# Mobile Health (mHealth) Technologies used in the U.S. Veterans Health Administration

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# Discussion Topics

▸ **Review Results of 2013 Research Study**

  ▸ "The Impact of Mobile Health (mHealth) Technology on Family Caregiver's Burden Levels and an Assessment of Variation in mHealth Tool Use"

▸ **Review New VA Mobile Apps**

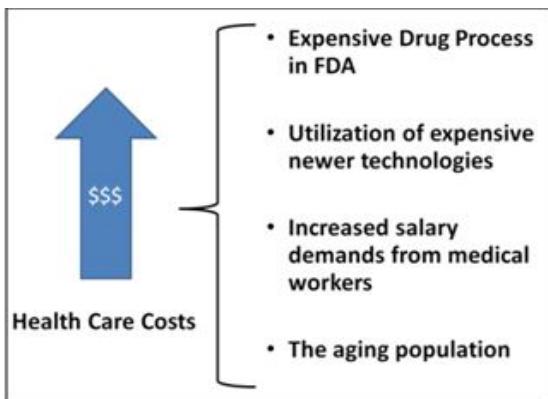  ▸ Apps are available for distribution to open source community

# Impetus for the Research
## Joint Investigation of the U.S. Department of Veterans Affairs (VA) & George Washington University (GWU)

### Over 2 million U.S. Vets Returning from War – Many Seriously Injured



### Costs Escalating



- Expensive Drug Process in FDA
- Utilization of expensive newer technologies
- Increased salary demands from medical workers
- The aging population

$$$ Health Care Costs

### VA's Family Caregiver Program



### High Rates of Stress & Burden



CAREGIVER BURNOUT. Help and Prevention

### Mobile Health's Potential



### VA Family Caregiver Mobile Health Pilot



VA Mobile
VA Health
Get connected!
mobilehealth.va.gov

# VA Family Caregiver Program

▸ July of 2012 there were 4,501 Caregivers enrolled, today there are over 21,000 enrolled

▸ Caregivers receive a stipend from the VA of ~USD1,500 per month to provide in home healthcare support to Veterans

▸ Program provides training, counseling and respite care to support the Caregivers

▸ Program is staffed by VA Caregiver Support Coordinators who make quarterly home visits

▸ Veterans in the program are from post 9/11 wars and have sustained severe physical and emotional injuries from require caregiving services

# Study Purpose

▸ Contribute to the evidence base regarding the effectiveness of technology-based solutions, specifically mHealth tools, in reducing Family Caregiver burden

▸ Describe the relative use of the mHealth apps and the factors that predict this use in a medically complex Caregiver-Care Recipient population

# Related Research

‣ Technology-based Caregiver interventions studies have shown mixed results in reducing Caregiver burden/stress

- Caregivers report the need for access to more health information and ways to communicate with providers
- mHealth interventions had not been studied in the Caregiver population and this study is the first to do so

‣ Many mHealth studies are limited, many poorly designed with small sample sizes

- Unclear what factors influence use of mHealth and if it is the same as factors driving other Consumer Health Technologies
- This study is the first to identify factors driving mHealth use in this Caregiver/Veteran population

# What Caregivers want from Technology



National Alliance for Caregiving, "e-Connected Family Caregiver: Bringing Caregiving into the 21st Century," NAC, 2011
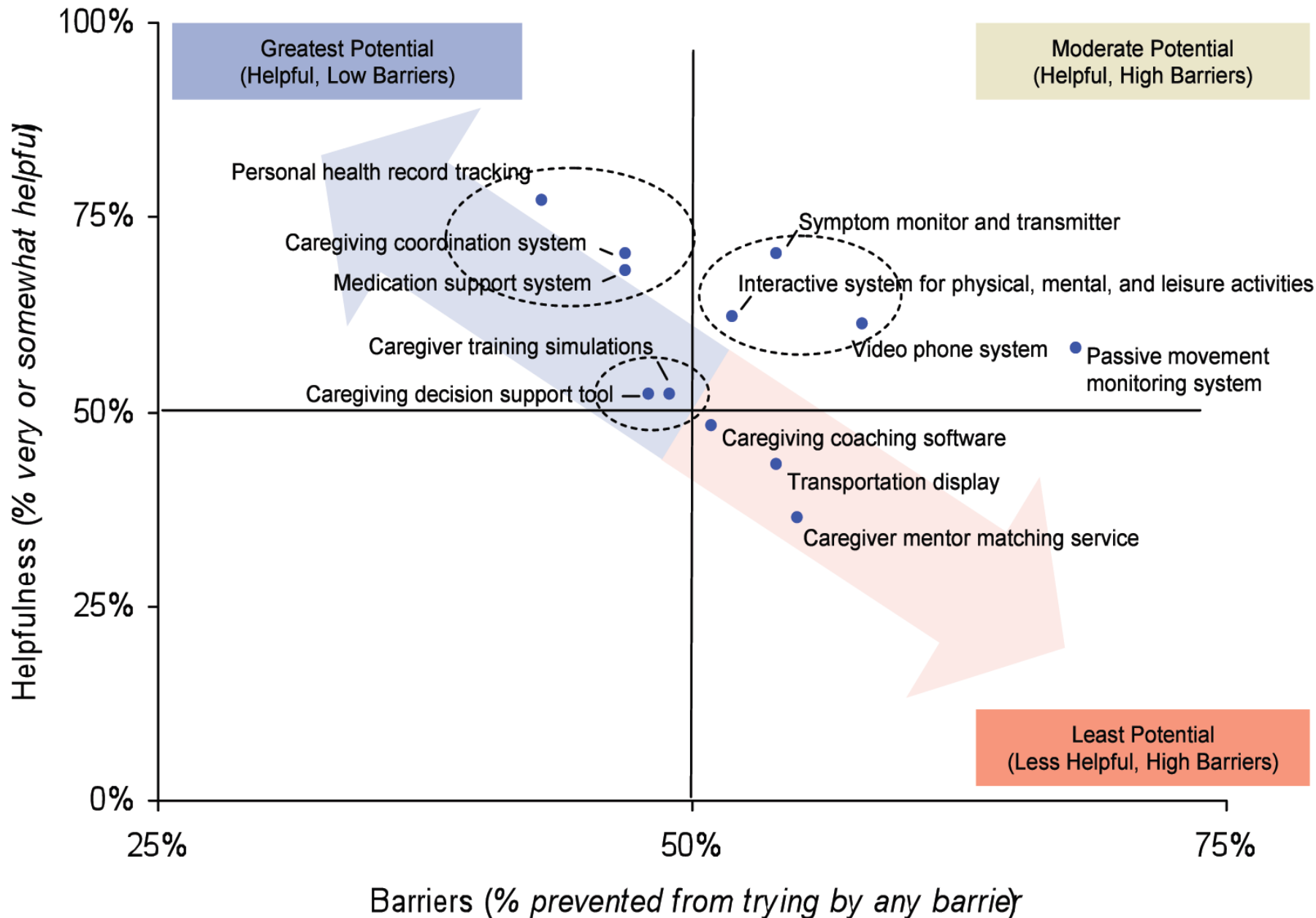
# Significance of the Research

▸ Finding ways to reduce Caregiver burden is important:

- Caregivers provide USD450 billion in uncompensated care in U.S. annually

- Caregivers prevent /delay institutionalization of care recipients

- High rates of burnout reduce Caregivers' ability to provide care

▸ Understanding which mHealth apps are most commonly used by Caregivers and their Veterans, along with factors that influence their use, is important to future mHealth implementation decisions

# Study Design

## Zarit Burden Study

▸ Quasi-experimental pretest/posttest design with a nonrandomized control group

| | | |
|---|---|---|
| Treatment Group | O X O | (N=620) |
| ---------------------------------------- | | |
| Control Group | O   O | (N=2,274) |

$O$ = Measurement
$X$ = mHealth Intervention

## mHealth Use Study

▸ Prospective Cohort Study Design (3 months)

Exposed Group Received mHealth Intervention N=881

Subset Completed Research Surveys N=577

Predict
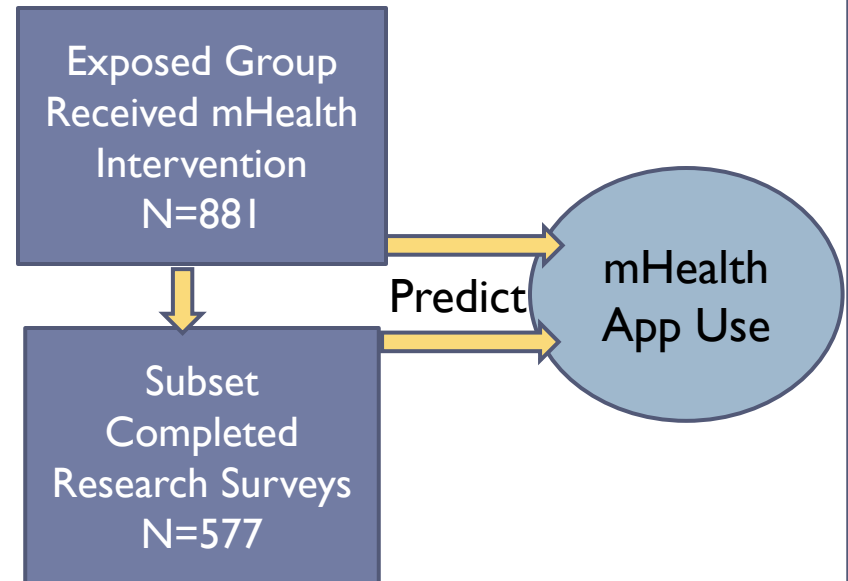
mHealth App Use

**Designed as an "intention to treat" study by including in the analysis patients who received the intervention but may not have used it**

# Two Study Research Questions

▸ Will VA Family Caregivers/Vets receiving a suite of mHealth apps on an iPad® have a significantly different change in measured caregiver burden levels at the end of the 3 month study period, as compared with a measured control group, after adjusting for pre-study burden levels and other covariates?

▸ What is the relative use of the mHealth apps provided to the treatment group, and what are the characteristics of the Caregivers and Veterans that predict their use?

# Intervention

▸ iPad loaded with a suite of mobile health apps designed to support Caregivers

▸ Intervention was only available to study participants

▸ Initial App concepts were created based on needs identified by Caregiver focus groups

▸ Specific App design sessions & usability sessions were then held with follow-up Caregiver/Veteran focus groups

▸ Support included: Quick Start guide, Help desk, website with FAQs, monthly newsletter

▸ Logging on to apps required Dept of Defense (DoD) supplied credentials

# mHealth Apps

**Launchpad:** Container for all study apps

**Summary of Care:** Provides access to health care record

**Notifications:** Sets medication reminders

**Rx Refill:** Refill prescriptions

**Journal:** Diary

**Care4Caregivers:** Caregiver Support

**PTSD Coach:** PTSD Support

**Pain Coach:** Pain Support
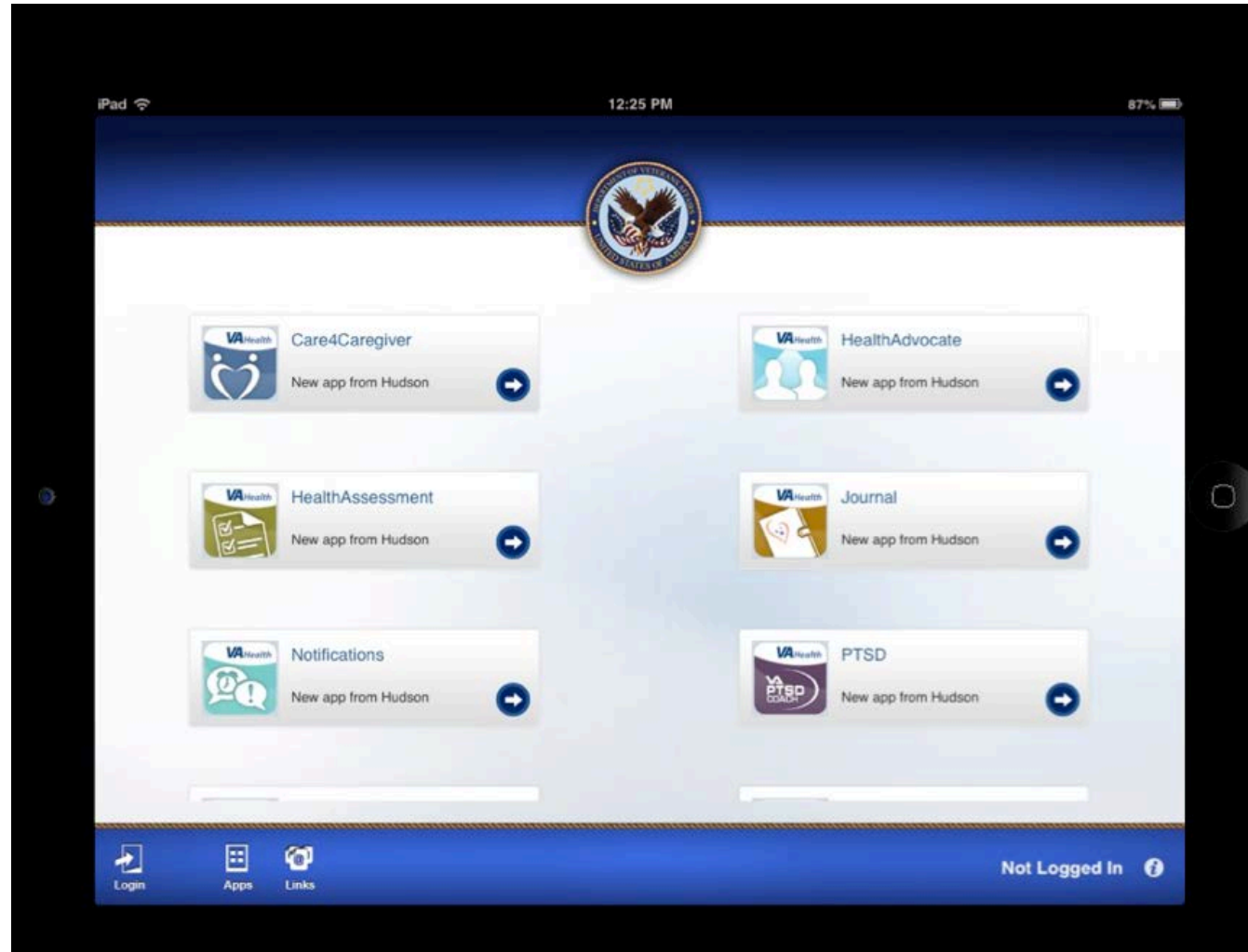
# Data Collection

# Zarit Burden Study Data Collection

- Zarit Burden Inventory administered quarterly during home visits by VA staff & recorded in Electronic Health Record (EHR)
- Zarit Burden Scores extracted from EHR using text mining
- VA Administrative Databases used as covariate data source

Study Start Date = June 1, 2013 or Day iPad Received

Study End Date September 18, 2013
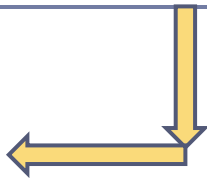
Look back 6 months from study start date and extract most proximal Zarit Burden Score

Look forward 6 months after study end date and extract most proximal Zarit Burden Score

If post study Zarit is not found, select last Zarit after study start date

# mHeath Use Study Data Collection

- ▶ App use was tracked and sent to backend database

  - ▪ Metrics collected: user, app used, time, duration of use

- ▶ VA administrative databases were used as source for predictor variables

- ▶ Survey data was collected by asking participants to complete the surveys on the iPads

- ▶ If surveys were not completed within 2 weeks of receiving the iPad, participants were contacted and asked to complete on iPad or via a telephone interview

# Outcome Variables

▸ **Zarit Burden Study: Change in Zarit Burden Score**

- 4 question Zarit screening score extracted from EMR

▸ **mHealth Use Study: App Use**

- At least one use of the mHealth apps

- Frequency of use of the mHealth apps for those who have used

- App use was measured for each app individually and for the group of seven study mHealth apps

# Statistical Analysis

# Statistical Analysis

- Zarit Burden Study:
  - General Linearized Model (GLM) used to assess differences between control and treatment groups in the outcome variable Zarit burden change scores

- mHealth Study:
  - Logistic Regression Model used to understand the factors that predict at least one use of the apps

# Results

# Study Group Characteristics

- 95% were woman and 91% were spouses
- Average age was 40 years
- 66% reported providing care more than 40 hours/week
- 27% reported having a high burden level
- 40% lived in a rural area
- 30% had Traumatic Brain Injuries
- 90% had PTSD or other mental illness
- 9% had Spinal Cord Injuries

# Zarit Burden Study Results

# Key Finding from Zarit Burden Study

The study did not observe that the mHealth intervention had a significant impact on Zarit burden change

This result is consistent with other Caregiver burden technology intervention studies

The three month study period may have been too short to see a fuller effect of the mHealth intervention

# Post Hoc Analysis Results
## Adjusted Mean Zarit Burden Change Scores
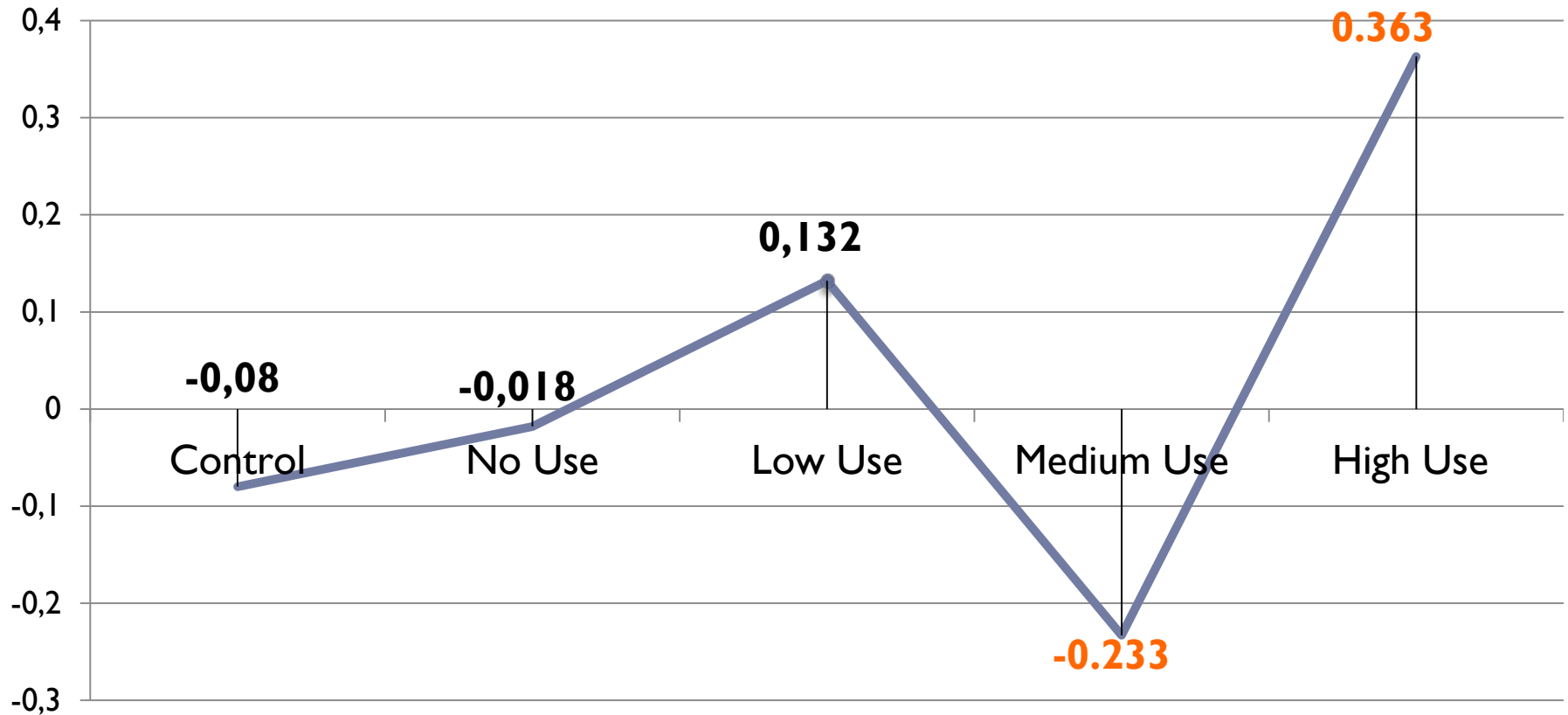


The high use group experienced an increase in Zarit burden that was statistically different from the control group (p=0.047)

The medium use group experienced a decrease in Zarit burden that was borderline statistically different from the high use group (p=0.055)

# mHealth Use Study Results

# mHealth Use Study Outcome Measures



Binary Outcome – At Least One App Use

mHealth Study Group (N=882)

mHealth Study Group Completing Surveys (N=577)
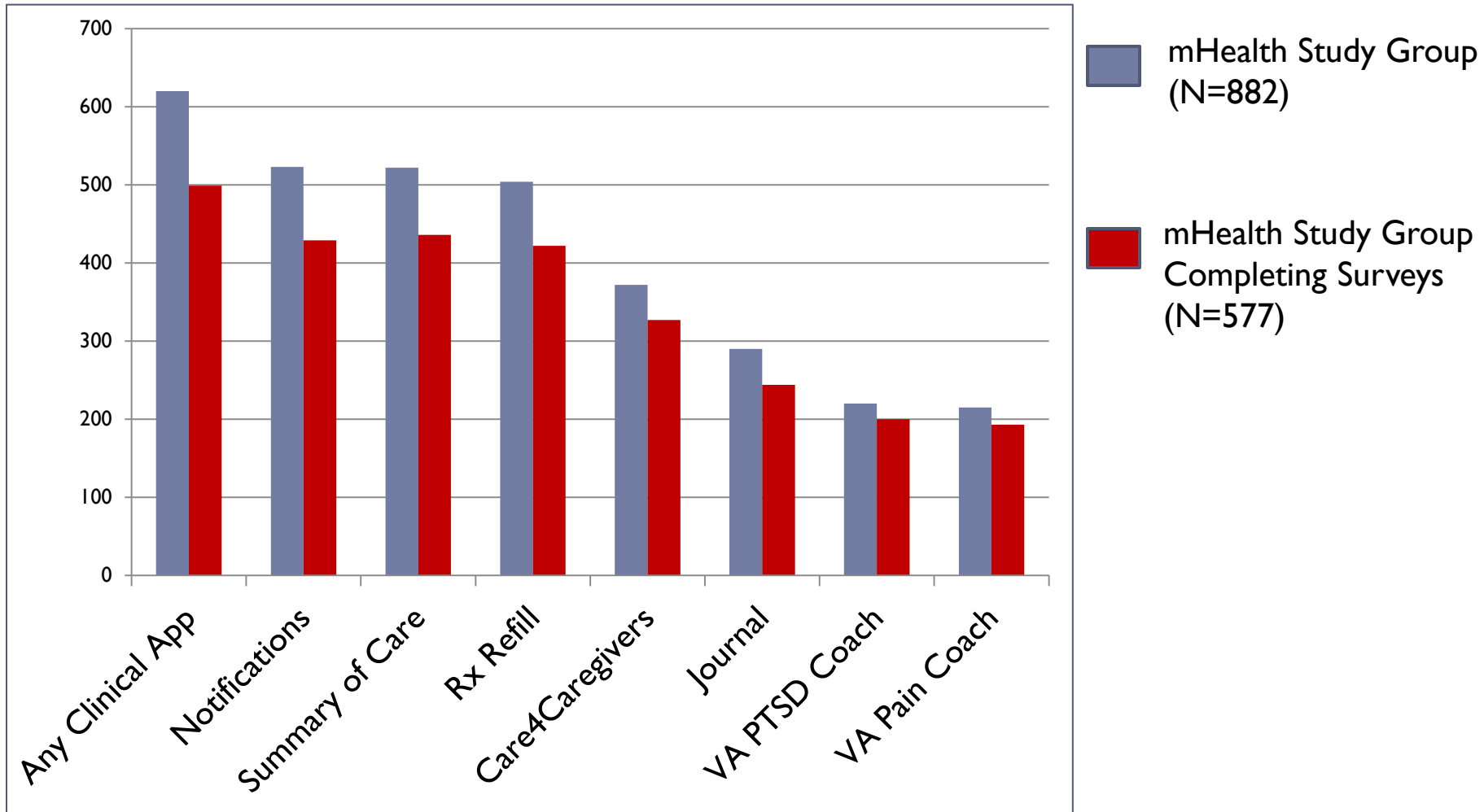
# Key Findings from Logistic Regression Modeling

Modeled the factors that predict interest in using the mHealth Apps – using the app at least once

▸ Living in a **rural** location increased initial use by **1.5** times
- Other studies have shown that use of eHealth tools in rural area is less than urban, due to reduced internet access
- Providing data plans may have contributed to increased rural use

▸ Every one year increase in **age decr**eased initial app use by **2%**

▸ **Spouse** Caregivers were **2.4** times more likely to use the apps than non-spouse Caregivers

▸ Caregivers caring for Veterans with **mental health condi**tions (other than PTSD) were **1.6 times more likely to use the apps**

▸ **Caregivers who felt less prepared** for Caregiving were **40% more likely** to try using the apps

# VA Mobile Apps

# VA App Store

▸ **Currently the majority of VA Health Mobile Apps are cataloged on the VA's App Store at: http://mobile.va.gov/appstore**

▸ **Apps discussed today are "tethered" to VA data systems so that information can be exchanged between providers and Veterans/Caregivers**

## VA Mobile Apps Discussed Today

| | |
|---|---|
| Care4Caregiver | My VA Health Video |
| Summary of Care | Dementia Care |
| Pain Coach | Annie |
| My VA Health | |

# Care4Caregiver App

If you are a Caregiver for a Veteran, the Care4Caregiver App is designed to support you by educating you about self-care and normal reactions to caregiving responsibilities, helping you track and manage your personal strain level, and providing you with access to tools for coping skills, psychological education and other community and personal resources.

# *Learn* about Caregiving

**Learn**

**Emotional Consequences of Caregiving**

Take Care of Yourself

Build Resilience

Manage Stress

Manage Relationships

**Learn about the emotional consequences of caregiving, as well as ways to take care of yourself, build resilience, manage your stress level and strengthen your relationships.**

# *Assess* your strain level



**Take regular self-assessments to help you track your strain level over time.**

# *Manage* your strain



Meditate

Note: This tool contains a 10 minute countdown timer.

Meditate.

9:53

☆ Try Another | Done

List 5 things you like about yourself

Change negative moods by doing something pleasant:

List 5 things you like about yourself.

☆ Try Another | Done

**Use resources in the app to help you with coping mechanisms and self-care. Resources can help you:**

‣ Take a Time Out

‣ Plan a Social Activity

‣ Distract Yourself

‣ Soothe Yourself

‣ Change Perspective

‣ Relax Yourself

Get Support

# Summary of Care App



If you are a Veteran enrolled in VA health care, the Summary of Care App lets you receive and view your VA medical information in one place and from the convenience of your mobile device.

# *Access* your health data



**Access data from certain parts of your VA Electronic Health Record (EHR):**

- Contact Information
- Medical Diagnoses
- Allergies
- Medications
- Surgeries
- Lab Results
- Vital Signs
- Radiology Exams

# *Share* your health data



**Download, save or print a PDF of your record to have on hand or share with your Caregivers and providers**

# Pain Coach App

If you are a Veteran enrolled in VA health care, the Pain Coach App helps you manage your pain. Through the app, you will be able to enter information about pain you experience, such as the type, severity, location and effect. You can track your pain over time, set goals for improving your conditions and share information with your VA care team.

# *Manage* your pain
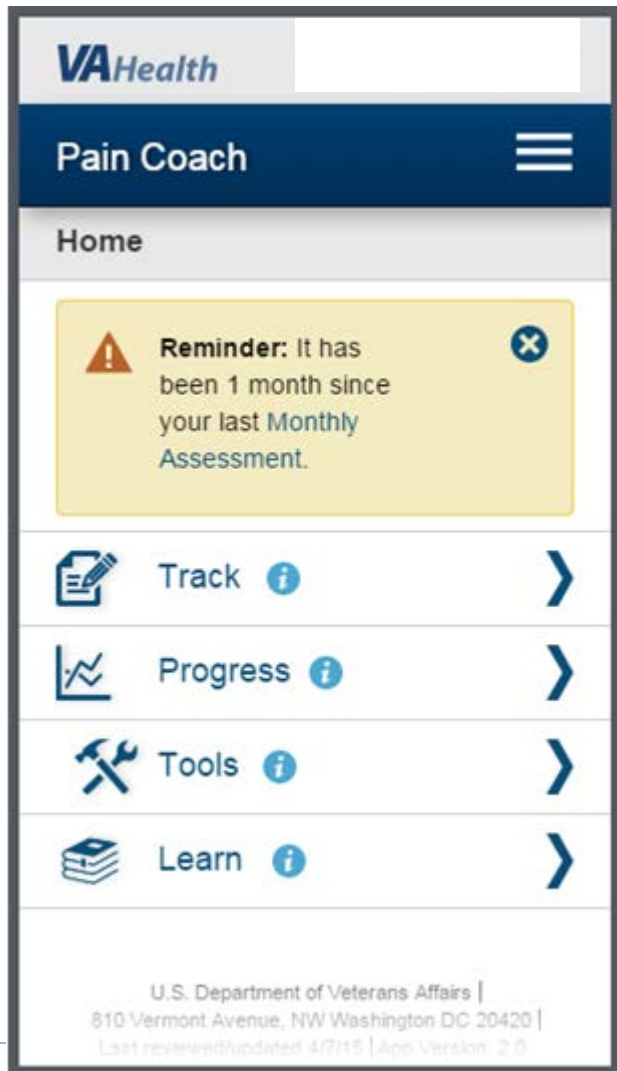


- ▸ **Track -** take monthly and daily pain self-assessments and set reminders.
- ▸ **Progress -** view your pain levels over time as a graph and view tools to help you manage pain.
- ▸ **Learn -** access a list of articles, resources and links to related topics.

# *Assess* your pain



Take regular self-assessments of your pain levels to see recommendations on next steps.

# *Keep* a pain diary



Rate your pain level daily to better track it over time.

# *Access* treatment tools
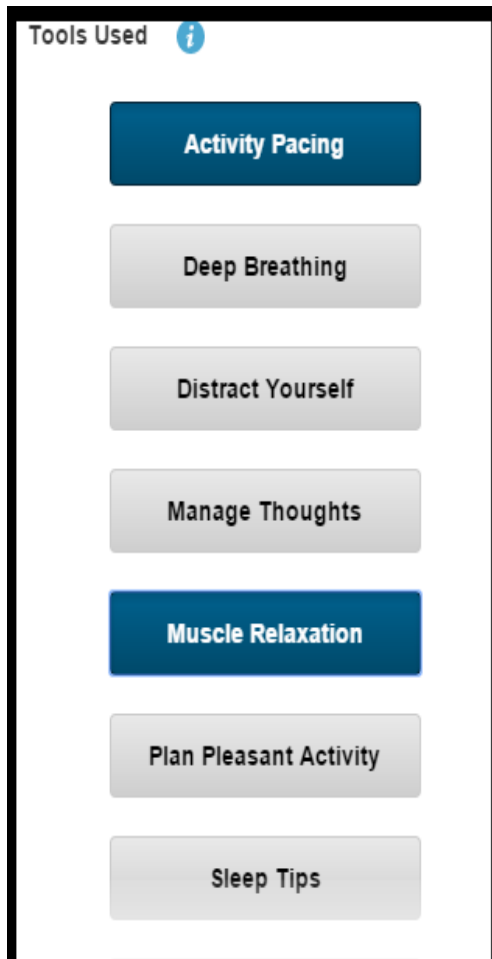


**Easily find coping tools and activities to help you manage your pain.**

# My VA Health App

If you are a Veteran enrolled in VA health care, the My VA Health App helps you track your health data, record your life and health goals over time, and share information about your health with your VA care team. You will also have the ability to create graphs and download your health information to a PDF.

# *Track* your data



**Manage your health by keeping track of your health readings including blood pressure, cholesterol, weight and more.**

# *Record* your story & goals



Through the **My Story** feature, you can record your personal values, assessments and reflections, and track your life and health goals over time.

# My VA Health Video App For Veterans



If you are a Veteran enrolled in VA health care, the Video App will help you connect with your VA care team by allowing you to submit short videos related to your health care that your care team has requested. This app will help your care team better visualize health issues you might be facing, even when you are not in the same physical location.

# *Monitor* your video requests



See new video requests from your care team.

# *Upload* a video



**Easily upload a health video and fill in related information from your mobile device.**

# Dementia Care App (Caregivers)

If you are a Caregiver for a Veteran with dementia, the GRECC App will provide you with support and educational resources, including informational videos from medical experts. The app will also help you communicate and share information with your Veteran's care team, and log and track your Veteran's health information over time.

# *Access* resources



**Access support tools and resources to help you learn about caring for your loved one with dementia.**

# *Track* your Veteran's health



**Regularly log physical and mental health measures for your Veteran including sleep, agitation, pain, confusion and more. You can also log your own stress levels. This information can be accessed by your Veteran's care team.**

# VA's Text Messaging System

**annie**

**Annie G. Fox**
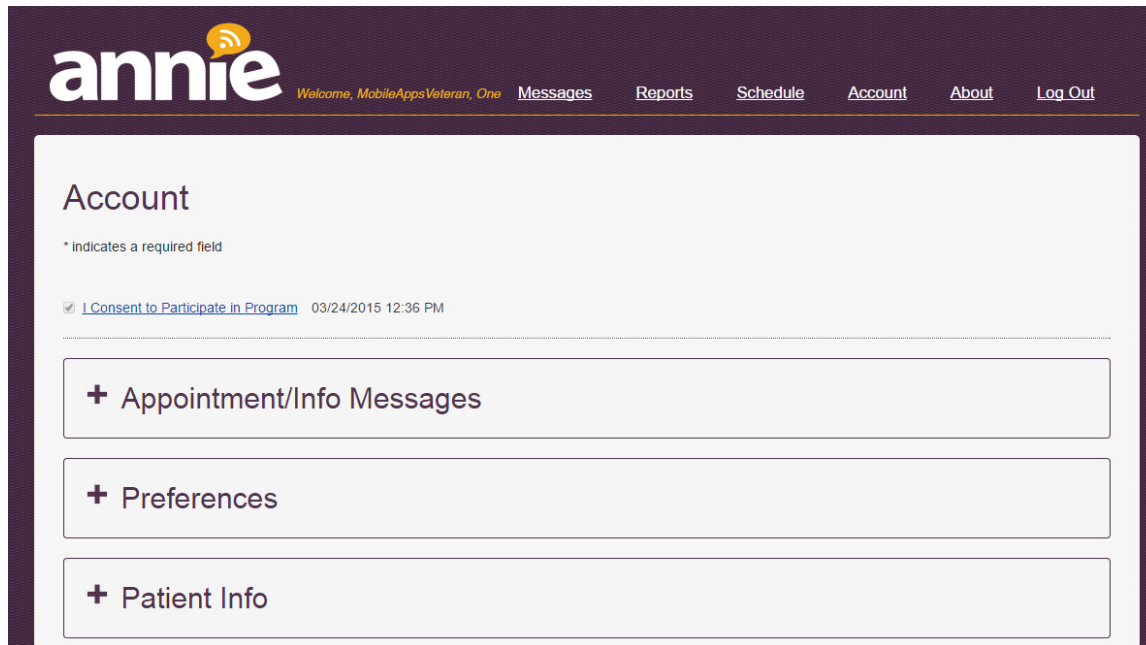
*August 4, 1893 – January 20, 1987*

- First woman to receive Purple Heart
- Chief Nurse in Army Nurse Corps at Pearl Harbor

# Annie for Veterans App



The Annie App is a Short Message Service (SMS) text messaging capability that promotes self-care for Veterans enrolled in VA health care. When your provider or a member of your VA health care team signs you up for Annie for a health issue, you will receive automated messages that prompt you to track your own health. You are asked to reply to messages so that Annie can let you know how you are doing. Annie also can send you appointment reminders and messages from your local VA medical facility.

# *Annie* – access and self-care



You can send and receive message through **Annie** on a basic cell phone that includes a texting feature, or you can access the Annie App on any mobile device connected to the Internet, including a computer or a smartphone.

Whichever way you choose, Annie can help you track your health on your own.

*Note: Annie is for self-care. Your text and message replies to Annie are kept in a computer system. Your VA health care team will be able to view the messages, but will not routinely review them.

# Thank you

- **My Contact Information:**

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