

PARTNERS HUMAN RESEARCH COMMITTEE PROTOCOL SUMMARY

Answer all questions accurately and completely in order to provide the PHRC with the relevant information to assess the risk-benefit ratio for the study. Do not leave sections blank.

PRINCIPAL/OVERALL INVESTIGATOR

Paolo Bonato, PhD

PROTOCOL TITLE

Upper extremity rehabilitation with the BURT robotic arm: a feasibility study.

FUNDING

Barrett Technology, Inc.

VERSION DATE

October 5, 2018 – Amendment 1

SPECIFIC AIMS

Concisely state the objectives of the study and the hypothesis being tested.

PRIMARY:

- To assess the feasibility of the BURT robotic device to deliver upper extremity training with focus on the system control and error feedback modalities suitable for running long-term interventions. The study will be performed in a small cohort of stroke survivors with impaired upper extremity function.
For example, we would like to assess if the device can be used to achieve the desired range of motion for post-stroke rehabilitation of upper extremity. We would also like to assess if stroke patients are able to follow the instructions provided by the software application and whether the device is easy to use from the therapist's perspective.

SECONDARY:

- Gather usability and design-evaluation feedback sessions with clinical personnel and stroke survivors involved in the study.

BACKGROUND AND SIGNIFICANCE

Provide a brief paragraph summarizing prior experience important for understanding the proposed study and procedures.

Stroke is a leading cause of disability among older adults afflicting nearly 800,000 people each year in the US alone. Roughly half of stroke survivors suffer from chronic hemiparesis. Limited motor recovery in the paretic upper limb accounts for a large proportion of the disabling sequelae. Only about 15% of those with initial complete upper limb paralysis after stroke recover the functional use of their impaired arm in daily life.

Motor training is associated with motor recovery and cortical plasticity. High-intensity, task-specific training leads to greater motor gains than conventional therapy. Virtual reality and robotics are technologies that are suitable to facilitate the implementation of interventions marked by high intensity and task specificity. Recent research has identified several key features of training using a virtual environment that facilitate motor skill reacquisition. These features include high intensity of motor practice, training in stimulating environments thus offering high motivation to the subject, and enhanced feedback (visual and auditory) about the performance of the motor task.

Robotic devices for upper-limb rehabilitation have been shown to improve upper limb function. Transfer of learned movements to functional tasks has been observed in stroke survivors following robot-assisted motor training. Subjects undergoing upper limb robot-assisted rehabilitation generally show larger motor gains than subjects undergoing conventional therapy. The combination of virtual reality and robotics provides clinicians with the means to implement implicit learning paradigms, which have been shown to be particularly effective in rehabilitation.

The overall objective of the proposed study is to carry out usability and design-evaluation assessments of the BURT robotic device for delivering long-term intervention in stroke survivors. The BURT is an upper extremity robotic device that enables the user to see and feel engaging games that encourage intensive therapy. It has 510-K FDA clearance. The device itself provides a significant range of motion designed to match the range of motion in the shoulder joint. The games help motivate the user and can be programmed to become progressively harder as the therapy progresses.

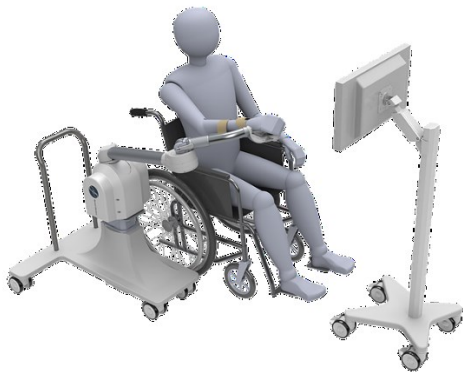


Figure 1 –BURT System (image courtesy of Barrett Medical <http://www.barrettmedical.com/>)

RESEARCH DESIGN AND METHODS

Briefly describe study design and anticipated enrollment, i.e., number of subjects to be enrolled by researchers study-wide and by Partners researchers. Provide a brief summary of the eligibility criteria (for example, age range, gender, medical condition). Include any local site restrictions, for example, “Enrollment at Partners will be limited to adults although the sponsor’s protocol is open to both children and adults.”

We intend to recruit up to 10 stroke survivors over the course of the study. The stroke survivors will participate in a question and answer formatted discussion with research staff to discuss the usability of the device. The clinical personnel involved in the study will participate in a voluntary feedback session to discuss the usability of the device from a clinician’s perspective. We will gather feedback from the clinicians about the device. Due to the voluntary nature of the feedback gathered from clinical personnel, consent will be assumed with participation.

We plan to recruit up to 10 stroke survivors based on the following inclusion/exclusion criteria.

Inclusion Criteria

1. Male and female, age 18-80;
2. Having had a stroke (ischemic or hemorrhagic) at least 6 months prior to study enrollment;
3. Moderate to severe upper-limb motor impairments: score of 15-45 out of 66 on the Fugl-Meyer Scale;
4. Community dwelling;
5. Able to physically fit in the device.

Exclusion Criteria

1. Current participation in rehabilitation program targeting upper extremity function;

2. Cognitive impairment resulting to inability to follow instructions (MMSE \geq 23 and subject is able to follow the 3-Stage Command) or inability to sustain attention for more than 10 minutes;
3. Visual impairments as assessed by the NIH Stroke Scale Visual Field subscale (only subjects with no visual loss will participate in the study);
4. Aphasia sufficient to limit comprehension and completion of the treatment protocol;
5. No more than moderate impairments in paretic UE sensation, passive range of motion, and pain that would limit ability to engage in therapy;
6. Increased muscle tone as indicated by score of \geq 3 on the Modified Ashworth Scale;
7. Previous diagnosis of neurological diseases other than stroke;
8. Other conditions affecting function of the stroke affected upper limb;
9. Individuals who present with the following:
 - open wounds
 - fragile skin
 - active infection

Briefly describe study procedures. Include any local site restrictions, for example, “Subjects enrolled at Partners will not participate in the pharmacokinetic portion of the study.” Describe study endpoints.

Data will be obtained from multiple sources: **(1)** Interviews of subjects, to obtain demographic information, medical history, and responses to clinical assessments. **(2)** Clinical examination using standard assessment tools. **(3)** Feedback surveys that will be filled out by study volunteers to provide the R&D team with feedback concerning the design of the BURT robotic system. **(4)** Data collected by sensors embedded in the robotic system.

All activities will take place at the Motion Analysis Laboratory (MAL). The study involves up to 21 visits in total within a 7 week period. The total duration may vary within this 7 week period to accommodate missed study visits.

- Visit number 1:

Potential subjects who are deemed eligible during initial contact (usually by phone) will be invited to attend an in-person screening to ensure that all inclusion and exclusion criteria are met. The first session will consist of consent and screening of the subject. The procedure will start with the Mini-Mental State Examination (MMSE) for the assessment of an individual's ability to follow instructions sufficiently for the successful completion of study protocol. If the MMSE score is less than 23, the subject will be excluded from the study and the procedure will stop.

Since it is relatively common for people to have impaired decision-making capability after a stroke, prospective study volunteers' decision-making capacity and ability to give consent will be assessed using the University of California at San Diego Brief Assessment of Consent Capacity (UBACC) Questionnaire. If the subject demonstrates that he/she is able to understand the study procedures and provide consent, we will proceed to obtain informed consent. In the event that a potential subject fails the UBACC, they will be excluded from the study.

Informed consent will be obtained by study staff members who have completed the Partners Healthcare System's human subject protection educational requirements, and the CITI Program in Protection of Human Subjects, in compliance with all Federal regulations regarding such training. Prospective subjects will be interviewed to determine preliminary eligibility. Informed consent will be obtained and subjects will be enrolled in the study prior to any clinical or laboratory testing. Subjects will be given a copy of the IRB approved consent form during the initial interview, and study staff will explain in detail the nature of the informed consent process, study purpose and procedures, time commitments, risks, potential benefits, treatment alternatives, rights as research participants, study staff contact information, confidentiality

procedures, and arrangements for medical care provided in case of injury during the study. Participants will be provided with a signed copy of the completed consent form.

- Visit number 2:

Baseline outcomes assessment battery. The clinical assessment session will last approximately 1 ½ to 2 hours. A battery of standardized measures for upper extremity in stroke rehabilitation will be administered. The battery will include: (1) range of motion and muscle strength assessment, (2) spasticity evaluation with the Modified Ashworth Scale, (3) Fugl-Meyer Assessment of upper extremity including pain and sensation subtests, (4) Wolf Motor Function Test and (5) the Motor Activity Log. All are reliable and valid measures of upper extremity motor capacity and function. We will also use the Goal Attainment Scaling to identify specific goals to focus on during the intervention. The Fugl-Meyer is our primary outcome measure and the Goal Attainment Scale our secondary outcome measure. The remaining outcome measures will be exploratory.

- Visit number 3-20:

Intervention. Participants will receive robot-assisted upper extremity research therapy using the BURT (figure 1, page 1). The BURT provides position-controlled exercises during computerized games that emphasize repetitive movements of the paretic upper extremity. Rest periods will be offered between games, as needed. During the first treatment session, the BURT will be adjusted for the participant's arm size and the workspace will be measured via standard procedures. Subjects will be instructed to perform a series of motor tasks using the BURT system. All tasks will be performed in a seated position. Arm movements will be remapped into a virtual environment and displayed on a computer screen to enable feedback. The motor tasks to be performed by subjects will consist of arm movements aimed at performing an "activity" in the virtual environment (e.g. picking up a box, scrubbing a surface, drawing simple geometric shapes, ...). The interaction between the subject and the BURT system will be set using either cooperative or competitive control strategies. Augmented feedback modalities (i.e. the application of gains to "magnify" aspects of the display of error-related information) will be tested. Also, the selected set of games will allow us to test different feedback modalities (e.g. visual and auditory cues) and different control modalities. Task challenge for each training device will be incrementally increased or decreased based on participant performance.

All participants will receive 1 hour sessions, 2-3x/week for 6 weeks (total 18 sessions). Sessions will be organized with 30 minutes of robotic-assisted training and 30 minutes of hands-on training with a research therapist to work on the baseline goals of the subject. Hands-on training will be done with routinely employed techniques in therapy to transfer the skills gained with the robotic device in everyday life activities.

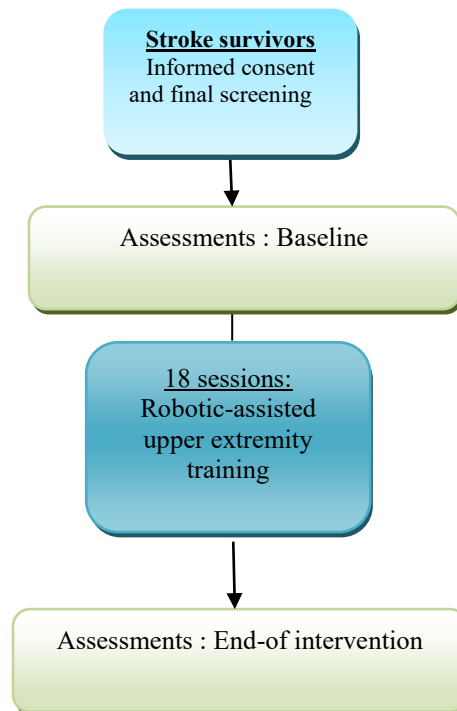
Participants may miss up to 3 appointments, and we will reschedule the following day or week at a time that is mutually convenient. Participants who miss 4 consecutive appointments may be removed from the study.

- Visit number 21:

End-of-intervention outcomes assessment battery. We will repeat the same battery as performed in study visit number 2. Additionally, we will gather qualitative feedback under the form of a questionnaire in regard to the usability and the design characteristics of the device (the same questionnaire will be to study volunteers and study staff with clinical expertise (e.g. therapists and physiatrists)). The content of the questionnaires will be focused on aspects of the BURT system design such as the following: the ease of setting up the system; the comfort level achieved by the design of the human-robot interface; the effectiveness of the visual display of error feedback; the intuitiveness of the haptic feedback; the types of therapeutic exercises enabled by the system; the clarity of the instructions provided to guide the performance of

exercises. Feedback will be gathered using a visual analogue scale. We will also take note of any other comments study participants and study staff with clinical expertise might have. Study staff will guide the subject thru the questionnaire and be readily available to answer any question.

Schema 1: study procedures flow



For studies involving treatment or diagnosis, provide information about standard of care at Partners (e.g., BWH, MGH) and indicate how the study procedures differ from standard care. Provide information on available alternative treatments, procedures, or methods of diagnosis.

Standard of care for individuals with chronic motor impairments >6 months' post stroke does not typically involve upper extremity rehabilitation. However, individuals with stroke may at times be involved in standard occupational therapy intervention to address upper extremity motor impairments and optimize functioning during basic activities of daily living (ADL) and instrumental ADLs (e.g. cooking, shopping etc.). The study interventions differ from standard care in that robot training activities provide a much higher number of movement repetitions than is possible during conventional rehabilitation practice.

Describe how risks to subjects are minimized, for example, by using procedures which are consistent with sound research design and which do not unnecessarily expose subjects to risk or by using procedures already being performed on the subject for diagnostic or treatment purposes.

Clinical testing will be conducted under the direct and continuous supervision of trained study staff. Subjects will be asked to report all activity-related symptoms of pain or discomfort to the study staff. Research staff/therapists will evaluate pain and report to the PI or site responsible investigator who will make the decision to seek medical advice and care. Subjects will be

supervised, guarded and as necessary, and assisted as needed throughout the study sessions. To prevent excessive fatigue, subjects will be encouraged to take breaks as needed throughout all study procedures. Videos of the session will be stored in locked cabinets and on password protected encrypted computer that only study staff within the Motion Analysis Laboratory have access to.

Describe explicitly the methods for ensuring the safety of subjects. Provide objective criteria for removing a subject from the study, for example, objective criteria for worsening disease/lack of improvement and/or unacceptable adverse events. The inclusion of objective drop criteria is especially important in studies designed with placebo control groups.

Subjects will be screened prior to and during enrollment for contraindications to their participation. The clinical tests used in this study are standard instruments associated with minimal risks, and will be administered by a research therapist experienced in working with this patient population. Clinical evaluations administered prior to the study procedures will be used to help identify impairments that may impact safe participation in BURT use.

Research staff in Dr. Bonato's Motion Analysis Laboratory have extensive experience with the measurement tools (e.g. motion capture, wearable sensors) and intervention devices similar to the one used in this study, and have maintained excellent safety records at SRH and at institutions outside the Partners network. The BURT is an actuated (powered) robot capable of independent motion. This device has many built in safety features including a system controller designed to avoid excessively fast movements of the upper extremity, safety limits set for the estimated interaction forces during arm motions, and two emergency switches to immediately shut off robot power in the event of a malfunction. Subjects will be closely supervised during all assessment and therapy sessions to ensure safety.

The criteria for continued participation and participant removal from the study are as follows: we will allow participants to miss up to 3 appointments and will reschedule the following day or week at a time that is mutually convenient. We will remove participants from the study after 4 consecutive missed appointments.

In case in which a subject experiences discomfort they will be free to remove the system and end their participation in the study.

Videos of the sessions will be locked in cabinets and on password protected encrypted computers.

FORESEEABLE RISKS AND DISCOMFORTS

Provide a brief description of any foreseeable risks and discomforts to subjects. Include those related to drugs/devices/procedures being studied and/or administered/performed solely for research purposes. In addition, include psychosocial risks, and risks related to privacy and confidentiality. When applicable, describe risks to a developing fetus or nursing infant.

- The BURT is equipped with actuated components (i.e. motors) capable of independent motion. Risks are minimal when the BURT is used according to instructions. Small injuries, such as bruising or stretching can occur in rare cases, however, numerous safety features and procedures have been implemented to minimize risk of injury. These include a system controller designed to avoid excessively fast movements of the upper extremity joints; safety limits set for the estimated interaction forces during arm motions, and two emergency switches to immediately shut off robot power in the event of a malfunction. Height adjustments of the BURT will be performed with caution so injury does not occur when

lowering the device to ensure proper positioning for therapy. The straps of the device may cause redness of the skin. We will assure proper upper limb positioning during intervention and will pad the straps as needed so they are comfortable for the subject. Performing the tasks may cause muscle soreness similar to the potential soreness from normal daily activities.

- Being videotaped poses a privacy risk. These videos could be seen by people outside of the study staff who may be able to recognize your face. We will lock these videos in cabinets and on password protected encrypted computers that only study staff associated with the study can access.

EXPECTED BENEFITS

Describe both the expected benefits to individual subjects participating in the research and the importance of the knowledge that may reasonably be expected to result from the study. Provide a brief, realistic summary of potential benefits to subjects, for example, "It is hoped that the treatment will result in a partial reduction in tumor size in at least 25% of the enrolled subjects." Indicate how the results of the study will benefit future patients with the disease/condition being studied and/or society, e.g., through increased knowledge of human physiology or behavior, improved safety, or technological advances.

Subjects may or may not benefit from this study. It is hoped that the data derived from this study will help shape the future of upper extremity stroke rehabilitation. Potential benefits of robot-assisted therapy for the paretic arm after stroke may include at least short term reductions of motor impairment. We hope that more than 25% of participants will be able to benefit from the robot-assisted therapy and will demonstrate improved functional use of the paretic upper extremity. This is a usability study so if successful in delivering long term intervention, the BURT has the potential to complement the current robotic systems available for upper extremity rehabilitation.

EQUITABLE SELECTION OF SUBJECTS

The risks and benefits of the research must be fairly distributed among the populations that stand to benefit from it. No group of persons, for example, men, women, pregnant women, children, and minorities, should be categorically excluded from the research without a good scientific or ethical reason to do so. Please provide the basis for concluding that the study population is representative of the population that stands to potentially benefit from this research.

No children will be enrolled due to confounding effects of brain development on stroke recovery. Pregnant women will be excluded from the study to ensure no risks to the fetus. Since the BURT has the ability to retract to the body, there is a risk of the robot making contact with the stomach of a user. No person will be excluded from participation in this study on the basis of gender, ethnic, or racial group.

When people who do not speak English are excluded from participation in the research, provide the scientific rationale for doing so. Individuals who do not speak English should not be denied participation in research simply because it is inconvenient to translate the consent form in different languages and to have an interpreter present.

Non-English speaking subjects will not be excluded from the study. Every effort will be made by the investigators to assist potential non-English speaking subjects to fully participate in the study by having the consent form translated into the appropriate language and having an interpreter available, if needed.

For guidance, refer to the following Partners policy:

Obtaining and Documenting Informed Consent of Subjects who do not Speak English

[https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Non-English Speaking Subjects.1.10.pdf](https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Non-English%20Speaking%20Subjects.1.10.pdf)

RECRUITMENT PROCEDURES

Explain in detail the specific methodology that will be used to recruit subjects. Specifically address how, when, where and by whom subjects will be identified and approached about participation. Include any specific recruitment methods used to enhance recruitment of women and minorities.

Prospective study volunteers will be identified using the following sources:

- Flyers and posters posted in the outpatient clinics and therapy gyms and in public spaces inside and outside of the hospital.
- Stroke survivors who previously agreed to be contacted about opportunities to participate in research studies at SRH may be contacted by phone by a study staff.
- The Partners RSVP for health website.
- Contact and presentation at community centers, conferences and support groups.
- Contact to the patients listed in the Partners Research Patient Data Registry (RPDR).
- Attending physicians and therapists may refer their stroke inpatients/outpatients to the study. We will provide the physicians with study flyers.

Subjects eligible to participate in the study will contact or give permission to be contacted by study staff to obtain more information about the study and give informed consent.

Provide details of remuneration, when applicable. Even when subjects may derive medical benefit from participation, it is often the case that extra hospital visits, meals at the hospital, parking fees or other inconveniences will result in additional out-of-pocket expenses related to study participation. Investigators may wish to consider providing reimbursement for such expenses when funding is available

Subjects will be compensated based on the procedures undertaken. The amount of compensation will be as follows:

- Assessment/evaluation sessions: \$50 each (up to 2)
- Training sessions with the BURT: \$5 each (up to 18)

Each subject will receive up to \$190 in for completing the whole study. Additionally, we will cover the cost of parking at SRH for all the visits.

For guidance, refer to the following Partners policies:

Recruitment of Research Subjects

[https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Recruitment Of Research Subjects.pdf](https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Recruitment%20Of%20Research%20Subjects.pdf)

Guidelines for Advertisements for Recruiting Subjects
[https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Guidelines For Advertisements.1.11.pdf](https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Guidelines%20For%20Advertisements.1.11.pdf)

Remuneration for Research Subjects
[https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Remuneration for Research Subjects.pdf](https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Remuneration%20for%20Research%20Subjects.pdf)

CONSENT PROCEDURES

Explain in detail how, when, where, and by whom consent is obtained, and the timing of consent (i.e., how long subjects will be given to consider participation). For most studies involving more than minimal risk and all studies involving investigational drugs/devices, a licensed physician investigator must obtain informed consent. When subjects are to be enrolled from among the investigators' own patients, describe how the potential for coercion will be avoided.

At the first point of contact (usually a phone call), study staff will administer a phone screening questionnaire. Phone screening questionnaires will not contain identifiable information unless the subject is eligible and agrees to attend the first visit to give informed consent. Subjects will be given the option to attend the screening in person. The procedure will start with the Mini-Mental State Examination (MMSE) for the assessment of an individual's ability to follow instructions sufficiently for the successful completion of study protocol. If the MMSE score is less than 23, the subject will be excluded from the study and the procedure will stop.

Since it is relatively common for people to have impaired decision-making capability after a stroke, prospective study volunteers' decision-making capacity and ability to give consent will be assessed using the University of California at San Diego Brief Assessment of Consent Capacity (UBACC) Questionnaire. If the subject demonstrates that he/she is able to understand the study procedures and provide consent, we will proceed to obtain informed consent. In the event that a potential subject fails the UBACC and a surrogate is not present, we will ask the subject's permission to contact a surrogate over the phone. The consenting process will be stopped until both, subject and surrogate, are present. We will contact the surrogate, ask if they would be willing to come to the laboratory with the subject and make an appointment if they agree. We will go over the consent form in detail with the surrogate and provide them sufficient time to go over the study, ask questions and make an informed decision.

Study staff members (either the PI or a non-clinician investigator not involved in the patient's care) who have completed the human subject protection educational requirements, and the CITI Program in Protection of Human Subjects, in compliance with all Federal regulations regarding such training, will obtain informed consent in the Motion Analysis Laboratory (MAL) at SRH. The test procedures will be described to the subject. Study staff will clearly explain all the procedures and risks of the testing outlined in the informed consent form (ICF). The subject will be told that the informed consent also asks for permission to view information in their medical records (for instance images) to gain a better understanding of the characteristics of their stroke (e.g. site and severity of their stroke). They will also be told that the investigators will limit their review to already existing head CT and MRI images and reports already contained in the Electronic Medical Record system. The subject will be given adequate time to consider their decision to participate in the study and encouraged to ask questions, both during the initial interview and throughout the study. A member of the study staff will answer any questions regarding the study

at the time consent is given. Once enrolled, the subject may pause or terminate his/her participation at any time during the study.

The subject must demonstrate to study staff obtaining the consent, an understanding of the study, that it is research and not treatment, and the risks and benefits involved in the procedures.

NOTE: When subjects are unable to give consent due to age (minors) or impaired decision-making capacity, complete the forms for Research Involving Children as Subjects of Research and/or Research Involving Individuals with Impaired Decision-making Capacity, available on the New Submissions page on the PHRC website:

<https://partnershealthcare.sharepoint.com/sites/phrmApply/aieipa/irb>

For guidance, refer to the following Partners policy:

Informed Consent of Research Subjects:

https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Informed_Consent_of_Research_Subjects.pdf

DATA AND SAFETY MONITORING

Describe the plan for monitoring the data to ensure the safety of subjects. The plan should include a brief description of (1) the safety and/or efficacy data that will be reviewed; (2) the planned frequency of review; and (3) who will be responsible for this review and for determining whether the research should be altered or stopped. Include a brief description of any stopping rules for the study, when appropriate. Depending upon the risk, size and complexity of the study, the investigator, an expert group, an independent Data and Safety Monitoring Board (DSMB) or others might be assigned primary responsibility for this monitoring activity.

NOTE: Regardless of data and safety monitoring plans by the sponsor or others, the principal investigator is ultimately responsible for protecting the rights, safety, and welfare of subjects under his/her care.

Approval of protocol, informed consent procedures, and recruitment will be obtained from the IRB during annual reviews. Because this study's procedures pose relatively low risk to subjects, monthly data and procedural reviews by the PI (Dr. Bonato) in consultation with study staff will be sufficient to identify and ameliorate any potential safety issues. However, any safety concerns about the equipment or clinical protocol will be brought to the attention of the PI, Dr. Bonato at the time they occur, and immediate action will be taken. Dr. Bonato will be responsible for determining whether the research should be altered or stopped in the event that participant safety is at risk.

Describe the plan to be followed by the Principal Investigator/study staff for review of adverse events experienced by subjects under his/her care, and when applicable, for review of sponsor safety reports and DSMB reports. Describe the plan for reporting adverse events to the sponsor and the Partners' IRB and, when applicable, for submitting sponsor safety reports and DSMB reports to the Partners' IRBs. When the investigator is also the sponsor of the IND/IDE, include

the plan for reporting of adverse events to the FDA and, when applicable, to investigators at other sites.

NOTE: In addition to the adverse event reporting requirements of the sponsor, the principal investigator must follow the Partners Human Research Committee guidelines for Adverse Event Reporting

Study staff will report any adverse event within 24 hours to the PI, and any serious adverse event also will be reported immediately to Dr. Bonato. A written report will be submitted to the IRB within 48 hours. Remedial action to prevent reoccurrence of the event will be instituted prior to resumption of study procedures. Compliance with regulatory standards for study documentation will be closely monitored by the PI.

MONITORING AND QUALITY ASSURANCE

Describe the plan to be followed by the principal investigator/study staff to monitor and assure the validity and integrity of the data and adherence to the IRB-approved protocol. Specify who will be responsible for monitoring, and the planned frequency of monitoring. For example, specify who will review the accuracy and completeness of case report form entries, source documents, and informed consent.

NOTE: Regardless of monitoring plans by the sponsor or others, the principal investigator is ultimately responsible for ensuring that the study is conducted at his/her investigative site in accordance with the IRB-approved protocol, and applicable regulations and requirements of the IRB.

Study staff will conduct quarterly audits to ensure compliance with regulatory standards to assure the integrity of study documentation and adherence to the IRB-approved protocol. Specifically, the accuracy and completeness of case report forms, source documents and informed consent forms will be audited by study staff under direct supervision of the PI (Dr. Bonato).

For guidance, refer to the following Partners policies:

Data and Safety Monitoring Plans and Quality Assurance

[https://partnershealthcare-public.sharepoint.com/ClinicalResearch/DSMP in Human Subjects Research.pdf](https://partnershealthcare-public.sharepoint.com/ClinicalResearch/DSMP%20in%20Human%20Subjects%20Research.pdf)

Reporting Unanticipated Problems (including Adverse Events)

[https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Reporting Unanticipated Problems including Adverse Events.pdf](https://partnershealthcare-public.sharepoint.com/ClinicalResearch/Reporting%20Unanticipated%20Problems%20including%20Adverse%20Events.pdf)

PRIVACY AND CONFIDENTIALITY

Describe methods used to protect the privacy of subjects and maintain confidentiality of data collected. This typically includes such practices as substituting codes for names and/or medical record numbers; removing face sheets or other identifiers from completed surveys/questionnaires; proper disposal of printed computer data; limited access to study data; use of password-protected computer databases; training for research staff on the importance of confidentiality of data, and storing research records in a secure location.

NOTE: Additional measures, such as obtaining a Certificate of Confidentiality, should be considered and are strongly encouraged when the research involves the collection of sensitive data, such as sexual, criminal or illegal behaviors.

Subjects will be assigned a study number, which will be used for all documentation, except for master lists (electronic and paper) matching subjects' names and study numbers and intake interview forms. The master list and interview forms will be kept in a secure location in locked offices at SRH. No non-study staff will have access to any identifiable patient study data or demographic information. All participants will be informed of their privacy rights and sign a HIPAA-compliant authorization form previously approved by the Spaulding IRB.

Subject's face will be covered from the videos of their face was included in the footage. We will destroy the videotapes/photos after 7 years from the date we close the study. This is the policy of Partners Healthcare System.

No personally identifiable data will be sent to or viewed by collaborators outside of SRH. Only co-investigators and study staff will have access to the data from the study. Study data will be maintained on computers with password-codes accessible only to study staff, and hard data will be kept in locked cabinets and offices at SRH.

SENDING SPECIMENS/DATA TO RESEARCH COLLABORATORS OUTSIDE PARTNERS

Specimens or data collected by Partners investigators will be sent to research collaborators outside Partners, indicate to whom specimens/data will be sent, what information will be sent, and whether the specimens/data will contain identifiers that could be used by the outside collaborators to link the specimens/data to individual subjects.

Only de-identified data will be shared with collaborators at Barrett Technology, Inc.

Specifically address whether specimens/data will be stored at collaborating sites outside Partners for future use not described in the protocol. Include whether subjects can withdraw their specimens/data, and how they would do so. When appropriate, submit documentation of IRB approval from the recipient institution.

N/A

RECEIVING SPECIMENS/DATA FROM RESEARCH COLLABORATORS OUTSIDE PARTNERS

When specimens or data collected by research collaborators outside Partners will be sent to Partners investigators, indicate from where the specimens/data will be obtained and whether the specimens/data will contain identifiers that could be used by Partners investigators to link the specimens/data to individual subjects. When appropriate, submit documentation of IRB approval and a copy of the IRB-approved consent form from the institution where the specimens/data were collected.

N/A