

AWARD NUMBER: W81XWH-20-1-0756

TITLE: Supporting Caregivers of Veterans with TBI and Mixed Dementia: The REACH Hope Behavioral Intervention

PRINCIPAL INVESTIGATOR: Linda Nichols, PhD

CONTRACTING ORGANIZATION: Research Inc/VA Medical Center (11h) 1030  
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Memphis, TN 38104

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Fort Detrick, Maryland 21702-5012

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# REPORT DOCUMENTATION PAGE

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<b>13. SUPPLEMENTARY NOTES</b>					
<b>14. ABSTRACT</b> Family members who care for Veterans with post traumatic brain injury (TBI) dementia often have heavy burden. Currently, there is no caregiving intervention that combines one-on-one coaching with digital flexibility for caregivers of Veterans with both TBI and dementia. The Department of Veterans Affairs (VA) national Caregiver Center and Virginia Commonwealth University have developed and are evaluating a one-on-one plus smartphone-based intervention, REACH Hope. REACH Hope combines two award-winning interventions: the VA's REACH VA (Resources for Enhancing All Caregivers Health) one-on-one behavioral caregiving intervention and the Department of Defense's Virtual Hope Box mobile app. The REACH VA component involves training in problem-solving and stress management skills one-on-one from a coach. The customizable Hope Box app provides anytime access to personalized coping and stress reduction content. This randomized clinical trial is testing the ability of REACH Hope to improve caregivers' burden, depression and anxiety, and confidence in themselves as caregivers, as well as Veteran safety. In a wait-list control design, half of 110 caregivers of Veterans with TBI and dementia receive REACH Hope at the beginning of the study and half after three months. Outcomes are measured at the start of the study, 3 months, 6-months for all participants, and 9-months later for wait list control participants.					
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## 1. INTRODUCTION:

Family members who care for Veterans with both traumatic brain injury (TBI) and dementia often have heavy burden. Currently, there is no caregiving intervention that combines the strengths of one-on-one coaching with digital flexibility. In addition, there are no interventions for caregivers of Veterans with both TBI and dementia. The Department of Veterans Affairs (VA) national Caregiver Center and Virginia Commonwealth University have developed and are evaluating a one-on-one plus smartphone-based intervention, REACH Hope. REACH Hope combines two award-winning interventions: the VA's REACH VA (Resources for Enhancing All Caregivers Health) one-on-one behavioral caregiving intervention and the Department of Defense's Virtual Hope Box mobile app. The REACH VA component involves training in problem-solving and stress management skills one-on-one from a coach. The customizable Hope Box app provides anytime access to personalized coping and stress reduction content. This randomized clinical trial is testing the ability of REACH Hope to improve caregivers' burden, depression and anxiety, and confidence in themselves as caregivers, as well as Veteran safety. In a wait-list control design, half of 110 caregivers of Veterans with TBI and dementia receive REACH Hope at the beginning of the study and half after three months. Outcomes are measured at the start of the study, 3 months, 6-months for all participants, and 9-months later for wait list control participants.

2. **KEYWORDS:** *Provide a brief list of keywords (limit to 20 words).*

Brain injuries, Traumatic  
Dementia  
Caregivers  
Veterans  
Military Family  
Mobile applications

## 3. ACCOMPLISHMENTS:

What were the major goals of the project?

Goals	Timeline	Dates	Dates and Year 1 % Completed
<b>Major Task 1: Prepare Regulatory Documents</b>	Months		
<i>Milestone Achieved: Local IRB Approval, Memphis, VCU</i>	4	Nov-2021	100%, Memphis 26-Mar-2020 VCU 17-Jul-2020
<i>Milestone Achieved: HRPO Approval</i>	6	Jan-2021	100%, 30-Nov-2020
<i>Milestone Achieved: Local IRB and HRPO Approval as needed and yearly</i>	4-36	Nov-2021 - Aug-2023	Memphis continuing review 26-Jan-2022 VCU continuing review – change in site PI so new approval 2-Aug-2022. HRPO continuing review 2-Feb-2022
<b>Major Task 2: Train Study Staff</b>	Months		
<i>Milestone(s) Achieved: Staff hired</i>	1-6	Aug-2020- Jan-2021	100%, (staff hired 10-Jun-2021; (replacement staff hired 1-Jul-2022)
<i>Milestone(s) Achieved: Staff trained, certified</i>	2-9	Sep-2020- Apr-2021	100%, 28-Jun-2021 (replacement staff hired 1-Jul- 2022)
<i>Milestone Achieved: Maintained trained and certified Staff throughout study</i>	2-36	Sep-2020-- Aug-2023	Ongoing
<b>Major Task 3: Finalize Research Protocol/Manual of Operations (MOP)</b>	Months		
<i>Milestone(s) Achieved: REACH Hope Program Coach Manual with format, topics and scripts</i>	8-9	Mar-2021- Apr-2021	100%, 02-Feb-2021
<i>Milestone(s) Achieved: Caregiver Notebooks</i>	8-9	Mar-2021- Apr-2021	100%, 09-Feb-2021
<i>Milestone(s) Achieved: Data collection forms, scripts, and documentation</i>	8-9	Mar-2021- Apr-2021	100%, 31-Jan-2021
<b>Major Task 4: Screening and Recruitment</b>	Months		
<i>Milestone(s) Achieved: Screening forms and scripts</i>	6	Jan-2021	100%, 01-Jul-2020
<i>Milestone(s) Achieved: Brochures, web site, social media blurbs</i>	6	Jan-2021	100%, Website live 16-Jan-2021; Brochures mailed 15-Feb-2021; no social media yet

Goals	Timeline	Dates	Dates and Year 1 % Completed
<i>Milestone(s) Achieved: Approximately 250 participants screened</i>	27	Nov-2022	38.8% screened (n=97), first person screened 18-Feb-2021
<i>Milestone(s) Achieved: 111 participants recruited</i>	27	Nov-2022	66.3% (n=73)
<b>Major Task 5: Randomization and Intervention Delivery</b>	Months		
<i>Milestone(s) Achieved: 111 participants randomized</i>	27	Nov-2022	66.3% (n=73) enrolled and randomized, first person enrolled 25-Mar-2021
<i>Milestone(s) Achieved: Completed interventions</i>	9-30	Apr-2021-Feb-2023	58.2% (n=64) completed
<b>Major Task 6: Data Collection/Data Entry</b>	Months		
<i>Milestone Achieved: Data collection (385 total interviews)</i>	9-33	Apr-2021-May-2023	48.8% (n=188), first data collected 25-Mar-2021
<i>Milestone Achieved: Data entry, quality</i>	35	Jul-2023	48.8% (n=188)
<b>Major Task 7: Data Analysis</b>	Months		
<i>Milestone(s) Achieved: Data analysis</i>	36	Aug-2023	Not yet begun
<b>Major Task 8: Preparation and Dissemination of Results</b>	Months		
<i>Milestone(s) Achieved: Papers and Presentations</i>	28-36	Dec-2022-Aug-2023	CDMRP IPR presentation 20-Aug-2021 Rehabilitation Psychology Annual Meeting, Louisville, KY, 17-20-Feb-2022
<i>Milestone(s) Achieved: Manuals and materials and plan for dissemination</i>	36	Aug-2023	Not yet begun

### What was accomplished under these goals?

#### 1) Major activities

- Continued to update regulatory approval
- Hired and trained additional replacement staff
- Continued recruitment
- Continued data collection
- Continued intervention delivery

#### 2) Specific objectives

- Aim 1 completed: Modify/refine the REACH Hope intervention and caregiver materials for caregivers of Veterans with TBI and AD/MD, in conjunction with subject matter experts (SMEs).

#### 3) Significant results

- Nothing to report

#### 4) Other achievements

- See Products below

### What opportunities for training and professional development has the project provided?

- Nothing to report.

### How were the results disseminated to communities of interest?

- Two presentations on study progress and protocol

### What do you plan to do during the next reporting period to accomplish the goals?

- Continue recruitment
- Continue to provide intervention
- Continue to collect data
- Continue treatment fidelity checks, interventionist coaching, and data quality control

#### 4. IMPACT::

##### What was the impact on the development of the principal discipline(s) of the project?

- No outcomes yet. However, planned submission of grant to Department of Defense Traumatic Brain Injury and Psychological Health Research Program (TBIPHRP) – all 5 VA Polytrauma TBI Model Systems – Richmond, Minneapolis, Palo Alto, Tampa, and San Antonio, as well as Caregiver Support Program's Caregiver Center at Memphis. Project will explore implementation of REACH for caregivers of Veterans with TB.

##### What was the impact on other disciplines?

- Nothing to report

##### What was the impact on technology transfer?

- Nothing to report

##### What was the impact on society beyond science and technology?

- Nothing to report

#### 5. CHANGES/PROBLEMS:

:

##### Changes in approach and reasons for change

- Difficulty recruiting – included caregivers of non-Veterans from VCU for recruitment
- Study co-PI Paul Perrin moved to University of Virginia from Virginia Commonwealth University 10-Aug-2022; this will necessitate a change in funding to UVA from Research Inc at Memphis VAMC and Ron Seel, VCU co-I becoming VCU site PI

##### Actual or anticipated problems or delays and actions or plans to resolve them

- Problem: Recruitment has slowed down  
Solution  
With permission of CDMRP Science Officer, included caregivers of non-Veterans from Virginia Commonwealth University in recruitment  
Changed consent form and amended study at both sites
- Problem: Caregiver difficulty downloading Hope Box app  
Solutions:  
Reported to DoD  
VA may take over the Hope Box app

##### Changes that had a significant impact on expenditures

- Delay in VCU invoices

##### Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents

- Nothing to report

##### Significant changes in use or care of human subjects

- Nothing to report
- Memphis VAMC IRB approval - 26-Mar-2020, Memphis continuing review – 07-Jan-2021
- VCU IRB approval - 17-Jul-2020, VCU continuing review – change in site PI so new approval 2-Aug-2022.

#### 6. PRODUCTS:

##### Publications, conference papers, and presentations

- CDMRP IPR presentation presented August 20, 2021 (included in Year 1 Annual Report)

- Tyler, C.M., Ohayagha, C., MacPherson, A.R., Ulbing, A., Nichols, L.O., Perrin, P.B., Martindale-Adams, J.L., Clark, C., Martin, J.R., Zuber, J.K., Seel, R.T., & Perera, R.A. (2022, February). *Supporting caregivers of veterans with TBI and mixed dementia: The REACH Hope Behavioral Intervention*. [Poster presentation]. 24th Annual Rehabilitation Psychology Conference, Louisville, Kentucky. 17-20-Feb-2022

### Journal publications.

- Nothing to report

### Books or other non-periodical, one-time publications.

- Nothing to report

### Other publications, conference papers, and presentations

- Nothing to report

### Website(s) or other Internet site(s)

- REACH Hope site - [https://www.memphis.va.gov/MEMPHIS/features/Memphis\\_researchers.asp](https://www.memphis.va.gov/MEMPHIS/features/Memphis_researchers.asp)
- YouTube Hope Box videos - <https://www.youtube.com/channel/UCT01GHq08qma66gZKYdOuCQ/videos>

### Technologies or techniques

- Expanded Hope Box User's Guide has been developed and shared with Department of Defense developers of Hope Box app

### Inventions, patent applications, and/or licenses

- Nothing to report

### Other Products

- **REACH Hope Caregiver Notebook** – an easy-to-use resource with 28 short chapters on managing behaviors and 16 chapters on reducing stress and burden

#### Behavioral Chapters

An Overview of TBI and Dementia  
 Activities  
 Bathing  
 Combativeness  
 Communicating with a Person with TBI and Dementia  
 Confusion  
 Dressing  
 Driving  
 Early-Stage Dementia  
 Eating  
 Environment  
 Hallucinations and Delusions  
 Hospitalization  
 Incontinence  
 Lifting and Moving  
 Medications  
 PTSD, TBI, and Dementia  
 Repeated Questions  
 Safety Concerns  
 Sexuality  
 Shadowing  
 Sleeping  
 Sundowning  
 Telling Your Loved One and Others

#### Caregiving Chapters

Addressing Problems  
 Adult Day Care  
 Asking for Help  
 Challenging Emotions  
 Communicating with Health Care Providers  
 Communicating with Others  
 Depression  
 Feelings  
 Financial and Legal Concerns  
 Grief  
 Healthy Lifestyle  
 Holidays  
 Mood Management  
 Navigating the System  
 Organizing Your Caregiving Life  
 Sexuality  
 Stress Management  
 Taking Care of You

Traveling  
Understanding and Managing Anger  
Visiting  
Wandering

- **Hope Box Users Guide** – screen shots and detailed descriptions for installation and use for Android and iPhone
- **Twelve REACH Hope YouTube videos** – that caregivers can download into their personalized Hope Box app)  
link to all videos: <https://www.youtube.com/channel/UCT01GHg08qma66gZKYdOuCQ/videos>
  - Content videos
    - REACH Stretching Video – [https://youtu.be/pti5Ty1\\_kUU](https://youtu.be/pti5Ty1_kUU)
    - REACH Conflict Resolution Video – <https://youtu.be/AU9JHdAVHtc>
    - REACH Self-Esteem Video - <https://youtu.be/-1Yw-uaV82M>
    - REACH Goal Setting Video – [https://youtu.be/\\_7gyyh3Kd-4](https://youtu.be/_7gyyh3Kd-4)
    - REACH Stress Management Video – <https://youtu.be/jk70GrYuXqw>
    - REACH Mood Management Video – <https://youtu.be/IR5LIUYnPIU>
    - REACH Problem Solving Video – <https://youtu.be/4PtI0Hs6-8U>
    - REACH Guided Imagery Video – <https://youtu.be/IB5UaCXH-HQ>
  - Process videos – need links
    - How to Download the Virtual Hope Box app  
<https://www.youtube.com/watch?v=NQVcRR2L7bg&pp=sAQA>
    - How to Add REACH Signal Breath Video and Coping Card  
<https://www.youtube.com/watch?v=ZhUdIYnFin4&pp=sAQA>
    - Adding REACH YouTube Videos to Virtual Hope Box  
<https://www.youtube.com/watch?v=RTRxexXZwgo&pp=sAQA>
    - How to Create Coping Cards in your Virtual Hope Box  
[https://www.youtube.com/watch?v=zYiz4pD\\_p6l&pp=sAQA](https://www.youtube.com/watch?v=zYiz4pD_p6l&pp=sAQA)
- **Databases** to track study activities – recruitment, data collection, and intervention
- **Recruitment brochure**

## 7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

### What individuals have worked on the project?

#### Memphis VAMC

Name: Linda Nichols  
Project Role: PI  
Researcher Identifier: LNichols1  
Person month: 3.0  
Contribution: Overall direction and approval, writing and editing of materials

Name: Jennifer Martindale-Adams  
Project Role: Co-I  
Researcher Identifier: Jmartindale  
Person month: 0.6  
Contribution: Writing and editing of materials

Name: Carolyn Clark  
Project Role: Research specialist  
Researcher Identifier: <https://orcid.org/0000-0001-5893-7646>  
Person month: 6  
Contribution: Development of materials for recruitment and intervention and data collection

Name: Jessica Roxy Martin  
Project Role: Research specialist  
Researcher Identifier: <https://orcid.org/0000-0003-1446-2583>  
Person month: 3.0  
Contribution: Development of materials for recruitment and intervention

## VCU

Name: Paul Perrin  
Project Role: Co-PI  
Researcher Identifier: PPERRIN  
Person month: 3.0  
Contribution: Overall direction and approval, writing and editing of materials

Name: Ronald Seel  
Researcher Identifier: RON\_SEEL  
Project Role: Co-I, as of 10-Aug-2022, now VCU site PI  
Person month: 1.2  
Contribution: Research design

Robert Perera  
Project Role: Statistician  
Research Identifier: ORCID: 0000-0002-0375-0427  
Person month: .36  
Contribution: Statistical support

Carmen Tyler  
Project Role: Program Coach (interventionist)  
Research Identifier: ORCID: 0000-0001-5265-184X  
Person month: 6.0  
Contribution: Delivery of intervention

Chimindindu Ohayagha  
Project Role: Program Coach (interventionist)  
Research Identifier: <https://orcid.org/0000-0003-3325-5424>  
Person month: 6.0  
Contribution: Delivery of intervention

Ashley MacPherson  
Project Role: Program Coach (interventionist)  
Research Identifier: <https://orcid.org/0000-0001-9654-4640>  
Person month: 6.0  
Contribution: Delivery of intervention

Emily Donovan  
Project Role: Program Coach (interventionist)  
Research Identifier: <https://orcid.org/0000-0002-5246-6297>  
Person month: 6.0  
Contribution: Delivery of intervention

Alexandra Ulbing  
Project Role: Data analyst  
Research Identifier: ORCID: 0000-0002-4578-0026  
Person month: 4.8  
Contribution: Management of data and data bases, statistical support

**Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?**

**Paul Perrin, PhD.**

Active Support: Polytrauma rehabilitation center traumatic brain injury model systems  
Time Commitments: 20%  
Supporting Agency: U.S. Department of Veterans Affairs, Department of Defense  
Performance Period: 06/01/2020 – 09/01/2025  
Level of Funding:

Active Support: Characterization, evaluation, and implementation of innovative TBI intensive evaluation and treatment programs (IETP)

Time Commitments: 2.5%

Supporting Agency: U.S. Department of Veterans Affairs

Performance Period: 07/01/2021 – 10/01/2024

Level of Funding:

Active support ended for grant: Identifying cognitive barriers to effective pressure ulcer self-care

Time Commitments: 5% (.6 Calendar Months)

Supporting Agency: Department of Defense

Performance Period: 03/01/2019 – 08/31/2020

Level of Funding:

Active Support ended for: Randomized clinical trial of a telehealth transition assistance program for SCI caregivers

Time Commitments: 17%

Supporting Agency: Craig H. Neilsen Foundation

Performance Period: 04/30/2017 – 04/29/2022

Level of Funding:

### **Ronald Seel, PhD**

Active Support: Sheltering Arms Institute Research Service Agreement

Time Commitments: 5%

Supporting Agency: National Institute on Disability Independent Living and Rehabilitation Research

Performance Period: 07/01/2021 – 06/30/2022

Level of Funding:

Active Support: Virginia Spinal Cord Injury Model System

Time Commitments: 2%

Supporting Agency: National Institute on Disability Independent Living and Rehabilitation Research

Performance Period: 09/29/2021 – 09/30/2026

Level of Funding:

Active support ended for grant: BeHEALTHY: Chronic Disease Management for Traumatic Brain Injury

Time Commitments: 3%

Supporting Agency: National Institute on Disability Independent Living and Rehabilitation Research

Performance Period: 9/1/20-8/31/2021

Level of Funding:

### **What other organizations were involved as partners?**

**Organization Name:** Virginia Commonwealth University (VCU)

**Location of Organization:** Richmond, VA

**Partner's contribution to the project:** VCU conducts intervention for caregivers, manages data, and will analyze all data

**Financial support:** Contract from Memphis to VCU

**In-kind support:** VCU provides all resources (space, computers, telephones) to their project staff

**Facilities:** VCU Departments of Psychology and Physical Medicine & Rehabilitation

**Collaboration):** VCU and Memphis staff share data and meet together weekly

**Personnel exchanges:** N/A

**Other:** N/A

**Organization Name:** University of Virginia (UVA)

**Location of Organization:** Charlottesville, VA

**Partner's contribution to the project:** Study co-PI, Paul Perrin, moved to UVA 10-Aug-2022

**Financial support:** Contract from Memphis to VCU

**In-kind support:** UVA provides all resources (space, computers, telephones) for Dr. Perrin

**Facilities:** UVA Departments of Psychology and Data Science

**Collaboration):** UVA, VCU and Memphis staff meet together weekly

**Personnel exchanges:** N/A

**Other:** N/A

## 8. SPECIAL REPORTING REQUIREMENTS

**COLLABORATIVE AWARDS:** N/A.

**QUAD CHART:** Quad Chart with Recruitment and Consort Diagram attached.

9. **APPENDICES:** *Attach all appendices that contain information that supplements, clarifies, or supports the text.*

- a. Rehabilitation Psychology Annual Meeting Presentation



PI: Linda Nichols

Org: Research Inc/VA Medical Center

Award Amount: \$1,299,885.00

**Study/Product Aim(s)**

- **Aim 1.** Modify/refine REACH Hope intervention and caregiver materials for caregivers of Veterans with TBI and dementia.
- **Aim 2.** Compare efficacy of REACH Hope in improving burden, depression, anxiety and caregiving self-efficacy for caregivers of Veterans with TBI and dementia to a waitlist control.
- **Aim 3.** Compare efficacy of REACH Hope in improving safety for Veterans with TBI and dementia whose caregivers have participated in REACH Hope to a waitlist control.

**Approach**

Randomized clinical trial of 110 caregivers of Veterans with TBI and dementia, half in each arm. Compare 6 one-hour individual sessions and use of Hope Box app, focusing on education, skills building and support over three months to wait list control. Data collected at baseline, 3, and 6 months for all, and 9 months for wait list control.



- Continue recruitment
- Continue intervention delivery
- Continue data collection and entry

**Timeline and Cost**

Activities	CY	20	21	22	23
Finalize materials, obtain approval, print materials			■		
Recruit subjects			■	■	
Administer interventions			■	■	■
Collect, analyze, and process data			■	■	■
Disseminate findings					■
<b>Estimated Budget (\$K)</b>		<b>\$143</b>	<b>\$447</b>	<b>\$483</b>	<b>\$227</b>

**Goals/Milestones**

**CY20 Goals**

- Prepare regulatory documents
- Train study staff
- Finalize research protocol/manual of operations (MOP)

**CY21 and CY22 Goals**

- Screening and recruitment
- Randomization and intervention delivery
- Data collection

**CY23 Goal**

- Data analysis
- Preparation and dissemination of results

**Comments/Challenges/Issues/Concerns**

- Recruitment has slowed – will expand recruitment sources
- Budget expenditures are not completely updated

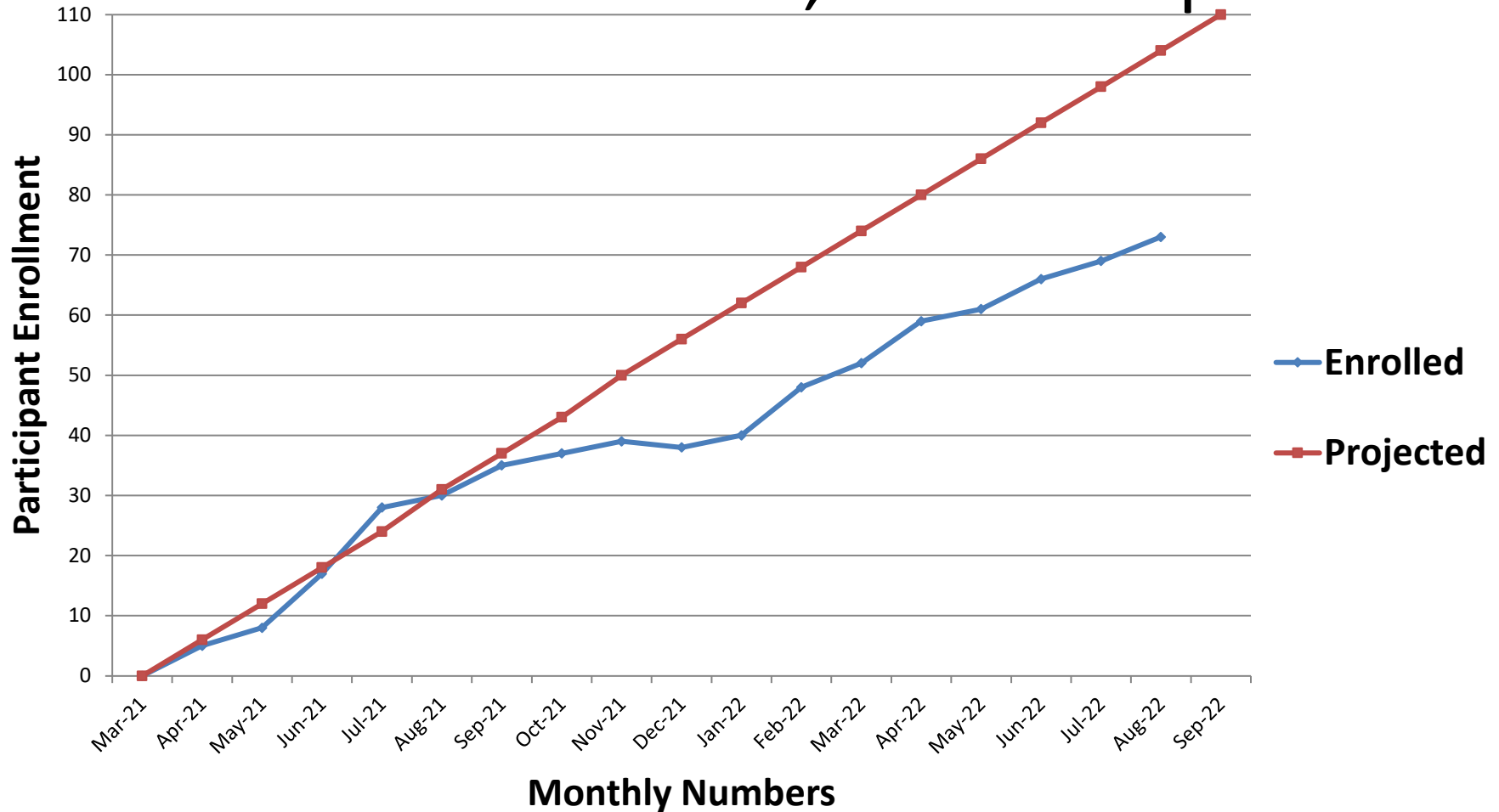
**Budget Expenditure to Date**

Projected Expenditure: \$936,295.75

Actual Expenditure: \$626,103.95

# Recruitment and Retention

## W81XWH2010756, REACH Hope

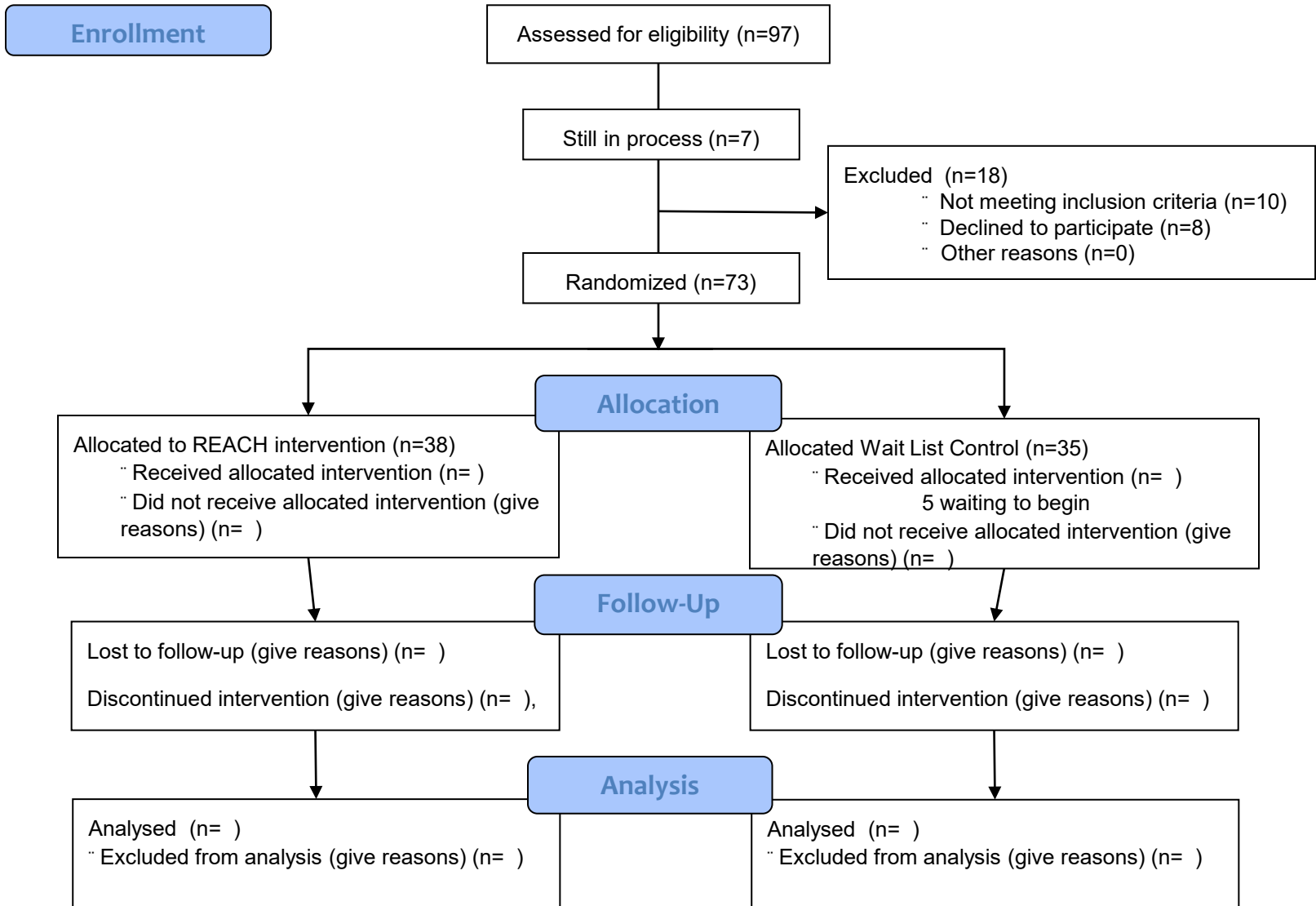


Percent of participants that complete study to 14-Aug-2022

36.4%

# W81XWH2010756 CONSORT Diagram

## 15-Aug-2020 through 14-Aug-2022



## Appendix 1 Year 2 REACH Hope Annual Report

**Conference:** Rehabilitation Psychology Annual Meeting, Louisville, KY, February 17-20 2022

Tyler, C.M., Ohayagha, C., MacPherson, A.R., Ulbing, A., Nichols, L.O., Perrin, P.B., Martindale-Adams, J.L., Clark, C., Martin, J.R., Zuber, J.K., Seel, R.T., & Perera, R.A. (2022, February). *Supporting caregivers of veterans with TBI and mixed dementia: The REACH Hope Behavioral Intervention*. [Poster presentation]. 24th Annual Rehabilitation Psychology Conference, Kentucky.

**Title:** Supporting Caregivers of Veterans with TBI and Mixed Dementia: The REACH Hope Behavioral Intervention

**Relevance to Conference Theme: What's Next...for Rehabilitation Science, Practice, & Collaboration:** Researchers and clinicians from the Veterans Affairs National Caregiver Center, University of Tennessee, and Virginia Commonwealth University have joined forces to design and evaluate the efficacy of an intervention utilizing personalized strategies and digital resources to support caregivers of veterans with both traumatic brain injury (TBI) and dementia. As the implications of experiencing a TBI in the development of dementia are still being elucidated, resources for these caregivers are sparse, and there are no evidence-based interventions that utilize both personalized strategies and digital resources to meet the complex needs of post-TBI dementia caregivers. This intervention provides needed guidance for assessing and meeting the needs of caregivers for people with TBI and dementia. The REACH Hope Behavioral Intervention represents a multisite, multidisciplinary effort to construct and implement a personalized intervention for the recently recognized comorbid conditions of TBI and dementia synthesizing traditionally printed and electronic resources.

**Abstract:**

**Background:** A history of TBI is associated with higher odds of developing Alzheimer's disease (Li et al., 2017; Perry et al., 2016), and as Vietnam-era veterans have entered into older adulthood, many who have experienced a TBI are developing dementia and manifesting symptoms with which their informal caregivers may be ill-prepared to cope. People with post-TBI dementia often have more health issues than those with dementia alone, including depressive, agitated, and irritable symptoms; gait dysfunction, motor slowness, and falls; disinhibition and emotional dysregulation (Dams-O'Connor et al., 2013; Sayed et al., 2013). Caregivers often lack the practical skills to manage post-TBI dementia and experience significant distress and burden. Rates of post-TBI dementia may increase as veterans of more recent wars age; for example, as many as 320,000 military servicemen and veterans who took part in Operation Iraqi Freedom may have TBI (Aarabi & Simard, 2009).

**Objective:** To describe the designing and testing of a virtual, personalized, evidence-based caregiver intervention that is providing resources for caregivers who are caring for individuals with TBI and dementia.

**Design:** REACH Hope combines and delivers two award-winning behavioral interventions, incorporating one-on-one personalized coaching sessions and mobile supports:

1. Department of Veterans Affairs' REACH (Resources for Enhancing All Caregivers' Health), utilizing personalized, one-on-one coaching to address caregiver's specific situations that create burden
2. Department of Defense's Virtual Hope Box mobile app, which provides anytime access to tools to meet caregiver needs during and beyond the one-on-one sessions

The REACH Hope Behavioral Intervention involves a randomized, controlled clinical trial comparing caregivers of Veterans receiving the REACH Hope intervention to those in a waitlist control group. All caregivers receive the intervention, but those on the waitlist receive it after a three-month data collection.

**Setting:** The intervention is implemented via telephone to informal caregivers of Veterans across the U.S. who are providing care in their homes.

**Participants:** Participants are the informal caregivers of veterans with post-TBI dementia. VA database searches revealed 1,638 veterans with a TBI diagnosis and a subsequent dementia diagnosis. Individuals with a diagnosis of dementia who subsequently had a TBI diagnosis are excluded.

**Main Outcome Measures:** Caregiver outcomes such as skill-building, burden, and distress; Veteran safety outcomes such as access to weapons, driving, and emergency situations.

**Results:** Recruitment, data collection, and intervention delivery are ongoing, with 35 caregivers currently in the study.

**Conclusions:** The REACH Hope virtual, personalized intervention can be successfully delivered to caregivers across many parts of the U.S. based on successful initiation and completion of caregiver intervention participants. Most caregivers (81%) appear able to access and use the Virtual Hope Box app successfully with reasonable assistance. We are slightly ahead of our projected recruitment goals, reflecting/validating the need for the intervention. Low study dropout rates and positive qualitative feedback from participants suggest that REACH Hope has potential a post-TBI/dementia, caregiver intervention.

**3 to 4 Key Words:** TBI, dementia, caregiver, REACH

### **3 Learning Objectives:**

1. Understand the more complex challenges presented by having post-TBI dementia than with either disorder alone
2. Gain understanding of how informal caregivers may benefit from personalized coaching to care for individuals with post-TBI dementia
3. Recognize the utility and advantages of combining one-on-one coaching sessions with online/digital resources

### **References**

- Aarabi, B., & Simard, J. M. (2009). Traumatic brain injury. *Current Opinion in Critical Care*, 15(6), 548–553. <http://doi.org/10.1097/MCC.0b013e32833190da>
- Dams-O'Connor K, Gibbons LE, Bowen JD, McCurry SM, Larson EB, Crane PK. (2013). Risk for late-life re-injury, dementia and death among individuals with traumatic brain injury: A population-based study. *Journal of Neurology, Neurosurgery and Psychiatry*, 84(2):177-182. doi:10.1136/jnnp-2012-303938
- Li, Y., Li, Y., Li, X., Zhang, S., Zhao, J., Zhu, X., & Tian, G. (2017). Head injury as a risk factor for dementia and Alzheimer's disease: A systematic review and meta-analysis of 32

observational studies. *PLOS ONE*, 12(1), e0169650.

<https://doi.org/10.1371/journal.pone.0169650>

Perry, D. C., Sturm, V. E., Peterson, M. J., Pieper, C. F., Bullock, T., Boeve, B. F., Miller, B. L., Guskiewicz, K. M., Berger, M. S., Kramer, J. H., & Welsh-Bohmer, K. A. (2016).

Traumatic brain injury is associated with subsequent neurologic and psychiatric disease: A meta-analysis. *Journal of Neurosurgery*, 124(2), 511–526.

<https://doi.org/10.3171/2015.2.JNS14503>

Sayed N, Culver C, Dams-O'Connor K, Hammond F, Diaz-Arrastia R. (2013). Clinical phenotype of dementia after traumatic brain injury. *Journal of Neurotrauma*, 30(13), 1117-1122. doi:10.1089/neu.2012.2638