate training.

eCRFs are to be completed as information becomes available at the site. eCRFs should be signed by indicated parties, in indicated area(s), to certify the contents of the form. The PI is ultimately responsible for ensuring completion of eCRFs.

If any discrepancies are discovered on the eCRF, whether during monitoring or during data review by the study team, a query will be raised, and the site shall make the correction within the electronic database, noting the reason for change. Data will be considered clean once all queries are answered and closed.

If the Sponsor discovers discrepancies on eCRFs, a query will be raised, and necessary corrections will be made by the site. The reason for any changes will be noted. All queries will be resolved prior to study completion.

11.3 Data Handling and Record Keeping

All documents and data shall be produced and maintained in a manner that assures control and traceability.

[redacted] Only authorized users, as determined by GEHC, are allowed to login and view data in Medidata. Access is controlled through study level, role-based security. [redacted]

11.4 Source Data and Documents

Source data includes information in original records, certified copies of original records of clinical findings, observations, or other activities for the study. Source documents for each participant must be retained throughout the investigation, including printed or electronic documents containing source data. Elements should include:

- **Source data and documentation** relevant to data recorded for participant screening and eCRF corroboration. Questionnaires may be directly entered into the eCRF and therefore considered source**.**
- **Participant records** containing the completed ICFs and (e)CRFs.
- **Regulatory binder** containing the protocol and any subsequent amendments, EC submissions and approvals, blank ICF(s), and site logs.
- **Reference manuals** containing investigator responsibilities, Sponsor, AE/SAE and informed consent guidelines, applicable study aids and training materials, and operator's manuals.

The PI or institution shall provide direct access to source data during and after the clinical investigation for monitoring, audits, EC review, and regulatory authority inspections.

11.5 Archiving

All study data must be archived for a minimum of ten (10) years after study termination or premature termination of the clinical study.

12 MONITORING PLAN

In collaboration with the site, the Sponsor will ensure proper monitoring of the study to confirm that all the research requirements are met. Monitoring visits will oversee the progress of a clinical investigation and ensure that it is conducted, recorded, and reported per the protocol, written procedures, Good Clinical Practice (GCP) ISO 14155:2020, and the applicable regulatory requirements.

12.1 Confidentiality and Data Protection

The investigator affirms and upholds the principle of the participant's right to privacy, and the investigator shall comply with applicable privacy laws. Especially, data privacy will be ensured when presenting the data at scientific meetings or publishing data in scientific journals.

Individual participant medical information obtained because of this study will be considered confidential, and disclosure to third parties will be prohibited. Participant confidentiality will be further ensured by utilizing participant identification code numbers. For data verification purposes, authorized representatives of the Sponsor, a competent authority (CA), or an ethics committee (EC) may require direct access to parts of the medical records relevant to the study, including participant medical history.

A checklist will be maintained identifying the contents of the Trial Master File / Project folder [redacted]

The participant's name will be recorded on the Informed Consent, Health Assessment Form, and a participant participation list. The data collection form will only use a participant number for the day of the test along with participant demographics. A name will not be recorded on the case report form.

Records identifying the participant's name will be kept in a secured location with either a locked file or locked door. Access to these files will be on a limited basis. Potential reviewers of this information include: Element representatives collecting the information and conducting the study, Medical Director for Element, Regulatory Authorities, Department of Health and Human Services (DHHS) agencies, Governmental agencies in other countries, Salus Independent Review Board and representatives of the Sponsor. This group may use the information to conduct independent audits and reviews to verify compliance of the regulatory requirements for these studies but not copy the information.

Data files stored electronically will be associated with a participant based off of participant #, date and by filename recorded on the data collection forms. The original device electronic data files will be preserved in its original form.

Data files, data collection records with participant demographics and participant number may be additionally copied, (after de-identification, if applicable) reviewed and supplied to the commercial sponsor for the study or Contractors associated with Element for data analysis purposes.

All study records will be stored for at least 10 years post the release of the product or project cancellation. The investigator will notify sponsor prior to destruction of study records. Other storage arrangements may be executed per contractual agreement between the sponsor and the investigator.

12.2 Storage of Images and Associated Health Data

All electronic data collected from the participant and associated data will be collected and disclosed to the Sponsor as part of this study.

[redacted]

13 RESEARCH AGREEMENTS

GE HealthCare will fund this clinical investigation, which will be conducted under contractual agreements between the investigational sites and the Sponsor, GE HealthCare. Agreement details for each participating site will be stored by the Sponsor.

13.1 Clinical Study Report and Publication Policy

Prior to recruitment, a description of this clinical investigation will be registered in a publicly accessible database. This database will be updated per regional or national requirements throughout the conduct of the clinical investigation and results will be entered upon completion.

This study may not qualify as an Applicable Clinical Trial (ACT) and information about this trial may not be made publicly available. However, the sponsor may voluntarily register the clinical trial and submit summary results information to the databank. If so, it's possible the results may not be published until after a product is cleared or approved by the FDA. The conditions of publication are described in a separate contractual agreement.

APPENDIX A – STUDY SITE AND INVESTIGATOR LIST

The following investigators at each study site will be responsible for the conduct of this study:

Investigator(s):[1]	[redacted]	[redacted]

[1] The role of the ***Principal Investigator*** is to implement and manage the conduct of the investigation as well as ensure data integrity and the rights, safety, and well-being of humans involved in the study [ISO 14155 9.1]. ***Co-Investigators*** share all responsibilities of the ***Principal Investigator***, and ***Sub-Investigators*** share only those responsibilities designated by the ***Principal Investigator***.

REFERENCES

1. Fouzas S, Priftis KN, Anthracopoulos MB. Pulse oximetry in pediatric practice. *Pediatrics*. Oct 2011;128(4):740-52. doi:10.1542/peds.2011-0271
2. Batchelder PB, Raley DM. Maximizing the laboratory setting for testing devices and understanding statistical output in pulse oximetry. *Anesth Analg*. Dec 2007;105(6 Suppl):S85-S94. doi:10.1213/01.ane.0000268495.35207.ab
3. Gehring H, Duembgen L, Peterlein M, Hagelberg S, Dibbelt L. Hemoximetry as the "gold standard"? Error assessment based on differences among identical blood gas analyzer devices of five manufacturers. *Anesth Analg*. Dec 2007;105(6 Suppl):S24-S30. doi:10.1213/01.ane.0000268713.58174.cc
4. Tin W, Lal M. Principles of pulse oximetry and its clinical application in neonatal medicine. *Semin Fetal Neonatal Med*. Jun 2015;20(3):192-7. doi:10.1016/j.siny.2015.01.006
5. HealthCare G. TruSignal SpO2 Clinical Accessories. *GE Pulse Oximetry Technology*.
6. Foglia EE, Whyte RK, Chaudhary A, et al. The Effect of Skin Pigmentation on the Accuracy of Pulse Oximetry in Infants with Hypoxemia. *J Pediatr*. Mar 2017;182:375-377 e2. doi:10.1016/j.jpeds.2016.11.043
7. FDA -- U.S. Food and Drug Administration. Pulse Oximeters -- Premarket Notification Submissions [510(k)s] - Guidance for Industry and Food and Drug Administration Staff. March 4, 2013. https://www.fda.gov/downloads/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm081352.pdf. *Accessed December 02, 2019*.
8. FDA -- U.S. Food and Drug Administration. *Pulse Oximeters -- Premarket Notification Submissions [510(k)s] - Guidance for Industry and Food and Drug Administration Staff*. 2013. Accessed March 4. https://www.fda.gov/downloads/medicaldevices/deviceregulationandguidance/guidancedocuments/ucm081352.pdf

End of Document

[redacted]

APPROVED BY SALUS IRB: 12 JANUARY 2024

SPONSOR:	GE HealthCare Technologies Inc.
CITY AND STATE:	Waukesha, WI
PROTOCOL NUMBER AND TITLE:	PR2023-568 2023-061-MS-GES "Wireless Disposable SpO2 Sensor Hypoxia Testing [redacted]"
STUDY INVESTIGATOR:	[redacted], NP
STUDY SITE:	[redacted]
24-HOUR TELEPHONE NUMBER:	[redacted]

Informed Consent
The following information describes this study and your rights and obligations as a participant. The study investigator or one of the study staff will answer any questions you may have about this study or this form.

Introduction and Purpose
You are being asked to participate in a research study to evaluate the accuracy of pulse oximetry systems. If at any time during this process you have questions, please ask the study staff to explain the words or information that you do not clearly understand. You will be given a copy of this consent form if you would like to think about or discuss with family and friends before making your decision.

A pulse oximeter is a device which measures the percentage of oxygenated blood, called oxygen saturation (SpO2), in a non-invasive way. The pulse oximeter uses a sensor which attaches to a site on the body, such as the finger, ear, toe, nose, forehead, wrist, chest, hand, or foot. The sensor is optical which allows it to shine light on the site. The receiver portion of the sensor collects the light passing through the site or reflected back from the site.

The purpose of this study is to conduct a direct comparison of an investigational device and an FDA cleared Pulse Oximetry device during non-motion conditions in the range of 70-100% oxygen saturation.

"Investigational" means that the device being tested has not been approved by the United States Food and Drug Administration (FDA) for prescription or over-the-counter use. The following pulse oximetry device in this research study is considered investigational:

- Portrait Mobile [redacted] sensors [redacted] with Portrait Hub patient monitor

APPROVED BY SALUS IRB: 12 JANUARY 2024

The following marketed devices have been cleared by the FDA for use and will be used for comparison to the investigational device and clinical monitoring:

- GE, [redacted] Pulse Oximeter [redacted] Finger sensor and [redacted] cable
- GE, [redacted] Compact Monitor – Multiparameter
- [redacted] Pulse Oximeter with [redacted] Forehead or sensor [redacted] EarClip
- [redacted] Pulse Oximeter with optional additional sensors [redacted],
- [redacted] Finger Sensor (optional)

Participation in Study

You are being asked to participate in this study because we believe you meet the acceptance criteria. Your decision to be in this study is voluntary. There will be a minimum of 30 male and female participants taking part in the study. To participate in this study, you must be 18 to 50 years of age and meet the criteria for participation. To determine your eligibility for this study, you will be asked several questions to assess your current state of health. If you have any medical conditions, you must be honest and provide complete information about them so that consideration can be given for your eligibility to participate in this study.

If you are not completely truthful with the study investigator and study staff regarding your health history, you may be harmed by participating in this study.

The study will take place at the study site listed on page 1. It is expected that your visit will take up to one (1) to one and a half (1.5) hours. If you decide to participate in this study and then change your mind, you can leave the study at any time.

Description of Study / Procedures

Once you have reviewed this information, have had all of your questions answered to your satisfaction and signed the consent, a health assessment form will be provided to you. Upon completing the health assessment form, a health screen will be initiated on the day of your study.

The health screen will include a review of the information you reported in the health assessment form. [redacted] A cuff will be placed on your arm to check your blood pressure, adhesive patches will be placed to check your heart rhythm and heart rate (Electrocardiogram "ECG"), and a pulse oximeter sensor placed on your finger to obtain your oxygen readings. Additionally, a visual check for evidence of intravenous drug use and odor evidence of recent alcohol use will be performed. If you are a female, and of child bearing potential (able to become pregnant), a urine pregnancy test will be done.

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You will be asked to sit in a reclining position during the actual test. The oximeter sensors will be applied to you. The sensors may be lightly clipped or taped onto your fingers, wrists, earlobes, forehead, chest and / or other test sites. [redacted]

In order to test the oximetry device, it will be necessary to adjust the amount of oxygen you are breathing. [redacted] Data is collected continuously throughout the test. You may need a short recovery period at higher oxygen levels in order to complete the test at the lowest oxygen level. If so, the oxygen levels will be adjusted to allow you to recover and then lowered again to try a second attempt at the desired oxygen saturation levels.

In addition to the investigational oximetry device, [redacted] will be used to monitor the oxygen saturation levels in real time throughout the study. This device is used to assess the reliability of the measurements from the investigational oximetry sensor being tested.

A clinical monitoring system will be used during the study to observe your vital signs including ECG tracing, heart rate, respiratory rate, end-tidal CO_2 (carbon dioxide) with capnography (to measure exhaled carbon dioxide levels in your breath) and the oxygen concentration being delivered to you.

[redacted]

[redacted]

You may withdraw from the study at any time. If the gas mixture has been supplied to you, you will be paid whether or not you complete the study. Your participation in the study will be stopped if these feelings from the oxygen desaturation test become very uncomfortable, if your oxygen saturation reaches the minimum allowable level, or for any reason as determined by the study investigator or study staff.

APPROVED BY SALUS IRB: 12 JANUARY 2024

At the end of the test, you will be given oxygen until your oxygen saturation level returns to normal or is elevated. You will be monitored to ensure normal levels are maintained. The recovery period will be approximately 15 minutes. Once you maintain normal levels, you will be released from the study.

Risks and Discomforts

With lower concentrations of oxygen, you may have a faster heart rate, followed by slowing heart rate (vagal response), anxiety, changes in your heart rhythm, sweating, "flushing" (reddening of face) or feeling hot. During the test, you are monitored and asked if you are doing okay. You may feel symptoms such as headache, shortness of breath (air hunger), dizziness / light-headedness, fatigue/ sleepiness, faster breathing, higher pulse rate and tingling in the hands or feet, or confusion. Vision changes such as 'starring' or 'tunnel vision' can also occur. The test will be stopped if your discomfort is severe or the study staff sees signs indicating the test should be stopped. Additionally, the oxygen you breathe is monitored. Note, however, that what is actually a "safe limit" for a particular individual may vary depending upon the individual's particular physiology and medical history. All of these symptoms, if they occur, should reverse within minutes of discontinuation of the testing, although that cannot be guaranteed.

A heating pad or hot water bottles may be used [redacted]. You may experience some mild discomfort if it is too warm. To minimize the discomfort, you will be asked if the heating is too warm and it will be turned on the lowest level possible, removed or additional separation will be used between the heater and the site for comfort.

Occasionally, the sensors are very warm to the touch and may cause some discomfort. The sensors are expected to be warm but not hot enough to burn the site. If this happens during the test, you should tell the study staff during the test and the offending sensor will be removed and later inspected for faulty conditions. The sensor's operating temperature should not cause burns under normal conditions.

The clip-on sensors, wrist and arm straps, exert a minimal amount of pressure on the fingers or earlobes. They should cause you no discomfort. The sensor retention headband for the forehead sensor exerts a minimal amount of pressure and may cause a headache if on for extended periods of time. Adhesive sensors may cause some irritations to the skin in some participants. Typical skin irritations include redness of skin and in some cases allergic reaction. The sensor adhesives may contain natural rubber or latex.

Because this device is investigational, all of its side effects may not be known.

[redacted] for maximum gas delivery. [redacted] Materials may cause some skin irritations.

The adhesive and gel in the ECG pads may cause irritation to the skin. Typical skin irritations include redness of skin and in some cases allergic reaction. Because the adhesive is strong on the ECG pads, it may cause pulling of the skin or hair upon removal.

APPROVED BY SALUS IRB: 12 JANUARY 2024

The reported risks associated with a non-invasive blood pressure (NIBP) cuff measurement include discomfort upon inflation of the cuff, possible bruising, rash (small red or purple spot on the skin, caused by a minor bleed from broken capillary blood vessels), and discoloration of the skin beneath the cuff.

In previous studies, the complications of taking repeated blood pressures were temporary and involved bruising/rash, skin redness/lines, or tingling/discoloration in the arm wearing the cuff while the cuff is inflated.

Reasonable precautions have been taken to minimize foreseeable risks and discomforts. However, this research may involve risks and discomforts to you (or your unborn baby if you are pregnant) which are currently unforeseeable. Women who are pregnant or trying to get pregnant may not participate in the study.

It is very important that you tell the study staff immediately about any side effects to ensure your safety in the study. If you are not honest about your side effects, it may not be safe for you to stay in the study.

New Findings
You will be told about any new findings that may affect your continued participation in a timely manner.

Expected Benefits
There will be no direct benefits to your health. It is our hope that testing like this will lead to the advancement of non-invasive medical monitoring of patients by improving accuracy and performance of pulse oximeters.

Alternatives
Since this study is for research only, the only alternative to this study is to NOT participate.

Costs
There are no anticipated costs to you.

Employees or Family Members of the Study Investigator, Study Staff, or Sponsor
If you are an employee or family member of the study investigator, study staff, or sponsor, the following statements apply:

1. Your decision to participate or not, will not affect your or your family member's performance evaluation at Element.
2. Your decision to participate or not, will not affect your or your family member's opportunity for promotion at Element.
3. Your decision to participate or not, will not affect your or your family member's pay at Element.

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Payment for Participation
You will be paid $150 for this study if you complete the informed consent process and are enrolled into the study, whether or not you complete the study. If you sign the consent form and are excluded for medical reasons you will be paid $50. If you fail to meet the advertised criteria as discussed with you previous to this appointment, you will be dismissed from the study without compensation.

Non-Employee Participants:
Payment will be made at the end of your test on each day of the study.

Employee Participants:
Payment will be made within 3 weeks post the final visit for the study.

Sponsorship / Funding of this Study
Sponsorship / funding of this study is provided by GE HealthCare and given to Element to perform this study on behalf of the sponsor.

HIPAA Authorization to Use and Disclose Information for Research Purposes
Federal regulations give you certain rights related to your health information. These include the right to know who will be able to get the information and why they may be able to get it. The study investigator must get your authorization (permission) to use or give out any health information that might identify you.

What is the role of the sponsor's representative?
GE HealthCare personnel may be present during the study. The role of the GE HealthCare personnel is to give technical support.

What information may be used and given to others?
If you choose to be in this study, the study investigator and study staff will get personal information about you. This may include information that might identify you, including the video recording. The study investigator and study staff may also get information about your health including:

- Basic demographic information
  - Age, sex, ethnic, and racial background
- Medical information provided during the health screen / health questionnaire
- Records made through observations during the study
- Biological samples (e.g. blood, tissues, and analysis results)
- Records made through phone calls as part of this research
- Records about your study visit

Who may use and give out information about you?
Information about your health may be used and given to others by the study investigator, study staff or by GE HealthCare, the sponsor of this study. Your identity will be kept confidential to the extent allowed by the law and will not be made publicly available.

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Clinical Trials - This section ☒ Applies ☐ Does Not Apply

A description of this clinical trial will be available on http://www.ClinicalTrials.gov, as required by U.S. Law. This web site will not include information that can identify you. At most, the web site will include a summary of the results. You can search this web site at any time. This study may not qualify as an Applicable Clinical Trial and information about this trial many not be made publicly available. However, the sponsor may voluntarily register the clinical trial and submit summary results information to the databank. If so, it's possible the results may not be published until after a product is cleared or approved by the FDA.

Who might get this information?

- The U.S. Food and Drug Administration (FDA)
- Department of Health and Human Services (DHHS) agencies
- Governmental agencies in other countries
- Salus Independent Review Board
- The Sponsor, Sponsor Affiliates or Sponsor's representatives

Why will this information be used and/or given to others?

Information about you and your health that might identify you may be given to others to carry out the research study. The representatives from Element or the sponsor will analyze and evaluate the results of the study. In addition, people from the sponsor and its consultants will be visiting the research site to be available for technical support and run the data acquisition system, as needed. They will follow how the study is done, and they will be reviewing your information for this purpose.

The information may be given to the FDA or to Salus IRB. It may also be given to governmental agencies in other countries. This is done so the sponsor can receive marketing approval for a new product resulting from this research. The information may also be used to meet the reporting requirements of governmental agencies.

The results of this research may be published in scientific journals or presented at medical meetings, but your identity will not be disclosed.

The information may be reviewed by an independent review board (IRB). IRB is a group of people who perform independent review of research as required by regulations.

This authorization does not expire.

What if you decide not to give permission to use and give out your health information?

By signing this consent form, you are giving permission to use and give out the health information listed above for the purposes described above. If you refuse to give permission, you will not be able to be in this research.

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Can you review or copy the information obtained from you or created about you?
You have the right to review and copy your health information. However, if you decide to be in this study and sign this permission form, you will not be allowed to look at or copy your information until after the research is completed.

Can you withdraw or revoke (cancel) your permission?
Yes, but this permission will not stop automatically and does not expire.

You may withdraw or take away your permission to use and disclose your health information at any time. You do this by sending written notice to Monica Rabanal, NP. If you withdraw your permission, you will not be able to continue being in this study.

When you withdraw your permission, no new health information which might identify you will be gathered after that date. Information that has already been gathered may still be used and given to others. This would be done if it were necessary for the research to be reliable.

Is your health information protected after it has been given to others?
If you give permission to give your identifiable health information to a person or business, the information may no longer be protected. There is a risk that your information will be released to others without your permission. Every effort will be made to keep your identity confidential.

Compensation for Injury
If you are injured or become ill as a direct result of your participation in this study, contact the study investigator or study staff immediately. Emergency medical treatment will be provided. The cost of this care will be covered by the Sponsor. No other compensation is routinely offered by the study investigator or study staff or sponsor.

Voluntary Participation / Withdrawal
Your participation in this study is voluntary and confidential. You may decide not to participate or you may leave the study at any time. Your decision will not result in any penalty or loss of benefits to which you are entitled.

Your participation in this study may be stopped at any time by the study investigator or study staff without your consent because:

- Your failure to cooperate fully (as determined by the study investigator or study staff) with the required conduct of this study.
- Your development of an illness.
- A determination by an Element representative, for whatever cause, that the study should be discontinued.
- Technical issues with the equipment that prevent adequate collection of the data.

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- A decision was made by the Sponsor, FDA, other government agencies, or Salus IRB to discontinue the study.

Questions
If you have any questions, concerns or complaints about this study or questions about your participation in this study, or if at any time you feel you have experienced a research-related injury, contact the study investigator listed on the first page of this form.

You may contact Salus IRB if you:
- would like to speak with someone unrelated to the research,
- have questions, concerns, or complaints regarding the research study, or
- have questions about your rights as a research participant.

Salus IRB
Phone: 855-300-0815 between 8:00 AM and 5:00 PM Central Time
Email: salus@salusirb.com

If you would like additional information about your rights, research in general, or IRBs, you may visit www.salusirb.com.

It is recommended that you inform your personal physician of your participation in this research study.

You will receive a copy of this signed and dated informed consent and any other written information provided to the participants in this study, if applicable, for your records.

Participant Responsibilities
You are responsible for reporting any concerns or discomforts that occur during the study so they may be addressed, understanding of the procedures or asking the study staff to explain, following instruction given by the study staff and letting the study staff know if you wish to stop your participation in the study.

Photos / video
In this study we will take photographs or video of the sensor application sites prior to and post sensor application for data collection purposes and the Study Sponsor's internal research and development purposes only. This will allow us to analyze the data and observe sensor placement. Shots may be taken of the upper and lower body or any other site where we have placed equipment. The study equipment will be photographed, however, in some circumstances it may be unavoidable to not photograph your face. In order to protect your identity, your name will be kept confidential at all times.

If you refuse to be photographed, it will not affect your ability to participate in the study.

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This consent will remain in effect for as long as it is needed for the Study Sponsor's internal research and development purposes or 10 years, whichever is longer.

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Consent

I have read the information in this consent form. All my questions about the study and my participation in it have been answered. I freely consent to be in this research study and will follow the study investigator and study staff's instructions with the understanding that I may withdraw at any time without penalty of the compensation for participation once enrolled.

I authorize the use and disclosure of my health information to the parties listed in the authorization section of this consent for the purposes described above.

By signing this consent form, I have not given up any of my legal rights.

CONSENT SIGNATURES:

_____
Printed Name of Adult Participant

_____ _____
Signature of Adult Participant Date

_____
Name of Person Conducting Informed Consent Discussion

_____ _____ _____
Signature of Person Conducting Informed Consent Discussion Time Date

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