

Official Title: Adaptive Ankle Robot Control System to Reduce Foot-drop in Chronic Stroke

NCT02483676

Date: 5.27.2015

Approved Study Protocol



Date: 5/27/2015, 2:46:49 PM
View: v2_Introduction Page

Print Close

Introduction Page

- 1 * **Abbreviated Title:**
Ankle robotics for foot-drop in stroke
- 2 * **Full Title:**
Adaptive ankle robot control system to reduce foot-drop in chronic stroke
- 3 * **Select Type of Submission:**
IRB Application
- 4 **Original Version #:**

ID: VIEW4DF8709A33C00
Name: v2_Introduction Page

View: v2_Research Team Information

Research Team Information

- 1 * **Principal Investigator - Who is the PI for this study (person must have faculty status)? *Faculty status is defined as being a full-time (>51% effort) faculty member holding one of the following titles at UM: Professor; Associate Professor; Assistant Professor.***
Larry Forrester
- 1.1 * **Does the Principal Investigator have a financial interest related to this research?**
 Yes No
- 2 **Point of Contact - Who is the alternative point of contact for the PI? This person can be a study coordinator or any other study team member. In case the IRB cannot contact the PI, this person is a secondary person to contact:**
Robert Asbury
- 2.1 **Does the Point of Contact have a financial interest related to this research?**
 Yes No
- 3 **Other Team Members - list all additional members of the research team for this study. DO NOT include the PI or POC in this list:**

Name	Edit Submission	cc on Email	Research Role	Has SFI?
Susan Conroy	yes	yes	Sub-Investigator	no
Laurence Magder	no	no	Sub-Investigator	no
Kate Flores	no	no	Research Team Member	no
Richard Macko	yes	yes	Sub-Investigator	no
Jason Diaz	yes	yes	Research Team Member	no
Anindo Roy	yes	yes	Sub-Investigator	no
Charlene Hafer-Macko	yes	yes	Sub-Investigator	no

IMPORTANT NOTE: All research team members (including PI) must have current CITI and HIPAA training completed.

ID: VIEW4DF85C16F2800
Name: v2_Research Team Information

View: v2_Resources

Resources

- 1 * **Describe the time that the Principal Investigator will devote to conducting and completing the research:**
50% effort
- 2 * **Describe the facilities where research procedures are conducted:**
All training and testing and will be conducted at the Human Motor Performance Laboratory which is located in the Baltimore VA Annex on 209 W. Fayette St and/or the new Baltimore VA Loch Raven exercise and robotics center at 3901 The Alameda, Baltimore. All medical screening procedures including physical exams, medical histories, and screening treadmill tests will be conducted in the Geriatric Assessment Clinic at the Baltimore VA Medical Center or in the clinical facilities at the Loch Raven location.
- 3 * **Describe the availability of medical and/or psychological resources that subjects might need as a result of anticipated consequences of the human research:**
All exercise testing and training will be conducted by exercise physiologists and research assistants who are trained in CPR and exercise training. Clinical providers are on-call and available for consult if a medical issue arises. An AED is available on-site and if any unanticipated medical emergencies arise study staff will call 911 for emergency care. If 911 is activated, participants will be taken to the nearest available hospital for care.
- 4 * **Describe the process to ensure that all persons assisting with the research are adequately informed about the protocol, the research procedures, and their duties and functions:**

Prior to assisting with research procedures all study personnel will complete CITI, HIPAA, VA research policy training, and any other training as required. All study personnel will also be trained on how to properly conduct study procedures. Once each staff member has completed training and successfully demonstrated their ability to conduct each procedure, the Principal Investigator or Laboratory Manager will sign off on the Training Signature Log that training is completed.

ID: VIEW4DF83CB976400
Name: v2_Resources

View: v2_Sites Where Research Activities Will Be Conducted

Sites Where Research Activities Will Be Conducted

- 1 * Is this study a:
 - Single Site
 - Multi-Site
- 2 * Are you relying on an external IRB (not UM) to be the IRB of Record for this study?
 - Yes No
- 3 * Are any other institutions/organizations relying on UM to be the IRB of Record for this study?
 - Yes No
- 3.1 Attach the applicable regulatory documents here (i.e., IRB Authorization Agreement (IAA), FWA, local ethics approval, other IRB approvals, etc.). Final UM approval will be contingent upon final execution of all required regulatory approvals:

Name	Created	Modified Date
There are no items to display		
- 4 * Is UM the Coordinating Center for this study? (Applicable for multi-site studies. A Coordinating Center is responsible for overall data management, monitoring and communication among all sites, and general oversight of conduct of the project.)
 - Yes No
- 5 * Institution(s) where the research activities will be performed:
 - VAMHCS
 - Other Sites

ID: VIEW4DF870DF2C000
Name: v2_Sites Where Research Activities Will Be Conducted

View: v2_Other Sites Where Research Activities Will Be Conducted

Other Sites Where Research Activities Will Be Conducted

You selected "Other Sites," "Private Practice," "Community Mental Health Centers," and/or "Nursing Homes in Maryland" as a site where research will be conducted.

- 3.1 * Specify the name of the site(s):
Baltimore VA Medical Center Annex (206 W Fayette Street); Baltimore VA Loch Raven Exercise and Robotics Facility (3901 The Alameda,)
- 3.2 * Contact Person(s) for Other Site:
Anindo Roy, PhD; Robert Asbury
- 3.3 * Phone (if no phone available, input "none"):
410-637-3234; [410-605-3735](tel:410-605-3735)
- 3.4 * Email Address (if no email available, input "none"):
aroy@som.umaryland.edu; robert.asbury@va.gov

ID: VIEW4DF85DF452400
Name: v2_Other Sites Where Research Activities Will Be Conducted

View: v2_Funding Information

Funding Information

- 1 * Indicate who is funding the study:
Federal
- 2 * What portion of the research is being funded? (Choose all that apply)
 - Staff
 - Participant Compensation
 - Procedures
- 3 Please discuss any additional information regarding funding below:
This VA-funded grant primarily supports the effort of the PI and Co-Investigators, research staff, and supplies. It also provides a small stipend to participants.

ID: VIEW4DF85DF452400
Name: v2_Funding Information

View: v2_DHHS Funded Study

DHHS Funded Study

You indicated that this is a Federally funded study.

1 * Is this study sponsored by a Department of Health and Human Services (DHHS) agency?

Yes No

2 If Yes, indicate the grant number(s):

- OR - Check here if the grant is not assigned a number.

3 If Yes, upload all grant documents:

Name	Created	Modified Date
There are no items to display		

ID: VIEW4DF87B960800
Name: v2_DHHS Funded Study

View: v2_Federal Agency Sponsor Information

Federal Agency Sponsor Contact Information

You indicated that this is a Federally funded study.

1 * Agency Name:

Veterans Affairs Rehabilitation Research & Development

* Address 1:

Veterans Affairs (122P)

Address 2:

810 Vermont Avenue

* City:

Washington

* State:

DC

* Zip Code:

20420

* Contact Person:

Dr. Patricia Dom

* Phone Number:

[202.254.0261](tel:202.254.0261)

Grant Number 1 (if applicable):

1I01RX001699-01A1- OR - Check here if Grant 1 is not assigned a number.

If Grant 1 has no number, please provide the following information:

Title of Grant 1:

PI of Grant 1:

Grant Number 2 (if applicable):

- OR - Check here if Grant 2 is not assigned a number.

If Grant 2 has no number, please provide the following information:

Title of Grant 2:

PI of Grant 2:

Grant Number 3 (if applicable):

- OR - Check here if Grant 3 is not assigned a number

If Grant 3 has no number, please provide the following information:

Title of Grant 3:

PI of Grant 3:

Grant Number 4 (if applicable):

- OR - Check here if Grant 4 is not assigned a number.

If Grant 4 has no number, please provide the following information:

Title of Grant 4:

PI of Grant 4:

ID: VIEW4DF8584874400
Name: v2_Federal Agency Sponsor Information

View: v2_Research Protocol

Research Protocol

- 1 * Do you have a research protocol to upload?
No, I do not have a research protocol and will use the CICERO application to enter my study information
- 2 If Yes, upload the research protocol:
Name Created Modified Date
There are no items to display

ID: VIEW4E00563F8D000
Name: v2_Research Protocol

View: v2_Risk Level

Risk Level

What is the risk level of your study? (Ultimately, the IRB will determine the appropriate risk level and your designation is subject to change.)

- * Choose One:
Greater Than Minimal - Does not meet the definition of Minimal Risk.

ID: VIEW4E02805225800
Name: v2_Risk Level

View: v2_Type of Research

Type of Research

- 1 * Indicate **ALL** of the types of research procedures involved in this study (Choose all that apply):
Evaluation of device(s) for safety or effectiveness or use of a HUD.
Psychological/Behavioral/Educational Method or Procedure (i.e., survey, questionnaires, interviews, focus groups, educational tests).
Data Collection or Record Review (i.e., chart review, datasets, secondary data analysis).
- 2 * Is this study a clinical trial?
A clinical trial is a biomedical or behavioral research study of human subjects designed to answer specific questions about therapeutic interventions (drugs, treatments, or devices). Clinical trials are used to determine whether new therapeutic interventions are safe, efficacious, and effective.
 Yes No

ID: VIEW4E0280569E000
Name: v2_Type of Research

View: v2_Lay Summary

Lay Summary

- 1 * Provide a summary of the background and purpose of the study in language that can be understood by a person without a medical degree.
This proposal investigates an adaptive control approach that allows a novel ankle robot (anklebot) to be used with treadmill training to reduce foot drop and improve walking in chronic stroke survivors. Currently, stroke survivors with foot drop are trained to live with a cane or other assistive device, and often ankle-foot braces (AFO's) for safety. Neither of these solutions allows patients to practice with their affected ankle during walking to promote recovery. Our approach uses information about how patients are walking from step-to-step, and over weeks, to inform the robot if and when robotic assistance is needed. This allows the patient to gradually re-learn how to use the ankle in the actual act of walking, compared to performing separate therapy exercises that may not be as helpful in recovery, or walking alone without robotic help.

The aims of the study are to compare effectiveness of 6 weeks treadmill walking with the anklebot vs. the same amount of walking on a treadmill without robotic assistance. The hypothesis is that treadmill + anklebot will improve walking more than treadmill alone as measured by: by greater increases in gait velocity, better ankle lifting when stepping forward, higher push-off forces at the affected leg, and greater increases in the amount of walking at home. It is also expected that the anklebot + treadmill group will have greater improvements in balance as measured by: reduced postural sway, reduced uneven loading between the legs in quiet standing, and gains in clinical balance scales. Finally it is predicted that the above gains will be better retained by the anklebot group at 6 weeks and again at 6 months after training cessation.

ID: VIEW4E02805CF7000
Name: v2_Lay Summary

View: v2_Justification, Objective, & Research Design

Justification, Objective, & Research Design

If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer boxes below.

- 1 * Describe the purpose, specific aims, or objectives of this research. State the hypothesis to be tested:
This proposal investigates a novel ankle robot (anklebot) adaptive control approach integrated with treadmill training to reduce foot drop and improve mobility function in chronic hemiparetic stroke survivors. Currently, stroke survivors with foot drop are trained to live with a cane or other assistive device, and often ankle foot orthotics (AFO's) for safety. Neither mediates task-practice or neuromotor recovery.

We have developed an adaptive anklebot controller that detects gait cycle sub-events for precise timing of graded robotics assist to enable deficit severity adjusted ankle motor learning in the context of walking. Our Merit pilot findings show that 6 weeks treadmill training with robot (TMR) timed to assist swing phase dorsiflexion only, is more effective than TM alone to improve free-walking swing dorsiflexion at foot strike (+400%, +9.7°, N=4/group), floor-walking speed (21% vs. 9%), and the benefits are retained at 6 weeks post-training such that 3 of 4 participants no longer required their AFO's. Notably, swing-phase TMR training improved paretic leg push-off (277% vs. 2%), and center-of-pressure (CoP) sway on standing balance (-25% vs. +30%), indicating generalized benefits to other elements of gait and balance, beyond those robotically targeted toward foot drop.

This randomized study investigates the hypothesis that 6 weeks TMR is more effective to durably improve gait biomechanics, static and dynamic balance, and mobility function in chronic stroke survivors with dorsiflexion deficits, compared to TM alone. Aims are to determine the comparative effectiveness of 6 weeks TMR vs. TM alone on:

- 1) Independent gait function indexed by gait velocity, swing-phase DF, terminal stance push off, and 48-hour free-living mobility profiles.
- 2) Balance function indexed by measures of postural sway (CoP), asymmetric loading in quiet standing, peak paretic A-P forces in non-paretic gait initiation, and standardized scales (Berg Balance, Dynamic Gait Index, and ABC for Falls Efficacy) and;
- 3) Long-term mobility outcomes, assessed by repeated measures of all key gait and balance outcomes at 6 weeks and 6 months after formal training cessation.

While upper extremity robotics has proven effective, and altered national care standards for stroke, in contrast, lower extremity robotics that has primarily focused on repetitive, multi-joint patterning of gait cycles, remains controversial, with consensus that current approaches are inferior to usual care, or even deleterious. We challenge this paradigm by testing an adaptively controlled anklebot guided by sensorimotor learning models to focus specifically on complications due to impaired paretic DF control. The profile of ankle motor learning based on repeat measures of unassisted walking reveals a power law pattern with ~80% of gains <3 weeks. Hence, TMR may prove effective within the time-frame of usual physical therapy, which increases potential for translation into VA care. Results of this study will establish a new paradigm for diverse deficit severity customized gait-integrated adaptive modular LE robotics to improve mobility function in stroke and other neurological conditions.

2 * Discuss the research design including but not limited to such issues as: probability of group assignment, potential for subject to be randomized to placebo group, use of control subjects, etc.:

Overview and rationale of experimental design: This randomized study investigates the hypothesis that 6 weeks treadmill robotic training (TMR) is more effective to durably improve gait biomechanics, static and dynamic balance, and function in chronic stroke survivors with foot drop, compared to treadmill (TM) alone. Chronic stroke defined as > 6 months post index disabling event is selected to minimize and separate the heterogeneity of early sub-acute recovery, providing a stable neurological profile to isolate the added benefits of ankle robotics integrated TM training, compared to matched-dose TM alone. This also minimizes the confounding effects of inter-current physical therapy. The reference treatment group of TM training alone is selected to isolate the added benefits of ankle robotics.

Randomization to 6 weeks TMR vs. TM Training: Subjects are randomized to 6 weeks dose matched progressive TMR or TM training, with randomized stratification based upon median split for self-selected floor walking velocity determined by 10 meter walks. TM training is progressed for both groups, as tolerated, to a mild to moderate aerobic exercise intensity (see below), and with concomitant use of the Modified Borg Perceived Exertion Scale. This design is selected to minimize imbalance between the TMR and TM group on gait velocity, a well-established determinant of mobility outcomes post-stroke.

3 * Describe the relevant prior experience and gaps in current knowledge. Describe any relevant preliminary data:

There are 23 million veterans of which about 40% are > 60 years of age, with stroke rates ~1.2-1.3% per year. This poses a large potential burden on the VA Health Care System both in terms of immediate needs for rehabilitation and longer-term health problems that tend to afflict this population. Contrary to traditional models of stroke recovery[1], there is growing evidence that new intervention strategies can reduce impairment and improve mobility function well past the time of expected plateau. Gait and balance deficits contribute to more than 70% of stroke survivors sustaining a fall within six months[2], leading to higher risks for hip and wrist fractures in the first year.[3-5] The disabling consequences of stroke often lead to loss of functional independence, not only limiting participation in community life but also setting the stage for a sedentary lifestyle that can lead to further declines in cardiovascular fitness with associated co-morbidities. Under conventional rehabilitation pathways, 50% of stroke survivors have residual gait and balance deficits six months after the incident stroke.[6] Among the more pervasive problems is impaired ankle dorsiflexion (DF) control, contributing to foot-drop that impacts the ability to safely clear the ground during swing and position the foot for a safe and stable landing into stance phase. [To put the problem in perspective, 25-30% of stroke survivors have chronic DF deficits even after cessation of all conventional therapy [7,8] and are left to live with ankle foot orthoses (AFO) that provide safety for ambulation but also lead to compensatory changes and do nothing to reverse ankle impairments]. Reversing or reducing these deficits through robotics rehabilitation, could have a significant impact on the care of Veterans with disabilities by improving mobility to enhance functional independence, and balance to reduce fall-risk, from the ground up. The advent of robotics has opened new avenues for optimizing stroke therapy through motor learning (ML). The VA Cooperative upper extremity (UE) robotics study showed that robotic therapy can promote improved arm function and be cost-effective.[9] leading to "grade-A" recommendations for implementation by both VA and Department of Defense.[10,11] However, there are many unanswered questions about methods for optimizing the effectiveness of robotic therapy in the area of lower extremity (LE) function.[12, 13] At our VA RR&D Exercise & Robotics Center of Excellence we have begun to address these knowledge gaps in the area of LE robotics using an impedance-controlled, 2 degree-of-freedom (DOF) actuated ankle robot (anklebot) as a deficit severity-customized ML tool to reduce paretic ankle impairments, and enhance gait and balance outcomes.[14]

4 * Provide the scientific or scholarly background, rationale, and significance of the research and how it will add to existing knowledge:

Stroke is the leading cause of chronic disability in our aging Veterans, and in the United States, and mobility disability the most important cause for loss of functional independence. We have made only modest progress in addressing this problem. Meta-analyses show that interventions to date, whether exercise or robotics, produce only modest incremental gains in gait and balance function, with most evidence in those with pre-existing mobility function and only mild-to-moderate gait deficits. Simply put, we currently cannot re-engineer neuromotor recovery of ADL mobility in a major life-changing manner. UE robotics, has proven effective, less expensive, and altered care standards for stroke.[9-11] LE robotics that has primarily focused on repetitive, multi-joint patterning of gait cycles, remains controversial, with consensus that current approaches are inferior to usual care, or even deleterious.

We challenge this paradigm by testing locomotor exercise integrated with modular LE robotics bio-inspired by sensorimotor learning models focused first, and specifically on the prevalent problem of ankle DF swing deficits that contribute to foot drop. Currently, stroke survivors with foot drop are trained to live with a cane or other assistive device, and often an AFO or less commonly, FES for foot clearance and safety. None of these mediate volitional task-practice [15-17] or neuromotor recovery [18-20], and in fact, may reinforce non-use. Yet, it is estimated that 1 in 4 stroke survivors are forced to chronically live with an AFO [21-23] which translates to nearly 2 million stroke survivors with chronic DF deficits. We have developed an adaptive anklebot controller that detects gait cycle sub-events for precise timing of graded impedance control ankle robotics assistance to avoid destabilization, while promoting ankle motor learning in the context of walking. [24] While this enables simultaneous on-the-fly impedance control of DF-PF and inversion-eversion (INV-EVR) customized step-by-parietic-step, our Merit Pilot data leads us to avoid a "kitchen sink" approach, and begin by investigating swing phase DF assist alone in individuals with chronic hemiparetic ankle weakness and foot drop.

This adaptive control approach targeted to DF swing appears to robustly improve independent swing phase ankle kinematics, but also plantar flexor push-off, foot orientation at landing, and elements of postural control, implicating improved balance. An equivalent amount of TM alone appears to provide none of these effects. Therefore, this adaptive control approach targeting one deficit appears to generalize benefits to global functional mobility. This Merit will provide new insights into the specificity vs. generalizability of deficit-focused modular LE robotics training on gait, balance, and free-living ADL function. Notably, the profile of ankle ML based on repeat measures of unassisted walking reveals a power-law pattern with ~80% of gains <3 weeks. Hence, adaptive control robotics may prove effective within the time-frame of usual outpatient physical therapy, increasing its potential for clinical translation into VA care. In summary, this Merit introduces a next generation of modular LE robotics with adaptive controllers for deficit severity adjusted integration into locomotor exercise. This could help generate the tools that therapists will use in the near future to re-engineer mobility recovery in neurological disease.

ID: VIEW4E02805EA0C00
Name: v2_Justification, Objective, & Research Design

View: v2_Supporting Literature

Supporting Literature

- 1 * Provide a summary of current literature related to the research: **If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer box below.**

Please see attached reference list.

2 If available, upload your applicable literature search:

Name	Created	Modified Date
References	1/5/2015 2:55 PM	1/5/2015 2:55 PM

3 * Provide a list of 3 keywords or search terms (1 per line) relevant to your research that would help potential participants find your study using search engines:

Keyword 1: stroke

Keyword 2: foot-drop

Keyword 3: robotic exercise therapy

ID: VIEW4E02805A7E400
Name: v2_Supporting Literature

View: v2_Study Procedures

Study Procedures

If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer boxes below. If some of the questions below are not applicable to the research (i.e., chart review), enter "N/A."

1 * Describe all procedures being performed for research purposes only (these procedures would not be done if individuals were not in the study) and when they are performed, including procedures being performed to monitor subjects for safety or to minimize risks:

Pre-training evaluations for the two groups (Treadmill with Robot (TMR) and Treadmill Only (TMO)).

The pre-training phase consists of informed consent, medical screening, and baseline assessments that span approximately 4 visits. Following informed consent, all subjects will undergo a complete medical history, physical examination, and a battery of functional motor assessments.

Medical Evaluation of Stroke Patients: The baseline evaluations include a complete medical history and review of medical and neuroimaging records (if available) from the incident stroke, a thorough medical and neurologic examination, as well as a resting electrocardiogram (ECG). It also includes a review of questionnaires specific to depression and neurocognitive function (Center Epidemiologic Studies Depression Scale (CESD), Mini-Mental State Exam (MMSE) and/or Montreal Cognitive Assessment (MoCA)) and the performance of preliminary functional ambulatory tests to determine patient eligibility. Clinical suspicion or evidence on the CESD, MMSE and/or MoCA of dementia, depression, severe aphasia or other major neuro-cognitive deficits that may interfere with the conduct of the study preclude further evaluation and initiate prompt referral to psychiatry or other specialist for evaluation. A neuropsychological assessment using NeuroTrax will also be administered by a clinician to evaluate cognitive function.

Screening Exercise Test: Subjects must be capable of baseline treadmill exercise testing at a speed of 75% of their Self-Selected Walking Speed, using handrail support. During the exercise tests, subjects are attended to by a physician and exercise physiologist. During the exercise test, patients have vital signs and ECG continuously monitored by a physician and personnel trained in cardiopulmonary resuscitation, ECG interpretation and exercise testing. Subjects will be instructed to walk as long as they can until they are tired and request to stop. This exercise stress test is conducted to ascertain cardiopulmonary safety and clearance for low-moderate aerobic intensity exercise. A cardiologist reviews ECG and testing results and signs off on all stress tests for final medical clearance.

Functional motor assessments: During subsequent pre-training visits the following measures are administered: (a) paretic ankle active range of motion (b) ankle strength; (c) ankle robot measures of paretic ankle function; (d) Berg Balance test; (e) self-selected and fast walks on an instrumented walkway; (f) recordings of postural adjustments during gait initiation and self-selected walking using 3-D motion analysis system and force plates; (g) Dynamic Gait Index; (h) postural sway test with eyes open and eyes closed; (i) wear an portable accelerometer during normal daily activities over a 48 hour period in the home-community setting; (j) Activities-Specific Balance Confidence Scale; (k) Stroke Impact Scale (l) Yale Physical Activity Survey. Seated rest periods will be provided between tests to minimize fatigue. These functional performance and motor control assessments will be repeated at the conclusion of training (6 weeks) and again after a 6-week retention period and a 6-month retention period during which subjects are not training.

Training procedures:

Overview:

After baseline evaluations and group assignment, treadmill and robotic training will consist of a 6-week program of 3x / week. Both approaches will target up to 30-40 minutes of activity per session. In general, training with the robot is based on an "assist-as-needed" principle, meaning that it will only generate torques if the user fails to move or delays movement for too long. When used during walking, as per the treadmill with robot training group (TMR), the robot first records ankle movements without any assistance. Initial parameters for robotic assistance (as-needed) are based on replicating these movements. Subsequently the anklebot is programmed to provide dorsiflexion (DF) torque in order to assure sufficient toe clearance during swing phase. The timing of these robotic torques is determined from footswitch signals that indicate when these gait cycle phases occur. This is an important feature that accommodates stride-to stride variability timing of these events. This approach aims to adjust the levels of robotic support by weekly probes to test performance with changes in robotic assistance levels. In TMR group all of these adjustments are made in small increments to promote adaptations.

TMR training

TMR sessions begin with a baseline visit to assess fitting of the robot along with ability for wearing the device on the treadmill. The latter is determined by having participants walk for a series of brief trials of 3-5 min without, and then with, the unpowered robot. These trials are used to set initial parameters to define the robot's output to match the subject's baseline gait. Participants then are ready to commence training. TMR training will follow a progression that targets 30-40 minutes at 60-70% heart rate reserve over the 6 weeks. The TMR training programs are individualized according to the participant's gait capacity, defined by peak heart rate (HR max) achieved during the baseline treadmill test. Training is started conservatively with at 40-50% HRR determined by a cardiologist according to the formula of Karvonen. Training target HR = $%(HR_{max} - HR_{rest}) + HR_{rest}$. Individuals unable to walk continuously will exercise intermittently for several minutes as tolerated, with interval rests, and advanced as tolerated with HR, blood pressure monitoring, and Borg Perceived Exertion to assess subjective cardiopulmonary exercise tolerance. TMR training velocity is advanced as tolerated by week 6 to a target intensity of 60-70% HRR. Fall prevention during TMR is assured with the use of safety harnesses in non-weight bearing mode and hand rail support as needed. Robot assistance follows a progressive approach matched to subject responses as well. To modify paretic ankle contributions to gait in TMR we increase DF assist levels to generate toe clearance in swing. After users adapt to this stimulus we seek to gradually reduce the robotic assist level and promote self-regulated toe clearance.

TMO training

TMO follows essentially the same progression and procedures as the TMR, with the exception that no robot will be utilized.

The TMO training is essentially the same as that proposed for the TMR group: 3x weekly for 6 weeks, with the same work progression based on heart rate reserve as currently described in the above TMR procedures section. This group will be re-tested on outcome measures after 6-weeks (18 sessions), but they will not undertake the retention tests.

- 2 * Describe all procedures already being performed for diagnostic or treatment purposes (if not applicable to the study, enter "N/A"):
N/A
- 3 * Describe the duration of an individual participant's participation in the study:
After informed consent, medical screening, baseline testing and group randomization, robotics participants will be engaged in one of the two training approaches for approximately 6 weeks (18 sessions, 3 x weekly). This is followed by a first round of post-testing that typically requires two to three visits. Then there is a 6 week retention period with no training, followed by a repeated round of testing. There is another retention test scheduled at the 6 month time point thus the total duration will span approximately 8 months.
- 4 * Describe the duration of the entire study:
This project is planned for 4 years to recruit, train, and complete all follow-up testing, including the retention-durability assessments at 6 weeks and 6-months post-training.
- 5 * Describe any additional participant requirements:
There are no additional requirements for participants to complete the study.

ID: VIEW4E0280585B400
Name: v2_Study Procedures

View: v2_Sample Size and Data Analysis

Sample Size and Data Analysis

If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer boxes below.

- 1 * Provide the rationale and sample size calculations for the proposed target population:
We chose the sample size (36 subjects completing the training per group) to have good power to detect moderate effects of the TMR at the post-training assessment. More specifically, with a sample size of 36 per group we will have 85% power to detect a difference between the groups if the mean changes in the two groups differ by 0.72 standard deviations (i.e., an "effect size" of 0.72). This calculation is based on the performance of a two-sided .05-level two sample t-test. This is a conservative projection of the power because the actual analysis will be based on a mixed effects model for repeated measures, and will be slightly more powerful than a t-test. Note an effect size of 0.72 is considerably smaller than the effect sizes we observed for the response variables in our pilot data as shown in the following table. Thus, we believe the study is adequately powered even if our findings in the proposed study are somewhat less striking than those observed in our pilot study. If we want to control the experiment-wise type-1 error rate at 0.05 we will have to test each hypothesis at the 0.007 level (to adjust for multiple comparisons). This will result in 85% power to detect on effect size of 0.90. Note that this detectable effect size is still considerably smaller than the effects observed in our pilot study for all variables except gait velocity.
- 2 * Provide the plan for data analysis. Include in the description the types of comparisons that are planned (e.g., comparison of means, comparison of proportions, regressions, analysis of variance, etc.), which is the primary comparison/analysis, and how the analyses proposed will relate to the primary purposes of the study:
Data are analyzed for normality and transformed as necessary. Robust and resistant analyses or non-parametric analyses are performed as required. Analyses of effects of interventions on gait and balance outcomes are performed using repeated measures group-by-time (GxT) ANOVA for data obtained at baseline, after 6-weeks training, and at 6-weeks and 6-months post-completion of training. Non-parametric statistics are used when appropriate. Post hoc testing is performed using Scheffe's test. Because traditional ANOVA and regression analyses eliminate subjects who are missing data from one or more time points these analyses are performed using SAS PROC MIXED that allow subjects with incomplete data to be included. Initial analyses are intention-to-treat. Subsequent analyses take compliance into account. Baseline data are used to examine predictors of treatment response. We include data analyses for each method to avoid redundancy.

ID: VIEW4E02806052800
Name: v2_Sample Size and Data Analysis

View: v2_Sharing of Results

Sharing of Results

- 1 * Describe whether results (study results or individual subject results, such as results of investigational diagnostic tests, genetic tests, or incidental findings) will be shared with subjects or others (e.g., the subject's primary care physicians) and if so, describe how it will be shared:
Typically quantitative results from robotic results and other functional measures will not be shared with the participant. If a medical problem is revealed during medical examination and screening the participant will be informed and study staff will make appropriate efforts to facilitate follow-up with the participant's primary care physician.

ID: VIEW4E02808C8D800
Name: v2_Sharing of Results

View: v2_Research with Medical Devices

Research with Medical Devices

You indicated on the "Type of Research" page that your study involves the evaluation of device(s) for safety or effectiveness or use of a HUD.

- 1 * List all devices to be used in this study:

Device Name	FDA Approved?	Labeled	IDE Number	IDE Holder
View IMT Anklebot	yes	yes	N/A	no
- 2 * Attach the device labeling or device manual for the devices being used in this study:

Name	Created	Modified Date
Anklebot manual	1/20/2015 2:05 PM	1/20/2015 2:05 PM
- 3 * Are you requesting a nonsignificant device risk determination by the IRB? (Applicable if the FDA has not issued an IDE and the device does not qualify to be IDE exempt.)
 Yes No
- 4 If yes, please provide the rationale for how the device(s) used in the study meet the following criteria:

- Is NOT intended as an implant, is NOT purported or represented to be for use supporting or sustaining human life, and is NOT for a use of substantial importance in diagnosing, curing, mitigating, or treating disease, or otherwise preventing impairment of human health.
- DOES NOT present a potential for serious risk to the health, safety, or welfare of a subject.

The anklebot is FDA approved as "powered exercise equipment" # 890.5380 (please see attached documents relating to FDA and the anklebot). It is NOT an implant, life-support device, nor is it of substantial importance for any of the above aspects of preventing impairment of human health. It is designed to facilitate reduction of impairments related to lower extremity neurologic deficits.
The device does not present a potential for serious risk to the health, safety, or welfare of users.

- 5 * Do you have a plan regarding access controls for essential and appropriate research personnel?
 Yes No
- 6 * Will you have procedures for verifying physical access of the device?
 Yes No
- 7 * Will the storage of the study device be in a secure environment and include locks on doors and controlled access?
 Yes No
- 8 * Will there be an establishment of equipment control both in to and out of the research site?
 Yes No
- 9 * Will there be a development of Security Incident Procedures to report any privacy breaches?
 Yes No
- 10 If applicable, do you have data backup, storage, and emergency mode procedures?
 Yes No
- 11 If applicable, will the storage of the device be at the appropriate temperature, with a storage and temperature log?
 Yes No

ID: VIEW4E0514D4C8C00
Name: v2_Research with Medical Devices

View: v2_Psychological/Behavioral/Educational Methods and Procedures

Psychological/Behavioral/Educational Methods & Procedures

You indicated on the "Type of Research" page that your study involves a psychological/behavioral/educational method or procedure such as a survey, questionnaire, interview, or focus group.

- 1 * Select all behavioral methods and procedures which apply to this study:
Surveys/questionnaires

ID: VIEW4E09416F57800
Name: v2_Psychological/Behavioral/Educational Methods and Procedures

View: v2_Surveys/Questionnaires

Surveys/Questionnaires

You indicated that this study involves surveys and/or questionnaires.

If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer boxes below.

- 1 * List all questionnaires/surveys to be used in the study, including both standardized and non-standardized assessments:
Montreal Cognitive Assessment (MOCA)
Mini-mental State Examination
Center for Epidemiologic Studies Depression Scale
Stroke Impact Scale
Yale Physical Activity Survey
Activities-based Balance Confidence Scale
Borg Perceived Exertion Scale

- 2 * Upload a copy of all questionnaires/surveys:

Name	Created	Modified Date
MoCA-Test-English_7_1.pdf	3/11/2015 12:10 PM	3/11/2015 12:10 PM
ABC-Scale.pdf	3/11/2015 12:06 PM	3/11/2015 12:06 PM
Yale_Physical_Activity_Survey.pdf	3/11/2015 12:05 PM	3/11/2015 12:05 PM
Borg Perceived Exertion Scale.doc	3/11/2015 12:05 PM	3/11/2015 12:05 PM
SIS_Handout.pdf	3/11/2015 12:05 PM	3/11/2015 12:05 PM
cesd-depression-test.pdf	3/11/2015 12:05 PM	3/11/2015 12:05 PM
MMSE.pdf	3/11/2015 12:05 PM	3/11/2015 12:05 PM

- 3 * What is the total length of time that each survey is expected to take?
5-20 minutes per survey

- 4 * Are any of the questions likely to cause discomfort in participants or cause harm if their confidentiality were breached? (i.e.,

Illegal activities)

Yes No

5 * Do any questions elicit information related to the potential for harm to self or others?
 Yes No

5.1 If Yes, what procedures are in place to assure safety?

ID: VIEW4E09460F5EC00
Name: v2_Surveys/Questionnaires

View: v2_Data Collection / Record Review

Data Collection/Record Review

You indicated on the "Type of Research" page that your study involves data collection or record review (i.e., chart review, not self-report).

1 * What type of data will be collected/analyzed in this study? (Check all that apply)
Prospective (data is not yet in existence and/or collected)

2 * Will this study involve adding data to a registry or database for future use?
 Yes No

3 * Will the data be released to anyone not listed as an investigator on the protocol?
 Yes No

3.1 If Yes, give name(s) & affiliation(s):

ID: VIEW4E0E25A8CA400
Name: v2_Data Collection / Record Review

View: v2_Pro prospective Data

Prospective Data

You indicated that the study involves the collection of prospective data.

1 * Where is the data being collected from? (Check all that apply)
Medical records
Other

1.1 If Other, please specify:
Functional gait and balance assessments and other training data related to the proposed interventions.

2 * What data fields will you have access to/collect for the study? For example, name, initials, date of birth, Social Security number, income, demographic information, family units, housing, etc.
Name
Date of birth
Soc Sec (for VA forms only)

You can also upload a copy of the data fields/variables to be collected for the study:

Name	Created	Modified Date
There are no items to display		

ID: VIEW4E0E25B643800
Name: v2_Pro prospective Data

View: v2_Clinical Trial Registration

Clinical Trial Registration

You indicated on the "Type of Research" page that your study is a clinical trial.

1 * Does the UM Clinical Trials Registry policy require registration of this trial?
 Yes No

2 * Has this trial been registered?
 Yes No

ID: VIEW4E093BF078C00
Name: v2_Clinical Trial Registration

View: v2_Participant Selection

Participant Selection

1 * How many local potential participants (or specimens/charts) do you anticipate will be screened for this study? **Screening includes determining potential participants' initial eligibility for and/or interest in a study.**
150

- 2 * How many participants (or specimens, or charts) will be enrolled/used for this study? **A local prospective participant is considered enrolled in the study when a UM-approved Informed Consent Document (not including separate screening consent forms) is signed.**

Local - the number being enrolled at this site:

100

Worldwide - the number being enrolled total at all sites (including local enrollment):

100

- 3 * Gender:

Male

Female

- 4 * Age(s):

18 years and older (Adult)

- 5 * Race/Ethnicity:

All Races Included

- 6 * Language(s):

English

- 6.1 Specify Other:

- 7 * Are you excluding a specific population, sub-group, or class?

Yes No

- 7.1 If Yes, indicate your justification for excluding a specific population, sub-group, class, etc.:

ID: VIEW4E0E519C1D000
Name: v2_Participant Selection

View: v2_Vulnerable Populations

Vulnerable Populations

- 1 * Will you be including ANY of the following Vulnerable Populations? (Select all that apply)

None of the above

You may not include any members of the above populations as subjects in your research unless you indicate this here.

ID: VIEW4E0E519917800
Name: v2_Vulnerable Populations

View: v2_Eligibility

Eligibility

- 1 * Do you have an existing Eligibility checklist(s) for this study?

Yes No

- 1.1 If Yes, upload here. If you need a template, you can download it by clicking **HERE**. The checklists you upload will also be available under the Documents tab of this application.

Name	Created	Modified Date
------	---------	---------------

There are no items to display

- 1.2 If No, create an eligibility checklist below:

List inclusion criteria (List each Inclusion Criteria individually, using the ADD button):

Number	Criteria
View 1	In the chronic phase of stroke (> 6 mos. post-stroke) with residual hemiparesis of the lower extremity that includes symptoms of foot-drop.
View 2	Clear indications of hemiparetic gait by clinical observation.
View 3	Completed all conventional physical therapy.
View 4	Ability to walk on a treadmill with handrail support.

List exclusion criteria (List each Exclusion Criteria individually, using the ADD button):

Number	Criteria
View 1	Cardiac history of (a) unstable angina, (b) recent (less than 3 months) myocardial infarction, congestive heart failure (NYHA category II); (c) hemodynamically significant valvular dysfunction.
View 2	Major clinical depression: CESD score > 16 and judgment of clinical depression
View 3	Hypertension that is a contraindication for a bout of treadmill training (greater than 160/100 on two assessments).
View 4	Medical History: (a) recent hospitalization (less than 3 months) for severe medical disease, (b) symptomatic peripheral arterial occlusive disease, (c) orthopedic or chronic pain conditions that significantly alter gait function, (d) pulmonary or renal failure (e) active cancer
View 5	History of non-stroke neuromuscular disorder restricting gait.
View 6	Aphasia or cognitive functioning that confounds participation, defined as unable to follow 2 step commands. The Mini Mental State Exam will be administered with a cut-off of less than 23 (less than 17 if education level at or below

8th grade), or judgment of the medical officer.

After entering the inclusion and exclusion criteria above, click the Save link. CICERO will automatically generate a printable Eligibility Checklist for you to use in your research. To review the checklist, click on the resulting link below. This checklist is also available under the Documents tab of this application.

Eligibility Checklist for HP-00062671 v3-9-2015-1425909209986(0.01)

ID: VIEW4E0E5185F9000
Name: v2_Eligibility

View: v2_Recruitment

Recruitment

1 * Describe plans for recruitment, including the identification of potential participants (or acquisition of charts/records/samples) and initial interactions with them:

Some participants with stroke will be recruited by IRB approved flyers or word of mouth. Initial interactions will consist of a phone call from a research staff member stating that we are contacting the individual based on their expressed interest in the study. Other participants will be recruited from the University of Maryland Rehabilitation & Orthopaedic Institute Stroke Registry (UMROI) Stroke and Pepper Center registries which are approved by UMB IRB. Other participants will be recruited using specialized searches on VA CPRS. The UMROI Stroke Registry, Pepper Center Registry and VA CPRS will all be used to identify and conduct preliminary screening of potential participants. Initial interactions will consist of a phone call from a research staff member stating that we are contacting the individual based on their prior willingness to be contacted about new research studies and asking if they would be interested at this time in learning about our new project. If they are interested in learning more about the study, the caller will briefly outline the study and describe the initial visit that includes the Geriatric Assessment Clinic (GAC) for obtaining informed consent and assessment of eligibility for the study. If still interested the caller will inquire about available times that the potential participant could come to the Baltimore VAMC, and subsequently schedule an appointment for the initial visit. During this initial phone contact, research staff will not request the veteran's social security number.

During recruitment and screening, patients with major neurocognitive impairment, depression, dementia or elements of aphasia that would interfere with the study are identified and excluded. Those interested in the study and with no apparent exclusionary criterion at the time of initial screening are scheduled to come in to hear about the study in detail and carefully go over the consent with trained staff. Any of the co-investigators or staff listed on the protocol, may obtain consent prior to the GAC assessment.

We will attempt to enroll as many Veteran participants as possible in this VA-funded human research study. However, we do anticipate recruitment of at least some non-veterans, assuming that recruitment of Veterans-only may prevent timely completion of this 4-year randomized controlled study. Also, we may need to recruit non-veterans to expand the range of deficit severity in the stroke group, to better define future applicability of lower extremity robotics to studies in the larger stroke population. Scientifically we expect that results obtained from any non-veteran stroke survivors will be similar to that potentially gained from veterans who have had a stroke, and data from qualified healthy volunteers should also be similar to that of healthy Veterans.

We will also use IRB-approved flyers to be posted in the surrounding community. Respondents will call the listed phone number and the above process will be carried out as with those re-contacted via the registry.

2 * Describe measures that will be implemented to avoid participant coercion or undue influence (if not applicable to the study, enter "N/A"):

Participants will be informed that they have an absolute right to withdraw from the study at any time for any reason. It will be emphasized upon withdrawal that they will not lose eligibility for medical care or services at the VA or University of Maryland Medical Center, nor will they lose eligibility to participate in any future research studies. Informed consent will follow institutionally approved guidelines, including protection of confidential information relating to medical history and other information gathered to determine eligibility criteria.

3 * Who will recruit participants (or acquire charts/records/samples) for this study? (Check all that apply)
Study Staff

3.1 If you are using a third party, specify Third Party Recruiters:

4 Upload any recruitment tools such as screening/telephone scripts and introductory letters (do not upload advertisements here):

Name	Created	Modified Date
There are no items to display		

ID: VIEW4E0BCAA0A6C00
Name: v2_Recruitment

View: v2_Advertising

Advertising

1 * Will you be using advertisements to recruit potential participants?

Yes No

ID: VIEW4E0BCCF811000
Name: v2_Advertising

View: v2_Advertising Detail

Advertising Detail

You indicated that you will be using advertisements to recruit potential participants.

1.1 * Select the mode(s) of advertising (check all that apply):

Other

1.1.1 If Other, specify:

Flyers

1.2 * Provide exact text of all proposed advertisement(s):

Stroke Survivors Needed for Robotics Research.

18-90 year-old volunteers who are at least 6 months post-stroke are needed for a research

study investigating use of an ankle robot in gait and balance rehabilitation after stroke.

If you would like to learn more or would like to participate, please call 410-637-3245.

Baltimore Veterans Affairs Maryland Health Care System,
10 N. Greene Street, Baltimore, Maryland 21201.

1.3 * Upload advertisement(s) here:

Name	Created	Modified Date
Stroke Survivors Needed for Robotics Research.docx	3/11/2015 12:18 PM	3/11/2015 12:18 PM

ID: VIEW4E0BC8288C00
Name: v2_Advertising Detail

View: v2_Research Related Risks

Research Related Risks

If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer box below.

- * Individually list each research-related risk, using a separate line for each. Next to each risk, delineate the likelihood/seriousness of the risk, and the provisions for minimizing the risk:
 - There is a risk that repeated movements while wearing the ankle robot may cause skin irritation at contact points. This risk is greatly reduced by using extra foam padding to securely fit the robot. Also, regular inspection of the attachments and queries to the subject are used to prevent this problem from developing.
 - During overground and treadmill walking tests or training there is a minimal risk of falling. The likelihood of falling is reduced by the use of a gait belt and/or safety harness with close supervision by study personnel.
 - There is a small risk that you will fall, get chest pain, shortness of breath or become dizzy. There is a small risk of muscle strain or pulled muscles in the measurement of strength. The test will be stopped if you have any symptoms such as chest pain. We have performed more than 1000 tests of functional performance without complication.
 - There is a very slight risk that the robot could move the foot in the wrong direction causing injury. This is extremely unlikely as maximal torque outputs by the robot are not sufficient to induce muscle, tendon, or ligament injuries. Further protection is provided by failsafe switches that turn the robot off in 2 ms.
 - Treadmill exercise testing risks are minimal, but occasionally include fainting, dizziness, chest pain, or irregular heartbeats. A heart attack may occur, but this is extremely rare (< 1 death in 10,000 tests) in people without a history of heart disease. To reduce these risks, blood pressure, heart rate and rhythm, and breathing are continuously monitored during exercise testing by an MD and personnel trained in CPR, exercise testing, and emergency treatment. Emergency medications and resuscitation equipment are available.
 - There is a risk of muscle soreness after exercise tests and training. This is a relatively rare occurrence for submaximal efforts, but it is more likely in the early stages of training when subjects are unused to the exercise activities. The risk is reduced by providing regular opportunities to rest.
 - There is a small risk that subject privacy/confidentiality may be compromised. Several procedures are in place to minimize this risk. Participants are provided privacy during research interactions with the research team. The PI and research team will keep identifiers linking names to research codes in a secure file locked in a cabinet in the locked research space or the PI's office. Only the PI and research team will have access to this information on an as-needed basis. Only the research codes will be used for data collection and training records.
 - Screening and treadmill testing will be done at the Baltimore VA Medical Center, where a crash cart and emergency medications are available.
 - For medical emergencies that occur at the Baltimore VA Medical Center Annex or the Baltimore VA Loch Raven facility, an AED is available on site and the 911 emergency medical system would be activated by the research team.

ID: VIEW4E1B52509F000
Name: v2_Research Related Risks

View: v2_Potential Benefits and Alternatives

Potential Benefits and Alternatives

If you uploaded a separate research protocol document in the 'Research Protocol' page, cite the applicable section and page numbers from that document in the answer boxes below.

- * Describe the potential direct benefit(s) to participants:
The participant may or may not benefit by taking part in this study. There is no guarantee that the participant will receive direct benefit from participating in this. A potential benefit of participation is to help in the development of new robotic therapies for stroke survivors. There is a potential benefit in defining those who can successfully use this new robotic approach after stroke.
- * Describe the importance of the knowledge expected to result from the study:
As our adult population ages, the number of strokes in the United States is anticipated to double, reaching nearly 1.5 million annually by the year 2050. The opportunity to define the appropriate use of rehabilitation robotics in the restoration of gait and balance functions in this population has major implications for improving overall mobility and reducing risks for further debilitating injuries through falls. In addition, the use of robotics affords a unique opportunity to study the processes of motor learning that inform contemporary rehabilitation strategies and suggest optimal approaches for mediating mechanisms of neuroplasticity. These benefits outweigh the minimal risks that may arise from using robotics in a controlled rehabilitation setting.
- * Describe how the potential risks to participants are reasonable in relationship to the potential benefits:
By comparing the effects of robotics treadmill training to treadmill only training we will advance our understanding of how these specific approaches may impact the crucial functional areas of locomotion and balance control. This work is essential to provide the evidence base needed to objectively define appropriate use of lower extremity robotics in the rapidly evolving field of stroke rehabilitation. The risks of using the ankle robot in closely supervised training conditions are minimal, compared to the potential positive impact on participants and on the longer term goal to develop effective robotic therapies that could enhance the health and quality of life of millions of other stroke survivors.
- * Describe the alternatives to participation in this study. If there are no alternatives, state that participation is voluntary and the alternative is not to participate. For intervention studies, describe appropriate alternative clinical procedures or courses of treatment available to subjects.
There are no alternatives to participation in this study. Participation is voluntary and the alternative is not to participate.

ID: VIEW4E1B5251B0400
Name: v2_Potential Benefits and Alternatives

View: v2_Withdrawal of Participants

Withdrawal of Participants

If the questions below are not applicable to the research (i.e., chart review), enter "N/A".

- 1 * Describe anticipated circumstances under which subjects will be withdrawn from the research without their agreement:
Participants may be withdrawn from the research without their prior agreement under the following circumstances:
- poor attendance leading to insufficient training
- entering participation in other exercise protocols or activities that would confound results of this study
- emergent medical problems that preclude continuing with the training protocols
- 2 * Describe procedures for orderly termination:
Orderly termination of the study will occur at the conclusion of the final measurement session. At that time the participant will be informed of any interim results to indicate how they have performed during the course of the study if they request such information. In the event that a participant requests an early termination, the study PI or research staff will discuss the reasons and offer any interim feedback available on the participant's progress during the study at that point.
- 3 * Describe procedures that will be followed when subjects withdraw from the research, including partial withdrawal from procedures with continued data collection:
When participants withdraw a note will be placed in their file indicating their reasons for withdrawal.
In rare cases if a participant is unable to complete all planned procedures but it is determined that this will not compromise the scientific integrity of the study a note will be made to file explaining the circumstances.

ID: VIEW4E1B52531F800
Name: v2_Withdrawal of Participants

View: v2_Privacy of Participants

Privacy of Participants

If the study does not involve interaction with participants, answer "N/A" to the questions below.

- 1 * Describe how you will ensure the privacy of potential participants throughout the study (**privacy refers to persons and their interest in controlling access to themselves**):
Privacy will be ensured during the consenting process by having the potential participant meet with study personnel in a private office, or in the VA Human Motor Performance Laboratory or other private setting to review consent forms and discuss study procedures. Only trained staff will conduct these meetings and the participant's identity will never extend beyond the research team.
- 2 * Describe the location where potential participants will receive research information and detail the specific actions the study team will take to ensure adequate privacy areas:
Screening and consent activities with participants will be conducted in the Baltimore VAMC Geriatric Assessment Clinic or VA Human Motor Performance Laboratory and/or Loch Raven Robotics and Exercise Center in a private examination/interview area, or in another private office area, away from public traffic where only the member(s) of study research team may see or overhear the participant.
- 3 * Describe potential environmental stressors that may be associated with the research:
This research will not introduce new environmental stressors to the participants.

ID: VIEW4E1B525B87C00
Name: v2_Privacy of Participants

View: v2_Confidentiality of Data

Confidentiality of Data

- 1 * Will stored research data contain identifiers or be able to be linked to and identify individual participants (either directly or through a code/research ID)?
Yes
- 2 * Where will research data be kept (address electronic and paper data as applicable)?
All research subjects are assigned a unique identifying number and all data processing is done utilizing this number rather than name, social security number, birth date or other specific individual identifying information. All research data with identifiers are kept in locked cabinets, and all digital data on research computers are protected by network firewalls and passwords. The data collected will be used for research purposes only. Analysis will primarily be in the form of averaged group results. Electronic data will be stored on VA servers while paper is stored in a locked room.
- 3 * How will such data be secured?
A master file with the names and numbers of the research subjects will be maintained by the PI and kept in a locked file cabinet in a locked area. All data from tests and training will be de-identified and recorded into electronic file formats that will be stored behind the firewall and password protected network. Transmission of any electronic data will utilize file encryption. No data will be stored on a hard drive. All data will be stored on a server and backed up daily on server
V:\whabalrsch1\hmpl_share\Footdrop Merit
As per current VA policy, all data, including the investigator's research records and any participant identifiers will be retained in accordance with the Dept. of Veterans Affairs Records Control Schedule (RCS 10-1), and will not be destroyed. If at a later date the VA policy changes data will be destroyed using the most current approved methods available.
- 4 * Who will have access to research data?
Only the PI and his research team will have access to the research data.
- 5 * Will study data or test results be recorded in the participant's medical records?
 Yes No
- 6 * Will any data be destroyed? (**Please note that data for FDA regulated research and VA research cannot be deleted**)
 Yes No
- 6.1 If Yes, what data (e.g., all data, some recordings, interview notes), when and how?
- 7 * Do you plan to obtain a Certificate of Confidentiality?
 Yes No

- 7.1 If Yes, upload your Certificate of Confidentiality. If you have not yet obtained the Certificate, please note that once it is obtained, you will need to submit an amendment to attach the document, make any needed changes to the submission and make needed changes to the Informed Consent Document.

Name	Created	Modified Date
There are no items to display		

- 8 * Discuss any other potential confidentiality issues related to this study:
No research data will be removed from the VA protected environment. All access to data will be terminated when a staff member leaves employment or is no longer a member of the research team. If there is a loss of data, unauthorized access to sensitive data, or non-compliance with security controls it will be immediately reported to the PI, and the appropriate VAMHCS Privacy Office and Information Security Personnel. The VA Research Compliance Office and IRB will also be notified.

ID: VIEW4E1B526E0400
Name: v2_Confidentiality of Data

View: v2_Monitoring Plan Selection

Monitoring Plan Selection

- 1 * Type of data safety monitoring plan for the study:
Data Safety Monitoring by a Committee

ID: VIEW4E1B00E30D400
Name: v2_Monitoring Plan Selection

View: v2_Monitoring Plan - Committee

Monitoring Plan - Committee

You indicated that the monitoring will be done by a Committee.

- 1 * Will the Committee be Internal or External?
Internal DSMB
- 2 * What data will be reviewed?
Adverse Events
Enrollment Numbers
- 2.1 If Other, specify:
- 3 * What will be the frequency of the review?
Bi-Annually
- 3.1 If Other, specify:
- 4 * Safety monitoring results will be reported to:
IRB
Other
- 4.1 If Other, specify:
VA Research & Development Committee/Compliance Office

ID: VIEW4E1B025761800
Name: v2_Monitoring Plan - Committee

View: v2_Monitoring Plan - Internal DSMB

Monitoring Plan - Internal DSMB

You indicated that the monitoring committee will be an internal DSMB.

- 1 * List Internal DSMB Members:

Name
View Christopher Bever
View Charlene Hafer-Macko
View Larry Forrester
View Jaime Lush
View Richard Macko
View Leslie Katzel
View Alyssa Stookey
View Susan Conroy
View William Scott
View Lynda Robey
View Robert Asbury
View Jeremy Rietschel
View Kate Fiske
View John Sorkin
View Terra Hill
View Jessie Mendoza
View Jill Whittall
View Bradley Hennesie
View Fred Ivey

2 * Confirm that no financial or other conflicts of interest exists for the above individuals.

Yes No

3 * Will there be an interim efficacy analysis?

Yes No

3.1 If Yes, when?

4 * Briefly describe the DSM review process itself. Will it be an open or closed review to the investigator? Blinded/unblinded data? How will confidentiality of individual participant data be maintained?

Committee meets bi-annually to review all adverse events, enrollment status, audit results or study related procedures. The committee may also meet on an ad-hoc basis if needed. Attendance is open to investigators but PI's must recuse themselves from actual decision making of their own study. Participants are de-identified for purposes of committee discussion and determination of action plans

FROM BMI

The DSM process involves updating on any adverse events and how they have been addressed. Also the basic progress of the study will be reported generally (enrollments etc.). If deemed necessary the board will make recommendations on whether additional modifications in the protocol are warranted. This can be an open review to investigators or study coordinators. Discussion of cases involving specific participants will not refer by their name(s) but by coded identifiers. Other PHI may be needed to fully characterize such cases, but these will not be reported beyond what is minimally necessary to provide the DSMB sufficient information to arrive at a decision

5 * What are the criteria defined in the protocol to be used for decision making regarding continuation, modification, or termination of study?

If the participants are tolerating the treadmill and ankle robot sessions without any adverse reactions, the study will be continued. If the participants are having difficulty staying engaged with the walking or robot games for the full session, leading to incomplete exposure to the exercise and robotics modalities, then they will be withdrawn from the study. If a participant develops a condition, such as ankle sprain or acute gout, which would preclude participation in the study, or if there is an emergent inability to perform either form of exercise, the participant will withdraw from the study. A participant who becomes medically unstable may temporarily suspend participation in the study, but re-enter when the condition is resolved

FROM BMI

The criteria are based first on the safety of participants and second on their compliance with protocol as they move through the study phases.

The UM IRB and VA R&D will make all decisions regarding continuation, modification, or termination of the study.

The failure to follow GCP (investigator non-compliance) may be grounds for suspension or termination of a study.

ID: VIEW4E1B0261D9400
Name: v2_Monitoring Plan - Internal DSMB

View: v2_Research Related Costs

Research-Related Costs

1 * Is the study's financial supporter (e.g., commercial sponsor, federal or state grant or contract, private foundation, physician-sponsor) covering any research-related costs?

Yes

1.1 If Yes, check all that apply:

Research-Related Services (personnel costs, tests, supplies, exams, x-rays, or consultations required in the study)

Investigational Procedure(s)

1.2 If No, who is responsible for payment?

2 * Who is responsible for the uncovered research-related costs?

Participant

2.1 If Other, specify:

3 If the participant is responsible for any research-related costs, identify and estimate the dollar amount:

The participant is required to provide their own transportation to and from the testing / training. They do not have to pay for parking costs.

ID: VIEW4E1B5D9641800
Name: v2_Research Related Costs

View: v2_Compensation for Research-Related Injury

Compensation for Research-Related Injury

1 * Is this study under a master agreement that includes a provision requiring the sponsor to provide compensation to participants for research-related injury?

Yes No

1.1 If Yes, please provide the date and title of the agreement and upload the portion of the contract language relevant to compensation for research-related injury:

Name	Created	Modified Date
There are no items to display		

1.2 If No (the study is not under a master agreement), is there proposed contract language concerning payment to participants for treatment in the event of a research-related injury?

Yes No

1.2.1 If Yes, indicate the status of the contract review/approval with the ORD and upload the proposed language relevant to compensation for research-related injury:

1.2.2 Name Created Modified Date
There are no items to display

ID: VIEW4E1B629EEC000
Name: v2_Compensation for Research-Related Injury

View: v2_Payment to Participants

Payment to Participants

1 * Will participants receive payment (money, gift certificates, coupons, etc.) for their participation in this research?
 Yes No

ID: VIEW4E1C52A5D7800
Name: v2_Payment to Participants

View: v2_Payment Detail

Payment Detail

You indicated that participants will receive payment (money, gift certificates, coupons, etc.) for their participation in this research.

1 * Payment to participants will be for: (check all that apply)
Other

1.1 If Other, specify:
Compensation for participating at a rate of \$10 per visit.

2 * What is the total dollar value of the payments over the duration of the study? **Total payment(s) for participation in research of \$600 or more is required to be reported on an IRS Form 1099.**
Approximately \$280 @ \$10/ visit (may vary slightly if visits are missed).

3 * Describe the timing and distribution plan for the payment (schedule, means, etc.)?
The VA requires that we issue vouchers for the participants to redeem at the VA cashiers office. Vouchers for visits 1-24 will be distributed at the completion of the 24th visit in the amount of \$240. Vouchers for visits 25-28 will be distributed at the completion of the 28th visit in the amount of \$40. In total, participants who complete the intervention will receive \$280. In the event a participant does not complete the intervention, they will receive \$10 per session to be paid on the last day of their participation. Participants will receive a voucher at the Baltimore VA Annex Human Motor Performance Laboratory or Loch Raven VA Exercise and Robotics Center to be redeemed at the Baltimore VA Medical Center cashiers office

4 * Method(s) of payment to be Used:
Other

4.1 If Other, specify:
Vouchers for redemption at the Baltimore VA cashier desk.

ID: VIEW4E1C54A6ACC00
Name: v2_Payment Detail

View: v2_HIPAA

HIPAA (Health Insurance Portability and Accountability Act)

1 * HIPAA applies to the University of Maryland School of Medicine, the University of Maryland School of Dentistry and the VA. Are you affiliated with, or will be accessing data from, any of these places? Yes No

2 If Yes, will the study view, access, share, collect, use, or analyze health information that is individually identifiable under HIPAA? Yes No

ID: VIEW4E1B0A2114400
Name: v2_HIPAA

View: v2_Protected Health Information

Protected Health Information (PHI)

You indicated that HIPAA applies and the study will view, access, share, collect, use, or analyze health information that is individually identifiable.

1 * Which PHI elements will be used or disclosed in this study? (Check all that apply)
Name
Dates
Telephone numbers
Social Security numbers
Medical record numbers

2 * Why is the PHI necessary for this research?
If SSNs are going to be used, describe the specific use and type of SSN to be used (real, scrambled, last 4 digits).
We will be required to enter the real, full social security number, date of birth, and name to enroll participants into the VA medical CPRS system and the GERI database. This information will be recorded on VA Form 1010-EZ which is submitted to the VA for entry into CPRS by authorized VA personnel and stored in their chart. We do not retain a copy of this form, but we do store the SS# in the participant's files.

- 3 * **What is the source(s) of the PHI?**
The source of the PHI would be from patient report and medical records.
- 4 * **Provide written assurance that Protected Health Information will not be reused. (Note: this refers to re-use on another study or for a purpose which has not been approved, not to the re-use of screening data during the current study).**
The PHI collected for the conduct of this study will not be used for another study or for any other purpose that has not been approved.
- 5 * **How will permission to allow the use/disclosure of the individual's protected health information (PHI) be obtained? (Choose all that apply:)**
Obtain written authorization (*upload authorization form at the end of the application under "Consent and HIPAA Authorization Forms"*)
Requesting waiver/alteration of authorization (includes waiver of authorization for recruitment only)
- 5.1 **If you are using a limited data set (LDS), please attach the Data Use Agreement (DUA):**
- | Name | Created | Modified Date |
|-------------------------------|---------|---------------|
| There are no items to display | | |

ID: VIEW4E1B0A24AA400
Name: v2_Protected Health Information

View: v2_Waiver/Alteration of Authorization

Waiver/Alteration of Authorization

You indicated that a waiver/alteration of authorization is requested.

- 1 * **Provide rationale for how the research presents no more than minimal risk to the privacy of individuals:**
The PI and study personnel will take every reasonable step to protect PHI. All PHI will be stored in locked room within a locked file cabinet. Only authorized study personnel who have completed HIPAA, Privacy and Information Security, and CITI training will have access to PHI. Research compliance officers of the VA R&D conduct routine audits to ensure proper usage and destruction of PHI. Full social security numbers are only used to enroll participants into the VA medical CPRS system. Social security numbers are not retained or stored within participant files. Because of these measures taken, our research does not present more than a minimal risk to the privacy of individuals.
- 2 * **Describe the plan to ensure the protection of PHI collected during this study from improper use and disclosure:**
We will protect this information from improper use by removing the subject's name, date of birth, and contact information from all research data collection and data storage files. The file for decoding the numeric identifiers will be kept in a locked file within a locked office. Only selected information from medical records will be recorded onto coded files in order to characterize the nature and history of stroke and the research encounters during the study, to protect individual identities.
- 3 * **Describe the plan to destroy the PHI collected during this study at the earliest opportunity consistent with the conduct of the research. If there is a need to retain PHI, provide a justification:**
All data, including the investigator's research records and any participant identifiers will be retained until the maximum retention period is reached as defined by the Dept. of Veterans Affairs Records Control Schedule (RCS 10-1). When the maximum retention period is reached, the data will be destroyed using the most current electronic data destruction methodologies that are available at the time of data destruction.
- 4 * **Why could the research not practicably be done without access to and use of this PHI?**
The PHI are needed to establish that potential participants listed in these registries meet basic entry requirements i.e. history of stroke, time since stroke, and presence of gait deficits. Not everyone who has had a stroke can be considered for this robotics study. It is necessary to evaluate the basic clinical and demographic information to see if subjects are initially eligible, medically safe, and appropriate in terms of deficit severity to even be considered for robotics training. The waiver is the alternative to a 2-3 hour in person evaluation to see if subjects' are medically eligible and safe to enter; a process that would increase participant burden.
- 5 * **Why could the research not practicably be done without the waiver or alteration?**
Present recruitment methods (flyers, physician referrals) are not generating the participant flow we need to meet our aims in a timely manner. Waiver would gain us access to the University of Maryland Rehabilitation & Orthopaedic Institute Stroke Registry, the Pepper Center Registry and specified searches within VA CPRS, giving us hundreds of potential participants.
- 6 * **Will the subjects' PHI be disclosed to (or shared with) any individuals or entities outside of UM?**
 Yes No
- 6.1 **If Yes, describe the individuals or entities outside of UM to whom PHI will be disclosed.**
This research is being conducted at the Baltimore VA Medical Center. Therefore, some of the study personnel are VA employees and will have access to PHI. The VA R&D may also choose to audit our records and may require access to PHI.

ID: VIEW4E1B0A2896400
Name: v2_Waiver/Alteration of Authorization

View: v2_Informed Consent Process

Informed Consent Process

If the study does not involve interaction with participants or a waiver of consent is being requested , answer "N/A" to the questions below.

- 1 * **Indicate the type(s) of consent that will be involved in this study: (check all that apply)**
Written Consent Form
- 2 * **Describe the Informed Consent process in detail:**
FROM BMI

Those interested in the study and with no apparent exclusionary criterion at the time of initial screening are scheduled to come in to hear about the study in detail and carefully go over the consent form with trained staff at the at the VA Medical Healthcare System (VAMHCS), specifically the Baltimore VA Annex, Baltimore VA Medical Center, and/or the Baltimore VA Loch Raven Facility. A trained research staff member will obtain consent, and upon signing the document, the subject will be provided with a copy. Family members and/or caregivers are encouraged to accompany the study candidate through all processes of the informed consent. In addition to standardized screening tests and examinations, a custom questionnaire assessing patients' comprehension of our consent form and study is then administered (see Additional Documents). Candidates are required to get questions correct to indicate adequate comprehension to sign the study consent and to enter.

In keeping with the privacy requirements, a) social security numbers of subjects will not be solicited, b) research staff will restrict contacts with subjects to the procedures and data elements outlined in the IRB approved protocol and c) verification of the study will be provided following the guidelines set forth in HRPP/IRB policies and procedures 10G. In addition, in case of patients who are veterans, guidelines put forth in the Department of Veterans Affairs memo dated 7/10/06 will be followed.

3 * Confirm that the consent process will explain the following:

- The activities involve research.
- The procedures to be performed.
- That participation is voluntary.
- The name and contact information for the investigator.

Yes No

4 * Describe who will obtain Informed Consent:

The PI or research team members who have been trained to obtain informed consent.

5 * If obtaining consent from a legally authorized representative (LAR), describe how you will confirm that the individual is the LAR and can provide legally effective informed consent. (Answer "N/A" if not obtaining consent from LARs)

N/A

6 * Describe the setting for consent:

In a private interview or conference room in the VA Medical Healthcare System (VAMHCS), specifically the Baltimore VA Annex, Baltimore VA Medical Center, and/or the Baltimore VA Loch Raven Facility

7 * Describe the provisions for assessing participant understanding:

A brief questionnaire "Ability to Give Informed Consent" is administered after the consent process to verify that the participant understands key information given during the consent process.

8 * Describe the consideration for ongoing consent:

At each encounter for testing or training, the participant will be reminded of what the study asks them to do and whether they wish to continue with the protocol.

ID: VIEW4E1C661D0AC00
Name: v2_Informed Consent Process

View: v2_Consent Forms - Draft

Consent and HIPAA Authorization Forms - Draft

1 Upload all of your Consent Forms for approval. Use only Microsoft Word.

Name	Created	Modified Date
VA consent form	3/23/2015 2:30 PM	5/22/2015 1:59 PM

IMPORTANT NOTE: the above list of consent forms (if any) are DRAFT versions. Under no circumstances should copies of these be distributed to patients/study subjects. If/when this research submission is approved by the IRB, approved consent forms will be available for download and use from the "Documents" tab of the Submission's workspace (click Exit and then look for the Documents tab - approved submissions only)

2 Upload any HIPAA authorization forms here:

VAMHCS HIPAA Authorization ABOT-FOOTDROP MERIT.docx	3/9/2015 11:39 AM	5/22/2015 1:59 PM
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Please refer to HRPO's website for specific instructions for preparing informed consent documents and to access current templates:
<http://hrpo.umaryland.edu/researchers/consents.html>

ID: VIEW4E1C7712D3000
Name: v2_Consent Forms - Draft

View: v2_Organization Review Requirements (other than IRB)

Organization Review Requirements (other than IRB)

Answer the following questions to determine additional organizational review requirements:

1 **Department/Division Review** - All research submissions are required to undergo department/division/institutional review prior to IRB review. The following entity is listed as the required department/division/institutional review:

Physical Therapy

If this information is incorrect, please notify the HRPO office.

2 **RSC Review Criteria** - select 'Yes' if the answer is 'Yes' for any of the following questions. Review by the Radiation Safety Committee may be required.

* 2.1 Does the research involve the use of ionizing radiation? Yes No

2.2 Does the research involve the sampling of radioactive human materials for subsequent use or analysis in a laboratory?

3 **IBC Review Criteria** - select 'Yes' if the answer is 'Yes' for any of the following questions. Review by the Institutional

Biosafety Committee may be required.

* 3.1 Does the research involve human gene transfer?

Yes No

-OR-

Does the research specifically apply to human studies in which induction or enhancement of an immune response to a vector-encoded microbial immunogen is the major goal, and such an immune response has been demonstrated in model systems, and the persistence of the vector-encoded immunogen is not expected? This type of research is often referred to as recombinant vaccine trials.

3.2 Does the research involve: a) the exposure of human subjects to pathogenic microorganisms, or b) the potential exposure of UMB research staff to infectious materials through the sampling or processing of materials from patients with known infectious disease or from environmental surfaces?

3.3 Does the research involve the sampling of materials from persons with no known infectious disease and where the only risk to study staff is occupational exposure to bloodborne pathogens as defined by the OSHA Bloodborne Pathogen Standard?

4 **Cancer Center Criteria** - Answer the following to determine if review by the Cancer Center (Hematology-Oncology) may be required.

* Does the protocol involve in any way studies related to the prevention, treatment, diagnosis, or imaging of neoplastic diseases?

Yes No

5 **General Clinical Research Center Review Criteria** - the GCRC offers free and/or cost shared resources for patient-oriented research. Click Here for more information.

Answer the following to determine if review by the GCRC may be required.

* Will the General Clinical Research Center (GCRC) facility or resources be used to conduct this activity?

Yes No

6 **VA Review Criteria** - Answer the following questions to determine if review by the VAMHCS R&D Committee may be required.

* 6.1 - Will the research be conducted by VA Investigators including PIs, Co-PIs, and Site Investigators on VA time (serving on compensated, WOC, or IPA appointments)?

Yes No

* 6.2 - Will the research utilize VA resources (e.g., equipment, funds, medical records, databases, tissues, etc.)?

Yes No

* 6.3 - Will the research be conducted on VA property, including space leased to and used by VA?

Yes No

PLEASE NOTE that the research may be funded by VA, by other sponsors, or may be unfunded.

ID: VIEW4E1AF91AB2400

Name: v2_Organization Review Requirements (other than IRB)

View: v2_Use of Non-Veterans

Use of Non-Veterans

1 * Describe who will be enrolled in this study:

Non-veterans will be enrolled in this study

1.1 If non-veterans will be enrolled in this study, provide the justification* for the enrollment of non-veterans in this research:

We make ongoing attempts to enroll veteran stroke survivors in our study. However, we have found over many years to achieve prescribed sample sizes for our research studies, we have to accept non-veterans as participants. Further, because the majority of veterans tend to be males, we often rely on recruiting non-veterans to achieve balance between genders.

*VA research needs to be relevant to Veterans or active duty military personnel. Non-Veterans may be entered into an approved VA research study when the investigator can present a compelling argument to the IRB for the inclusion of non-Veterans (e.g., insufficient number of Veterans; survey of VA employees; study of active duty military; study involving Veterans' family members), and the research is relevant to the care of Veterans or active duty military personnel. [VHA Handbook 1200.05]

ID: VIEW4E1C7A737E800

Name: v2_Use of Non-Veterans

View: v2_VA Prohibited Research

VA Prohibited Research

1 * Is the research planned emergency research in subjects from whom consent can not be prospectively obtained?

Yes No

2 * Does the study involve fetuses?

Yes No

3 * Does the study involve in vitro fertilization?

Yes No

4 * Does the research involve work with embryonic stem cells?

Yes No

5 * Does the study involve children **AND** is greater than minimal risk?

Yes No

6 * Will recruitment phone calls involve asking veterans for their Social Security numbers?

Yes No

ID: VIEW4E1C8AF03A400
Name: v2_VA Prohibited Research

View: v2_VA Review Required

VA Maryland Health Care System Review Required

1 **Note:** Based on the answers you provided, this is a VA study. You must obtain approval of the VAMHCS R&D Committee before you may engage in any research activity at the VA. After this protocol is approved by the IRB, you must submit the protocol to the VAMHCS Research Service **within 60 days of IRB approval.**

HOWEVER, VA regulations require the following items to be addressed **as part of your CICERO application NOW.** Please do the following **NOW** as part of this CICERO submission:

1. Information security and privacy requirements must be reviewed by the VAMHCS Information Security Officer (ISO) and Privacy Officer (PO) prior to IRB review & approval (whether full board, expedited or exempt). Therefore, please do the following **NOW** as part of this CICERO submission:
 - o Download the [Information Security and Privacy Checklist for New Protocols](#), or the [Information Security and Privacy Checklist for CRs and Mods](#) and when you complete the CICERO sections on "Privacy", "Confidentiality", "Data", "Additional Documents" or other applicable sections keep the elements of the checklist in mind. Be sure that your CICERO application answers all the questions on the Information Security & Privacy Checklist.
 - o Using a separate document to answer questions not asked in CICERO is highly recommended.
 - o Complete the checklist and **upload the completed checklist and any associated documents into the "Additional Documents" section of CICERO.**
2. "Collaborative studies" (studies in which both the VA and the UM have some engagement in the research) require additional decisions and documentation with regard to overall protocol design. (This does not apply to studies that are completely VA (for example, fully VA funded, occurring completely at the VAMHCS or with VA staff, etc.) If this study is a "collaborative study", please do the following **NOW** as part of this CICERO submission:
 - o Download the [Guidelines and Template for Developing a "VA-UM Collaborative Protocol"](#) and complete the [Collaborative Studies: PI Tool & Template](#) and the applicable CICERO sections with the elements of the template in mind. **Upload the completed template** and any associated documents into the "Additional Documents" section of CICERO.
 - o Use of the [Collaborative Study Decision Flowchart](#) and the [Collaborative Studies: Reviewer Guide for Separation of VA vs. Non-VA Research](#) is strongly recommended.
 - o It is possible that you may need to consider options such as:
 - creating separate identical UM and VA protocols with data to be combined at the end;
 - creating a single protocol with one VA consent form & HIPAA authorization that clearly describes VA and UM elements;
 - creating a single protocol with two consent forms & HIPAA authorization: one that clearly describes VA elements, the other clearly describes UM elements; other scenarios are possible.

The following are additional elements that will be required in order for a project to receive approval as a VA research project (R&D Committee approval):

- Principal investigator and all research staff engaged in the research at the VAMHCS must be VA employees or have "without compensation" (WOC) appointments
- VA credentialing of applicable members of the research team
- Research scopes of practice for applicable members of the research team
- VA mandatory trainings must be current
- Review by the VAMHCS Subcommittee on Research Safety (SRS) (RPSS Form)
- VAMHCS Investigational Drug Service arrangements (as applicable)
- VAMHCS Radiation Safety review (as applicable)
- Cooperative Research and Development Agreement (CRADA) (for industry and some NIH studies)

Details are available on the ["Worksheet for Submissions to R&D Committee \(Human Studies\)"](#) or at the VAMHCS R&D Committee office ([410-605-7000](tel:410-605-7000) x6506).

2 **Questions answered on 'Organizational Review Requirements' page:**

The research will be conducted by VA Investigators including PIs, Co-PIs, and Site Investigators on VA time (serving on compensated, WOC, or IPA appointments): **yes**

The research will utilize VA resources (e.g. equipment, funds, medical records, databases, tissues, etc.): **yes**

The research will be conducted on VA property, including space leased to and used by VA: **yes**

Questions answered on 'VA Prohibited Research' page:

The research is planned emergency research in subjects from whom consent can not be prospectively obtained: **no**

The study involves fetuses: **no**

- The study involves in vitro fertilization: **no**
- The research involves work with embryonic stem cells: **no**
- The study involves children AND is greater than minimal risk: **no**
- Recruitment phone calls involve asking veterans for their Social Security numbers: **no**

If the answers to these questions are wrong, use the Jump To menu to return to the 'Organization Review Requirements' page to change your answers.

- 3 *** Confirm** - You have read the above information and understand that in addition to this IRB application form (CICERO), you are required to send a submission to the VAMHCS R&D Committee **within 60 days of receiving IRB approval.**
 Yes No

ID: VIEW4E1C8F0D7B000
Name: v2_VA Review Required

View: v2_Summary of Required Reviews (other than IRB)

Summary of Required Reviews (other than IRB)

- 1 **Additional Committee Reviews** - Based on your responses to the previous questions, you have identified the following additional reviews. To complete or view these additional committees' forms, click on the links below or exit this application and click on the appropriate button on left side of this submission's webpage.

Name of Related Submission
This protocol has no related submissions (RSC, GCRC, IBC, etc)

- 2 **Required Department and Specialty Reviews** - Based on the PI's organization (department, division, etc.) affiliation and answers to previous questions (use of Cancer Center, etc.), the organizations listed below are required to review this application. These reviews are conducted online and no additional forms or steps by the study team are required.

Name of Organization	Review Status
Physical Therapy	Complete

ID: VIEW4E1C8D9AE4000
Name: v2_Summary of Required Reviews (other than IRB)

View: v2_Additional Documents

Additional Documents

- 1 **Upload all additional documents here:**

Name	Created	Modified Date
ISO Checklist	3/11/2015 11:48 AM	5/8/2015 12:46 PM
FDA_Product Classification_BXB_Class-1.pdf	3/9/2015 10:06 AM	3/9/2015 10:06 AM
FDA Status InMotion.pdf	3/9/2015 10:05 AM	3/9/2015 10:05 AM
Anklebot FDA registration & Device Listing.pdf	3/9/2015 10:05 AM	3/9/2015 10:05 AM
Evaluation to Sign Consent Form.doc	1/22/2015 12:01 PM	1/22/2015 12:01 PM

ID: VIEW4E0962513A000
Name: v2_Additional Documents

View: v2_Final Page of Application

Final Page of Application

You have reached the final page of this application. It is recommended that you click on the "Hide/Show Errors" link on the upper or lower breadcrumb row of this page. The "Hide/Show Errors" will do a search of your application, and highlight areas that are required or need to be completed prior to submitting.

By submitting this application, you are electronically routing the protocol for departmental scientific review and all other necessary reviews. According to information you have provided, this application will be routed to the following Departments for review prior to being forwarded to the IRB for review. These reviews are conducted online and no additional forms or steps by the study team are required.

Name of Organization	Review Status
Physical Therapy	Complete

Required Safety Committee Reviews - In addition to the IRB, the following committees must review this submission. Each additional committee has a separate online form that the study team will be required to fill out. All committee applications (IRB plus those listed here) must be completed properly before the 'package' of applications can be submitted. The team may complete these additional forms in any order or at any time prior to submission of the IRB Application. To complete or view these additional committees' forms, click on the links below or exit this application and click on the appropriate button on left side of this submission's Workspace.

Name of Related Submission
This protocol has no related submissions (RSC, GCRC, IBC, etc)

You may check the progress of your application at any time by returning to the Workspace of this submission. A detailed history, including notes, dates, and times of events, is provided to you for this purpose.

If a reviewer returns the application to you, you must address their concerns and resubmit the protocol for review to all designated departments. After all departments have reviewed the application, it will automatically be sent to the IRB for review. Changes made to the submission after its approval must be submitted as modifications.

Investigator Attestation

By submitting this application, I, the Principal Investigator (PI), certify that the information provided in this application is complete and correct. Research will be conducted according to the submission as described, only by the approved principal investigator and study team members.

In addition, I agree to the responsibilities of a PI, including:

- Obtaining informed consent (if applicable) from all subjects as outlined in the submission.
- Reporting new information to the IRB per the requirements of the Investigator Manual.
- Obtaining renewal of the protocol prior to the expiration of the approval period or halt all study activities upon study expiration.
- Accepting ultimate responsibility for the protection of the rights and welfare of human subjects, conduct of the study and the ethical performance of the project.
- Ensuring performance of all research activities by qualified personnel according to the IRB approved submission.
- Ensuring that research personnel have or will receive appropriate training.
- Ensuring no changes will be made in the research until approved by the IRB (except when necessary to eliminate apparent immediate hazards to subjects).

Click the "Finish" button and then click "Submit Application" in the submission Workspace.

ID: VIEW4E1B10C500000
Name: v2_Final Page of Application

View: IRB - Add a Team Member

Add a Team Member

- * Select Team Member:**
Susan Conroy
- Research Role:**
Sub-Investigator
- * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.**
 Yes No
- * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:**
 Yes No
- * Does this study team member have a financial interest related to this research?**
 Yes No
- * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:**
She is a doctoral trained physical therapist with 6 years experience at the Baltimore VAMC as a member of research teams engaged in rehabilitation robotics for persons with stroke and other neurological injuries.

View: IRB - Add a Team Member

Add a Team Member

- * Select Team Member:**
Laurence Magder
- Research Role:**
Sub-Investigator
- * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.**
 Yes No
- * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:**
 Yes No
- * Does this study team member have a financial interest related to this research?**
 Yes No
- * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:**
He is a professor in Epidemiology who has several years of experience providing statistical expertise and data management for clinical trials.

View: IRB - Add a Team Member

Add a Team Member

- * Select Team Member:**
Kate Flores
- Research Role:**
Research Team Member
- * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.**

Yes No

- 4 * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:
 Yes No
- 5 * Does this study team member have a financial interest related to this research?
 Yes No
- 6 * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:
 Kate Flores has 3 years experience conducting research as a research technologist at Johns Hopkins Center for Viral Hepatitis. She was recently hired at the Baltimore VA Medical Center and does possess knowledge of the local study sites

View: IRB - Add a Team Member

Add a Team Member

- 1 * Select Team Member:
 Richard Macko
- 2 Research Role:
 Sub-Investigator
- 3 * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.
 Yes No
- 4 * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:
 Yes No
- 5 * Does this study team member have a financial interest related to this research?
 Yes No
- 6 * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:
 Richard Macko is a neurologist specializing in cerebrovascular disorders and exercise rehabilitation to improve functional mobility and cardiovascular health in neurological disability conditions. He is Director of the Baltimore VA Exercise & Robotics Center of Excellence has many years of experience conducting research in the state of Maryland.

View: IRB - Add a Team Member

Add a Team Member

- 1 * Select Team Member:
 Jason Diaz
- 2 Research Role:
 Research Team Member
- 3 * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.
 Yes No
- 4 * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:
 Yes No
- 5 * Does this study team member have a financial interest related to this research?
 Yes No
- 6 * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:
 Has over 5 years experience conducting human subjects research in the area of exercise physiology and stroke rehabilitation both in North Carolina and the Greater Baltimore region. Has experience working successfully in a multicultural environment.

View: IRB - Add a Team Member

Add a Team Member

- 1 * Select Team Member:
 Anindo Roy
- 2 Research Role:
 Sub-Investigator

- 3 * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.
 Yes No
- 4 * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:
 Yes No
- 5 * Does this study team member have a financial interest related to this research?
 Yes No
- 6 * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:
He is a PhD .trained mechanical engineer and robotics specialist with 7 years experience conducting research within the Baltimore VA in the area of stroke rehabilitation and has strong awareness of cultural and social factors in our study population.

View: IRB - Add a Team Member

Add a Team Member

- 1 * Select Team Member:
Charlene Hafer-Macko
- 2 Research Role:
Sub-Investigator
- 3 * Edit Rights - Should this person be allowed full edit rights to the submission, including: editing the online forms and the ability to execute activities? Note - a person with edit rights will automatically be added to the CC list and will receive all emails regarding this protocol, even if the answer to #4 below is No.
 Yes No
- 4 * CC on Email Correspondence - Should this person be copied on all emails sent by the HRPO office to the PI/POC? Study team members with edit rights will automatically receive all emails:
 Yes No
- 5 * Does this study team member have a financial interest related to this research?
 Yes No
- 6 * Briefly describe experience conducting research and knowledge of the local study sites, culture, and society:
Stroke Neurologist in the Baltimore VAMC and University of Maryland School of Medicine, Department of Neurology. She is a principal investigator and has many years of experience working with patients with stroke.