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PROGRAM CONTACT:
Dana Plude

Release Date: **07/10/2019**

Revised Date:

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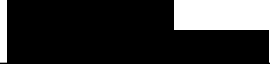
Application Number: **1 R43 AG063685-01A1**

Principal Investigator

SOBOL, ADAM

Applicant Organization: CAREBAND, INC.

Review Group:	**ZRG1 RPHB-Y (12)** **Center for Scientific Review Special Emphasis Panel** **Small Business: Psycho/Neuropathology Lifespan Development, STEM Education**

Meeting Date:	**06/27/2019**	*RFA/PA:*	**PAS18-187**
Council:	**AUG 2019**	*PCC:*	**2BCOGDP**
Requested Start:	**09/01/2019**		

Project Title:	**CareBand: Wearable Technology for People with Dementia**
SRG Action:	**Impact Score:29**
Next Steps:	**Visit https://grants.nih.gov/grants/next_steps.htm**
Human Subjects:	**30-Human subjects involved - Certified, no SRG concerns**
Animal Subjects:	**10-No live vertebrate animals involved for competing appl.**
Gender:	**1A-Both genders, scientifically acceptable**
Minority:	**1A-Minorities and non-minorities, scientifically acceptable**
Age:	**3A-No children included, scientifically acceptable**

Project Year	Direct Costs Requested	Estimated Total Cost
1	███████	███████
TOTAL	███████	███████

ADMINISTRATIVE BUDGET NOTE: The budget shown is the requested budget and has not been adjusted to reflect any recommendations made by reviewers. If an award is planned, the costs will be calculated by Institute grants management staff based on the recommendations outlined below in the COMMITTEE BUDGET RECOMMENDATIONS section.

1R43AG063685-01A1 Sobol, Adam

RESUME AND SUMMARY OF DISCUSSION: This highly significant resubmitted Phase I SBIR application proposes to develop a wearable technology that assesses agitated behavior expressed by people who have Alzheimer's disease and related dementias (ADRD). Reviewers unanimously agreed on the broad relevance for the proposed project and were enthusiastic about the technology's key innovations: collecting real-time indoor and outdoor location, movement, and activity data that if successful, would alert caregivers and allow them to intervene. The resubmitted application is highly responsive to comments from the prior review. The scientific premise of this well-written application is based on successful earlier versions of the technology, and the research strategy includes a thoughtful data collection plan and inclusion of both qualitative and quantitative data to validate the technology. The investigative team, led by principal investigator Adam Sobol, is highly qualified with well-rounded expertise to cover all project activities, and the environment at Careband Inc. is capable of carrying out the aims; however, given that a large portion of the project is conducted by outside contractors, concerns around project coordination and remote collaboration were raised. Another issue is around the ordering and prioritization of the aims, with Aim 3 considered to be of a higher priority than Aim 1. However, with regard to Aim 3, some reviewers expressed the view that the scientific premise around agitation as measured by these constructs as not sufficiently justified. At the end of the discussion, reviewers reached consensus on the strengths of the proposal, but weighted the importance of the weaknesses somewhat differently. Overall, the strengths outweigh the weaknesses, with the majority of reviewers assessing the predicted impact of the application on the field of agitation measurement in the high range.

DESCRIPTION (provided by applicant): An estimated 5.5 million Americans age 65 and older are living with Alzheimer's disease (AD) and as the population ages, this number is expected to rise to 13.8 million by 2050. Agitation is one of the most common and distressing neuropsychiatric symptoms of Alzheimer's disease and related dementias (ADRD) for patients in the ambulatory and long-term care (LTC) settings. Agitation contributes to increased healthcare costs, greater caregiver distress and worse quality of life. A significant challenge in the management of agitation is obtaining real-time objective data on symptom patterns. Symptom rating scales are time consuming and frequently underutilized by LTC staff. Such subjective differences in symptom reporting makes measurement of treatment response or non-response quite difficult. Clinicians, LTC staff and caregivers need a more cost effective, simple way to objectively measure agitation. While efforts have been made to capture agitation data using wireless sensors, none to date have been made commercially available. CareBand, an Illinois-based small business, is developing an end-to-end wearable technology and near real-time data platform for people living with ADRD. Preliminary studies have demonstrated CareBand's ability to provides real-time indoor and outdoor precise location, movement, and activity data. CareBand's system is passive, always on and does not require wi-fi or traditional cellular technology to send data to the secure HIPAA-compliant CareBand cloud. In Phase I, the PI and collaborating site, Bethany Village, will determine the feasibility and user acceptability of the device as well as the ability to correlate agitation scale data to that of CareBand's data. Aims: 1: Engineer power-efficient firmware to collect granular motion data within a given room or hallway (e.g. pacing) and to build cloud logic to analyze this granular data for web and mobile applications. 2: Determine the feasibility and usability of deployment of CareBand Technology to individuals with ADRD in LTC for a six-week period, and staff recording of observation-based, validated agitation scale data daily. 3: Explore the relationship between motion variable data, and validated agitation scale data. At the end of Phase I, CareBand will have implemented the CareBand technology in an LTC facility environment, received feedback on the hardware and software from end users, and assessed correlation of agitation with increased patient movement. Phase II efforts will focus on construction of algorithms informed by any findings of correlation, the creation of a predictive model around impending agitation, and a longitudinal study in multiple long-term care facilities serving individuals with ADRD. Phase II may also include adding heartrate sensors to the CareBand device for enhanced agitation measurements. A significant market

opportunity exists for the CareBand technology in alerting caregivers to early signs of agitated behavior in people living with dementia, allowing caregivers to intervene before the need for psychotropic medication or hospitalization. This preemptive intervention enhances quality of life for individuals living ADRD and decreases caregiver burden.

PUBLIC HEALTH RELEVANCE: Agitation is one of the most common and distressing neuropsychiatric symptoms (NPS) of Alzheimer's disease and related dementias (ADRD) for patients in the ambulatory and long-term care (LTC) settings. Agitation contributes to increased healthcare costs, greater caregiver distress and worse quality of life. A significant challenge in the management of agitation is obtaining real-time objective data on symptom patterns. CareBand is developing an end-to-end wearable technology and real-time data platform for people living with ADRD that will predict impending agitation in the ADRD patient population.

CRITIQUE 1

Significance: 1
Investigator(s): 1
Innovation: 1
Approach: 2
Environment: 1

Overall Impact: This is a 1-year, Phase 1 resubmission to refine a technology called CareBand and determine its feasibility and usability in an ADRD population and the respective staff members in a LTC setting. CareBand is a wearable motion-sensor technology to detect person-specific location, movement, and agitation (e.g., wandering) and allows monitoring of behavioral patterns. It has undergone multiple iterations of development with prior funding support and has several related patents. The team was responsive to the initial review comments. The current team has been expanded to include more relevant areas of expertise. There is a thoughtful plan of data collection from multiple perspectives to include patients, family members and staff. There is an effort to validate the technology with staff ratings (both quantitative and qualitative) and consider the added value of heart rate monitoring to the device. There is also thoughtful attention to firmware development for practical use and feasibility (e.g, battery performance). This is a well-written Phase 1 that represents an authentic partnership between an innovative small business entrepreneur and a strong team of relevant clinical and scientific experts in geriatric medicine, geriatric psychiatry and artificial intelligence to support dementia care. This technology has broad potential in different levels of care (nursing homes, dementia care in assisted living, and home caregivers). It also has the potential to provide useful information for staff managers and licensed care providers to better inform treatment decisions for those with ADRD and behavioral disturbance. Overall, this is a strong Phase 1 proposal focused on a significant topic with a thoughtful approach, with only minor weaknesses; thus, enthusiasm is high.

1. Significance:

Strengths

- Agitation is a common aspect of behavioral disturbance among those with dementia and it is distressing to families and caregivers and may interfere with care delivery.

- Long-term care providers don't routinely monitor and document the frequency and severity of agitation because it is difficult to track in care practice; thus, staff ratings are often subjective and inconsistent.

- An objective, wearable technology that automatically tracks agitation frequency and behavioral patterns (e.g., wandering) could be useful to determine the efficacy of treatment plans and the

targeting of behavioral management strategies to reduce the use of antipsychotic medications, as well as support earlier intervention.

Weaknesses

- The technology is limited to physical agitation, particularly wandering, and verbal agitation is also common among those with dementia and behavioral disturbance. Verbal agitation also tends to create more distress for families/caregivers (e.g., repetitive questions or phrases, yelling). However, these types of agitation often co-occur such that, if early signs of physical agitation are detected, this would support attention to verbal agitation symptoms as well.

- It is unclear if the technology and related algorithms can differentiate between healthy physical movement (e.g., ambulation, engagement in physical/social group activities) versus repetitive movement that is non-purposeful (e.g., physical agitation, wandering).

2. Investigator(s):

Strengths

- Excellent team with the necessary health informatics, software development, biomedical engineering, and clinical experience to implement this project.

- Adam Sobol CAREBAND, INC. PD/PI: Background in Informatics and Business; serves on the Post-Acute/Long-term Care Society Innovation Committee to bridge the gap between technology entrepreneurs and physician innovators. TEDx talk on technology and dementia.

- Ellen Kaehr M.D. Geriatrician, Indiana University Consultant, works clinically in post-acute and long-term care setting, currently serves as the Medical Director of Bethany Village.

- Daniel Bateman M.D., Geriatric Psychiatrist and Research Scientist, Indiana University Co-Investigator, primary research interests are studying and implementing innovative approaches to measuring and treating neuropsychiatric syndromes of dementia (NPS) through the leveraging of new and existing technologies.

- Todd Sobol M.D., Geriatrician, Senior Medical Director at Optum Complex Care Management (Advisor), clinical expertise in post-acute and long-term care settings.

- Shehroz Khan, machine-learning expert, Toronto Rehabilitation Institute, Consultant. Research focus on development of machine learning and deep learning algorithms for solving problems related to aging, rehabilitation and independent assisted living; currently leading an artificial intelligence team for a project on detecting incidents of agitation and aggression in people living with dementia.

- Andrea Iaboni M.D. Geriatric Psychiatrist and Clinician-Researcher in the Department of Psychiatry at the University of Toronto University Health Network (Advisor)

- Mohammadreza Faieghi PhD Biomedical Engineering, University Health Network (Consultant). Development of artificial intelligence and robotic solutions to monitor the health status of people with dementia.
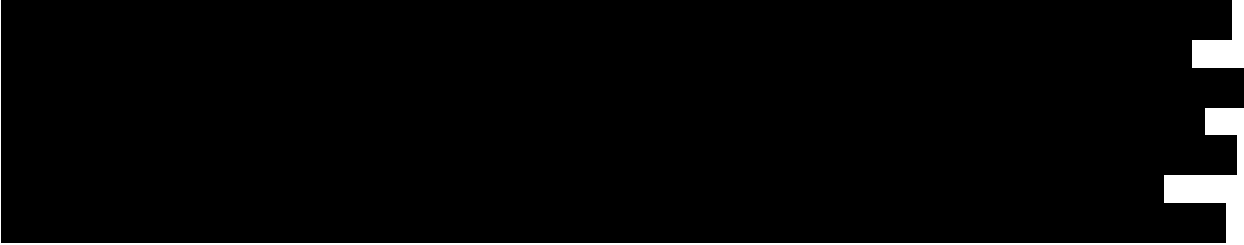
Weaknesses

- None noted.

3. Innovation:

Strengths

- System does not use WIFI or cellular technology, which many senior care homes do not have.

- Technology detects location, activity level and heart rate monitoring.

- Providing optimal care for people living with dementia requires continuous observation of small changes in patterns of activity and behavior in order to initiate proper treatment for changes in condition. The use of smart technology which tracks near real time movement and pattern analysis algorithms has significant potential to enable early detection and changes in behavior and activity.

- Potential for use in nursing homes (dementia care units), dementia care within residential care, and home caregiver settings.

- Designed to replace older "wanderguard" type systems to monitor wandering behaviors and keep those with ADRD from getting lost. These systems don't identify the specific person and their location.

- ███

- CareBand delivers clear and easy to understand dashboards and reports to easily and quickly convey the results of each patient's behavior.

- Extensive development of the technology through a series of various sources of funding, with a recent award of the winner of the 2018 AMDA Shark Tank. Several related patents.

Weaknesses

-

4. Approach:

Strengths

- Comparison of CareBand data with staff report of agitation and qualitative observations.

- Prior small studies have shown a correlation between agitation and activity levels – the proposed work would expand this work by testing a non-invasive, wearable technology and evaluate usability in a long-term care setting (Bethany Village).

- Firmware development for ease of use, battery performance and algorithms (granular motion data).

- Movement data will be collected with ADRD residents for 6-weeks along with staff ratings of agitation – Recruitment Goals: 15 residents (BIMS assessment of cognition); 15 staff for training and ratings.

- Objective heart rate monitors included in measurement – if proven useful, a HR monitor can be embedded in future design of CareBand.

- Focus groups to assess usability – Three groups will participate in the focus groups: patients in the study (30-minute sessions), family members (one to two hours), and participating staff (one to two hours).

Weaknesses

- When developing the related algorithms, it isn't clear how often data would need to be generated and/or reviewed by staff in order to be clinically useful. A simple graph of behavioral patterns throughout the day over the course of one week, for example, might be useful while a daily summary/real-time alerts might create "alert-fatigue" among staff.

- It isn't clear if devices are worn 24/7 and, thus, need to be water-resistant (for bathing/showering).

5. Environment:

Strengths

- CareBand is located in Chicago, Illinois and is a member of MATTER, a healthcare startup incubator operating out of Merchandise Mart in downtown Chicago. MATTER occupies 25,000 square feet in Chicago's Merchandise Mart.
- Healthcare Partners: (Bethany Village) 100-bed nursing home with 26-bed memory care unit; a senior healthcare and rehabilitation service company (ASC); Health & Hospital Corporation (owner and operator of Bethany plus 78 other facilities).
- Academic Partners: Indiana University Purdue University Indianapolis (IUPUI), Indiana University Center for Aging Research (IUCAR); Regenstrief Institute, Inc.; Indiana University School of Medicine (IUSM), Departments of Psychiatry, Geriatrics; Indiana Alzheimer's Disease Center

Weaknesses

- None noted.

Study Timeline:

Strengths

- Acceptable

Weaknesses

-

Protections for Human Subjects:

Acceptable Risks and Adequate Protections

Data and Safety Monitoring Plan (Applicable for Clinical Trials Only):

Not Applicable (No Clinical Trials)

Inclusion Plans:

- Sex/Gender: Distribution justified scientifically
- Race/Ethnicity: Distribution justified scientifically
- For NIH-Defined Phase III trials, Plans for valid design and analysis: Not applicable
- Inclusion/Exclusion Based on Age: Distribution justified scientifically
- May need to create separate enrollment tables for residents versus staff.

Vertebrate Animals:

Not Applicable (No Vertebrate Animals)

Biohazards:

Not Applicable (No Biohazards)

Resubmission:

- Responsive to initial review comments.

Resource Sharing Plans:

Acceptable

Budget and Period of Support:

Recommend as Requested

CRITIQUE 2

Significance: 4
Investigator(s): 3
Innovation: 3
Approach: 5
Environment: 3

Overall Impact: Over 5 million Americans live with Alzheimer's and related dementia (ADRD). Agitation is a common symptom among this population, the care of which increases healthcare costs and lack of timely intervention leads to poor quality of life. This Phase I application repurposes an existing wearable prototype, designed for movement monitoring in this target population, to monitor and perhaps even predict agitation incidences among ADRD subjects living in assisted care facilities. If successful, an unobtrusive wearable device such as this one could be of significant value in assisting caregivers provide timely interventions to manage agitation. Several factors, however, temper this reviewer's enthusiasm for this project. The process by which the most significant goal of this application -- i.e., demonstration of movement data ability to monitor/predict agitation outcomes -- will be achieved is not clearly articulated. Heavy reliance, at an early stage, on outsourced personnel gives one pause with regard to the team's ability to succeed in longer term project planning and execution. While the application addresses previous reviewer concerns, some significant ones remain. These factors place the significance of this project in the mid to low range.

1. Significance:

Strengths

- With over 5 million Americans living with Alzheimer's, timely management of agitation could lead to lower healthcare costs and better quality of life for the patients.

- Current agitation assessment tools are typically retrospective, subjective, and rely on secondhand information to complete. An objective assessment tool that utilizes unobtrusive wearables could promote reliable, timely intervention and, perhaps, even allow prediction of agitation onset.

Weaknesses

- While the resubmissions addresses several of the concerns raised by the previous reviewers, some significant ones remain. The project is predicated on the critical hypothesis of correlating

(and predicting) agitation from movement data. The achievement of this is via Aim 3, the relevant section being hampered by a lack of detail.

- Significant portions of the work is to be contracted out. This heavy reliance on third-party development was a concern in the previous round and it hasn't been materially altered in this application. The addition of a machine learning expert, aiming to remedy a previous concern, is necessary, but still relies on outsourced personnel.

- Commercialization efforts, successes, and learnings from their current device that is addressed to the same market (elders in assisted living care, suffering from dementia) could have shed light on the likelihood of commercial success of the proposed functionality (agitation detection and prediction).

- Existing competitors to Careband are briefly mentioned; but the competition's capabilities and how Careband differs are not elucidated.

2. Investigator(s):

Strengths

- The assembled team has the requisite hardware, firmware, clinical, and ML expertise.

Weaknesses

- Heavy reliance on outsourced personnel and resources could hamper planning and efficient execution at this early stage.

3. Innovation:

Strengths

- Usage of long range (LoRa) devices, not reliant on cellular signals, and fit for indoor movement detection and location tracking purposes, repurposed to movement and agitation tracking/prediction is novel.

- Usage of unobtrusive wearables to achieve behavior detection among the potentially tech unsavvy elderly population is certainly appealing.

Weaknesses

- Under Innovation, the authors state their 'belief' that the combination of movement detection and heart rate data (from another wearable device) can lead to the ability to monitor and predict agitation. While plausible, this belief is not well founded in prior evidence.

4. Approach:

Strengths

- Quantifiable milestones and alternative strategies have been included for each of the specific aims, addressing previous concerns.

- The authors' deep knowledge of the hardware milieu allows them to repurpose the existing CareBand prototype, with minimal risks, to monitor agitation.

Weaknesses

- While this reviewer is sympathetic to the authors' desire to address previous concerns, vis a vis, battery efficiency of the wearable, optimizing battery usage seems like an unlikely candidate for Aim 1 of this application.

- This application aims to demonstrate acceptability of the technology (Aim 2) among its target (elderly with dementia) population; the authors, however, do not provide any information regarding potential user acceptability tests they have conducted to date – formal or informal – as it pertains to their current prototype device, which, physically will not be different from the one they will use for the agitation monitoring.

- The critical hypothesis to be proven for this product to be viable is the demonstration of monitoring and prediction of agitation from movement data gleaned from the wearable. If that goal is not achieved in a satisfactory sense, what is the point of demonstrating superior battery life? The organization of the specific aims, thus, seems less than optimal.

- Aim 3 seeks to explore the relationship between motion data and agitation scale data. It was hard for this reviewer to understand the proposed pathway to achieving this, admittedly complex, task – one of building a regressor, using the most discriminatory set of input variables. A regressor to predict the agitation score (PAS)? This was not well articulated. In their quest to 'design' a lot of these features, some attention could have been paid to 'learning' these features automatically via deep learning.

5. Environment:

Strengths

- The existing environment and resources are suitable for execution of this Phase I effort.

Weaknesses

- Previous reviews noted lack of clarity in description of needed hardware development and testing resources. This has not been addressed satisfactorily in this application.

Study Timeline:

Strengths

- Does not involve a clinical trial.

Weaknesses

- None noted

Protections for Human Subjects:

Acceptable Risks and Adequate Protections

- No concerns noted.

Data and Safety Monitoring Plan (Applicable for Clinical Trials Only):

Not Applicable (No Clinical Trials)

Inclusion Plans:

- Sex/Gender: Distribution justified scientifically

- Race/Ethnicity: Distribution justified scientifically

- For NIH-Defined Phase III trials, Plans for valid design and analysis: Not applicable

- Inclusion/Exclusion Based on Age: Distribution not justified scientifically

- Inclusion plan acceptable.

Vertebrate Animals:

Not Applicable (No Vertebrate Animals)

Biohazards:

Not Applicable (No Biohazards)

Resubmission:

- The applicant has made efforts to address previous reviewer concerns. Several concerns, and new ones, remain.

Resource Sharing Plans:

Acceptable

- Applicant will not share proprietary components of the product. But will share scientific results.

Budget and Period of Support:

Recommend as Requested

CRITIQUE 3

Significance: 2
Investigator(s): 2
Innovation: 2
Approach: 3
Environment: 2

Overall Impact: This Phase I SBIR resubmission proposes to develop CareBand, a technology designed to assess agitation in individuals with Alzheimer's disease and related dementias (ADRD) who reside in residential care environments. This is a significant issue, and earlier detection of symptom escalation may lead to improved patient outcomes. There is a strong scientific premise for the proposed work and the proposal is strengthened by the prototype the PI has developed and piloted with preliminary data. While the PI's research experience is limited, the team has been strengthened, is well-qualified and the consultants provide additional clinical expertise. The site and processes, including consent, for data collection are well defined, with improved milestones and outcomes. The product is innovative, utilizing current IoT features to collect and process multiple streams of data to make predictions of clinical state. The proposal provides a well thought-through commercialization plan, with additional supports for business plan development and commercialization. There is a moderate to high potential for commercialization across a number of care environments and end users. Weaknesses include challenges with measurement of agitation and collation with CareBand data, ideas for sophisticated data analysis, team fragmentation, and reliance upon outsourcing and third-party solutions for engineering efforts. In summary, this resubmission represents a high reward proposal with low to moderate risk.

1. Significance:

Strengths

- Agitation is a common psychiatric symptom in ADRD and is distressing for patients and caregivers.

- Well-supported scientific premise with citations and rationale regarding the need for better determination of agitation levels in ADRD patients, in addition to past studies on agitation and activity correlation.

- Potential for increased understanding of the relationship between agitation and sensor data (patient movement).

- Product may help to identify early signs of agitation and alert caregivers to take pre-emptive measures.

- Commercial potential for skilled nursing facilities (SNF), memory care, and assisted living facilities.

Weaknesses

- Minimal survey on existing solutions and approaches.

2. Investigator(s):

Strengths

- PI has demonstrated expertise in software engineering and cybersecurity with multiple patent applications for wireless devices and tracking systems.

- Professor from Indiana University School of Medicine will provide clinical expertise as co-investigator.

- Consultants will assist with firmware, hardware development, and other technical tasks, with addition of Dr. Khan as a co-investigator.

Weaknesses

- No past research support.

3. Innovation:

Strengths

- This technology detects location, activity level and the potential to collect heart rate.

- Given the challenges of documenting agitation, automated data collection and analysis that can predict or augment current ways of measuring agitation are potential innovations.

- This innovation has strong potential for use in assisted living facilities, nursing homes and locations of residential care.

- There is also strong potential for additional types of activity tracking, including: fall risk associated with toileting, time spent in different locations within a care setting, etc.

Weaknesses

- There is not currently a strong body of research that informs the multimodal data collection presented.

4. Approach:

Strengths

- Existing prototype of the device.

- Preliminary data demonstrates capability to track location and movement in a particular area

- Research plan is well designed and includes the development of granular motion data collection and tests with end users, in order to determine usability, and evaluate agitation detection.

- Scientific rigor is improved. The application outlines methods, collected data, and analyses.

Weaknesses

- Milestones for adequate battery life are present but remain an unknown that may affect system performance.

- Aim 3 data imputation may obscure real-world relationships between the device and current quantification of agitation measures.

5. Environment:

Strengths

- Facilities and resources at CareBand appear adequate for the development and evaluation of the proposed system.

- LoSs indicate adequate source for ADRD population (Bethany Village), subject recruitment and third-party development.

- Connection to incubator demonstrates increased likelihood of commercialization.

Weaknesses

- There are some risks associated with largely 3rd party development of the product.

Study Timeline:

Strengths

- Two months for completion of statistical analysis is realistic, as are the four months designated for data collection.

Weaknesses

- There is overlap between firmware and API optimization and data collection.

Protections for Human Subjects:

Acceptable Risks and Adequate Protections

- Human Subject Protection plan appears appropriate

Data and Safety Monitoring Plan (Applicable for Clinical Trials Only):

Not Applicable (No Clinical Trials)

Inclusion Plans:

- Sex/Gender: Distribution justified scientifically

- Race/Ethnicity: Distribution justified scientifically

- For NIH-Defined Phase III trials, Plans for valid design and analysis: Not applicable

- Inclusion/Exclusion Based on Age: Distribution justified scientifically

- Inclusion of Women and Minorities is based on demographics of study location. Children are excluded given the ADRD patients.

Vertebrate Animals:

Not Applicable (No Vertebrate Animals)

Biohazards:

Not Applicable (No Biohazards)

Resubmission:

- This resubmission addresses many of the reviewer concerns noted in the original review, including strengthening of the investigatory team, a more detailed description of the scientific approach, including milestones, aims, and contingencies, improvements in the data collection plan, and more explanation of data-based measures of agitation.

Resource Sharing Plans:

Not Applicable (No Relevant Resources)

Budget and Period of Support:

Recommend as Requested

THE FOLLOWING SECTIONS WERE PREPARED BY THE SCIENTIFIC REVIEW OFFICER TO SUMMARIZE THE OUTCOME OF DISCUSSIONS OF THE REVIEW COMMITTEE, OR REVIEWERS' WRITTEN CRITIQUES, ON THE FOLLOWING ISSUES:

PROTECTION OF HUMAN SUBJECTS: ACCEPTABLE

INCLUSION OF WOMEN PLAN: ACCEPTABLE

INCLUSION OF MINORITIES PLAN: ACCEPTABLE

INCLUSION ACROSS THE LIFESPAN PLAN: ACCEPTABLE

COMMITTEE BUDGET RECOMMENDATIONS: The budget was recommended as requested.

Footnotes for 1 R43 AG063685-01A1; PI Name: Sobol, Adam

NIH has modified its policy regarding the receipt of resubmissions (amended applications). See Guide Notice NOT-OD-14-074 at http://grants.nih.gov/grants/guide/notice-files/NOT-OD-14-074.html. The impact/priority score is calculated after discussion of an application by averaging the overall scores (1-9) given by all voting reviewers on the committee and multiplying by 10. The criterion scores are submitted prior to the meeting by the individual reviewers assigned to an application, and are not discussed specifically at the review meeting

or calculated into the overall impact score. Some applications also receive a percentile ranking. For details on the review process, see http://grants.nih.gov/grants/peer_review_process.htm#scoring.

MEETING ROSTER

Center for Scientific Review Special Emphasis Panel
CENTER FOR SCIENTIFIC REVIEW
Small Business: Psycho/Neuropathology Lifespan Development, STEM Education
ZRG1 RPHB-Y (12)
06/27/2019 - 06/28/2019

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DEPARTMENT OF LEARNING AND INSTRUCTION
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UNIVERSITY AT BUFFALO

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OREGON HEALTH AND SCIENCE UNIVERSITY

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SENIOR SCIENTIST
OLIN NEUROPSYCHIATRY RESEARCH CENTER
THE INSTITUTE OF LIVING AT HARTFORD HOSPITAL

CICHY, KELLY E, PHD
ASSOCIATE PROFESSOR
DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY
STUDIES
KENT STATE UNIVERSITY AT KENT

CONNOR, CAROL MCDONALD, PHD
CHANCELLOR'S PROFESSOR
SCHOOL OF EDUCATION
UNIVERSITY OF CALIFORNIA IRVINE

EDWARDS, ANNE B
ASSOCIATE PROFESSOR
DEPARTMENT OF BEHAVIOTAL SCIENCE
PURDUE UNIVERSITY NORTHWEST, CALUMET CAMPUS

FAUTH, ELIZABETH BRAUNGART, PHD
ASSOCIATE PROFESSOR
DEPARTMENT OF HUMAN DEVELOPMENT AND FAMILY
STUDIES
UTAH STATE UNIVERSITY

GOLDHOR, RICHARD S., PHD
SENIOR RESEARCH FELLOW
SPEECH TECHNOLOGY
AND APPLIED RESEARCH CORPORATION

GRUBER-BALDINI, ANN L, PHD
PROFESSOR
EPIDEMIOLOGY AND PUBLIC HEALTH, GERNOTOLOGY
UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE

HOPPER, CHRIS A, PHD
PROFESSOR
DEPARTMENT OF KINESIOLOGY
HUMBOLDT STATE UNIVERSITY

HOROWITZ, JUNE ANDREWS, PHD
PROFESSOR AND ASSOCIATE DEAN GRADUATE
PROGRAMS AND RESEARCH
COLLEGE OF NURSING
UNIVERSITY OF MASSACHUSETTS DARTMOUTH

JAKOBOVITS, REX M, PHD
PRESIDENT
EXPERIAD, LLC
██████████████

KAJIYAMA, BRUNO
CEO
PHOTOZIG, INC
██████████████

LAKES, KIMBERLEY DAWN, PHD
ASSOCIATE PROFESSOR
DEPARTMENT OF PSYCHIATRY AND NEUROSCIENCE
SCHOOL OF MEDICINE
UNIVERSITY OF CALIFORNIA, RIVERSIDE
██████████

MERLIN, LISA R, MD
DISTINGUISHED PROFESSOR
DEPARTMENT OF NEUROLOGY AND PHYSIOLOGY
PHARMACOLOGY
COLLEGE OF MEDICINE
SUNY DOWNSTATE MEDICAL CENTER
██████████████

MEUSER, THOMAS MICHAEL, PHD
PROFESSOR OF SOCIAL WORK
CENTER FOR EXCELLENCE IN AGING AND HEALTH
UNIVERSITY OF NEW ENGLAND
██████████████

MINEO, BETH A, PHD
ASSOCIATE PROFESSOR AND DIRECTOR
CENTER FOR DISABILITIES STUDIES
SCHOOL OF EDUCATION
UNIVERSITY OF DELAWARE
██████████

MODAYUR, BHARATH, PHD
PRESIDENT
EARLY MARKERS
██████████

MORRILL, ALLISON C, PHD
RETIRED ASSOCIATE DEAN FOR RESEARCH
UNIVERSITY OF NEW ENGLAND
██████████

O'BRIEN, LOUISE M, PHD
ASSOCIATE PROFESSOR
DEPARTMENT OF NEUROLOGY
UNIVERSITY OF MICHIGAN
██████████

PATRIQUIN, MICHELLE ANNE, PHD
ASSISTANT PROFESSOR
DEPARTMENT OF PSYCHIATRY AND BEHAVIORAL
SCIENCES
BAYLOR COLLEGE OF MEDICINE
██████████████

PEIRCE, JESSICA M, PHD
ASSOCIATE PROFESSOR
DEPARTMENT OF PSYCHIATRY AND BEHAVIORAL
SCIENCES
JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE
██████████████

PILKAR, RAKESH, PHD
RESEARCH SCIENTIST
CENTER FOR MOBILITY AND REHABILITATION
ENGINEERING RESEARCH
KESSLER FOUNDATION, INC.
██████████████

SEARS, LONNIE L, PHD
PROFESSOR
DEPARTMENT OF PEDIATRICS
UNIVERSITY OF LOUISVILLE
██████████

SHUNE, SAMANTHA EVE, PHD
ASSISTANT PROFESSOR
COMMUNICATION DISORDERS AND SCIENCES
UNIVERSITY OF OREGON
██████████

SIMMONS, SANDRA F, PHD
RESEARCH SCIENTIST
TENNESSEE VALLEY HEALTHCARE SYSTEM, GRECC
DEPARTMENT OF MEDICINE
INSTITUTE OF MEDICINE AND PUBLIC HEALTH
CENTER FOR QUALITY AGING
██████████████

SLEP, AMY MICHELE SMITH, PHD
PROFESSOR
DEPARTMENT OF CARIOLOGY AND COMPREHENSIVE CARE
COLLEGE OF DENTISTRY
NEW YORK UNIVERSITY
██████████████

STARK, SUSAN LYNN, PHD
ASSOCIATE PROFESSOR
OCCUPATIONAL THERAPY AND NEUROLOGY
WASHINGTON UNIVERSITY SCHOOL OF MEDICINE
██████████████

TANGALOS, ERIC G, MD
PROFESSOR
DIVISION OF COMMUNITY INTERNAL MEDICINE
MAYO CLINIC
██████████████

TUERK, PETER, PHD
RESEARCH DIRECTOR
DEPARTMENT OF HUMAN SERVICES
UNIVERSITY OF VIRGINIA
██████████████████

WALLHAGEN, MARGARET INGRID, PHD
PROFESSOR
DEPARTMENT OF PHYSIOLOGICAL NURSING
SCHOOL OF NURSING
UNIVERSITY OF CALIFORNIA SAN FRANCISCO
██████████████████

WHITE, BARBARA SCHWITZ
ASSOCIATE PROFESSOR EMERITA
LIFELONG LEARNING INSTITUTE
DEPARTMENT OF NURSING
COLLEGE OF HEALTH AND HUMAN SERVICES
CALIFORNIA STATE UNIVERSITY LONG BEACH
████████████████

WYSS, J MICHAEL, PHD
PROFESSOR
DEPARTMENT OF NEUROBIOLOGY
SCHOOL OF MEDICINE
UNIVERSITY OF ALABAMA AT BIRMINGHAM
████████████████

ZANJANI, FAIKA, PHD
ASSOCIATE DIRECTOR OF ACADEMIC PROGRAMS &
RESEARCH TRAINING
DEPARTMENT OF GERONTOLOGY
VIRGINIA COMMONWEALTH UNIVERSITY
████████████████

SCIENTIFIC REVIEW OFFICER
FEMIA, ELIA E, PHD
SCIENTIFIC REVIEW OFFICER
CENTER FOR SCIENTIFIC REVIEW
NATIONAL INSTITUTES OF HEALTH
████████████████

EXTRAMURAL SUPPORT ASSISTANT
FAYEMIWO, TOLU
EXTRAMURAL SUPPORT ASSISTANT
CENTER FOR SCIENTIFIC REVIIEW
NATIONAL INSTITUTES OF HEALTH
████████████████

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