

AWARD NUMBER: CDMRPL-16-0-DM167009

TITLE: Telehealth 2.0; Preserving Continuity of Behavioral Health Clinical Care to Patients Using Mobile Devices

PRINCIPAL INVESTIGATOR: Jeanette R Little

RECIPIENT: Intramural Award to United States Army Medical Research and Materiel Command Telemedicine and Advanced Technology Research Center (USA MRMC TATRC)

Fort Detrick MD 21702

REPORT DATE: July 2018

TYPE OF REPORT: Annual

PREPARED FOR: U.S. Army Medical Research and Materiel Command
Fort Detrick, Maryland 21702-5012

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1. REPORT DATE July 2018			2. REPORT TYPE Annual		3. DATES COVERED 1 Jul 2017 - 30 Jun 2018	
4. TITLE AND SUBTITLE Telehealth 2.0; Providing Continuity of Behavioral Health Clinical Care to Patients Using Mobile Devices					5a. CONTRACT NUMBER	
					5b. GRANT NUMBER CDMRPL-16-0-DM167009	
					5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Jeanette R Little Email: jeanette.r.little.civ@mail.mil					5d. PROJECT NUMBER	
					5e. TASK NUMBER	
					5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Intramural Award to United States Army Medical Research and Materiel Command Telemedicine and Advanced Technology Research Center (USA MRMCM TATRC) Fort Detrick MD 21702					8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Medical Research and Materiel Command Fort Detrick, Maryland 21702-5012					10. SPONSOR/MONITOR'S ACRONYM(S)	
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13. SUPPLEMENTARY NOTES						
14. ABSTRACT This project aims to use mobile technology to leverage telehealth services as a means to maximize the continuity-of-care that the military healthcare system (MHS) can provide to Service Members when they are temporarily relocated due to military service requirements, but require and are engaged in behavioral health (BH) services. The effort will focus on utilization of the patient's personal mobile device in an approved, secure fashion to maintain the established therapeutic relationships with their BH provider(s) during an outside the continental United States (OCONUS) temporary duty assignment (TDY) using a relational model of care delivery to complete a course of treatment that the patient sought out prior to being reassigned.						
15. SUBJECT TERMS- None						
16. SECURITY CLASSIFICATION OF:				17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON USAMRMC
a. REPORT U	b. ABSTRACT U	c. THIS PAGE U	19b. TELEPHONE NUMBER (include area code)			
				UU	12	

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9. Appendices	N/A

- 1. INTRODUCTION.** This project aims to use mobile technology to leverage telehealth services as a means to maximize the continuity-of-care that the military healthcare system (MHS) can provide to Service Members when they are temporarily relocated due to military service requirements, but require and are engaged in behavioral health (BH) services. The effort will focus on utilization of the patient's personal mobile device in an approved, secure fashion to maintain the established therapeutic relationships with their BH provider(s) during an outside the continental United States (OCONUS) temporary duty assignment (TDY) using a relational model of care delivery to complete a course of treatment that the patient sought out prior to being reassigned.

There are four specific aims to this research effort: (1) develop the required technology enhancements to the existing mobile health (mHealth) product to support this project (2) to test the feasibility of the mobile interface for patient use; (3) to establish the acceptability of this technology approach with BH providers; and (4) deploy and evaluate the technology solution in a clinical context. As a result of this project best practices will be established in order to lay the groundwork for more expansive transformations of the tele-BH care delivery process, minimizing disruptions in psychotherapeutic interventions, working collaboratively between remote and local sites for comprehensive care, and potentially reshaping how telehealth is delivered in operational venues.

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

Telehealth
Virtual Health
Mobile Health
Remote Behavioral Health
Remote services
Teletherapy
Telepsychology
Bring Your Own Device
BYOD

- 3. ACCOMPLISHMENTS:** The PI is reminded that the recipient organization is required to obtain prior written approval from the awarding agency Grants Officer whenever there are significant changes in the project or its direction.

- **What were the major goals of the project?** There are four technical objectives for this research effort:
 - A. Develop the capability to provide mobile telehealth to patients in remote locations
 - B. Maximize the patient and provider's usability ratings of the mHealth product(s)
 - C. Determine the technical feasibility of providing care from CONUS to OCONUS locations
 - D. Identify technical issues to revise in order to improve the quality of and access to care delivered remotely

- **What was accomplished under these goals?**

Actions Completed:	Completion Date
A. JPC-1 Awarded Project	21 June 2016
B. Research Support Services Contraction action submitted to USARMAA	10 October 2016
C. Face-to-face meeting with USAMRAA to finalize procurement strategy	11 January 2017
D. Phase 1 of the research support services contract solicitation was posted on the Federal Business Opportunities Website	21 February 2017
E. Phase 1 vendor eligibility selection completed	29 March 2017
F. Phase 2 of the research support services contract solicitation was posted on the Federal Business Opportunities website	30 March 2017
G. USAMRAA Contract awarded to UTHSCSA	12 June 2017
H. Contract Kick-Off meeting with UTHSCSA	26 June 2017
I. Refinement of eligibility criteria, exclusion criteria and screening protocol for pilot	31 August 2017
J. Develop pilot protocol	31 August 2017
K. Finalize consent form and human subjects protocol	31 August 2017
L. Submit protocol for HRPO pre-review.	1 September 2017

M. Submit protocols to UTHSCSA IRB and seek Institutional Agreement for IRB review (IAIRs) from BAMC	1 September 2017
N. Protocol Submitted to MRMC HRPO for pre-review	12 September 2017
O. UTHSCSA IRB approval obtained	20 September 2017
P. MRMC HRPO pre-review completed	10 October 2017
Q. CRDAMC HRPP protocol review submission	22 December 2017
R. Desktop VTC infrastructure for Study Identified	21 March 2018
S. Definite/Finalize Technical Requirements	30 March 2018
T. Desktop VTC Technology and mHealth Platform installed at CRDAMC	15 June 2018
U. Site Visit to CRDAMC/Ft Hood to Test mHealth Connections	18-19 June 2018
V. CRDAMC Technical Kick Off Meeting	19 June 2018
W. Commence Recruitment of Providers (n=3-10)	18-19 June 2018

- What opportunities for training and professional development has the project provided?** In June 2018, the first of a series of planned introductions to the mHealth technical prototype were provided to the Charlie R Darnall Army Medical Center (CRDAMC) Behavioral Health Teams. In the next phase of this project, there will be significantly more opportunities for the behavioral health teams to learn novel means of outreach to their established patients.
- How were the results disseminated to communities of interest?** Nothing to report at this juncture.

- **What do you plan to do during the next reporting period to accomplish the goals?**
In the next quarter, the following milestones will be accomplished to further this project towards its stated end goals:

Milestones to be Completed:	Projected Completion Date
A. mHealth Prototype Testing/Quality Assurance	15 August 2018
B. Development of End User Guides (Patient & Provider)	30 September 2018
C. Desktop VTC technology and mHealth Platform installed at DHA J-9/T2 to conduct usability assessment	30 September 2018
D. Expert Review of mHealth Prototype	October 2018
E. Analysis of Design Features	October 2018
F. Consent, conduct pretest and enroll provider participants	October 2018
G. Provide training to provider participants	October 2018
H. Credential providers as telebehavioral health providers	October 2018

4. IMPACT: Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:

- **What was the impact on the development of the principal discipline(s) of the project?** Nothing to Report
- **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.**
 - a. **Project Timeline Changes.** Due to both initial contracting delays for the initial award, and some delays in obtaining IRB approvals, the overall timeline for this project as shifted. The project start date with the contracting aware resulted in work commencing in June of 2017, 12 months after project approval and 9 months after funding was received. Once the project commences, there were additional delays in obtaining the IRB approvals, which resulting is requesting and obtaining an additional 90 day no cost extension to the base year of the contract. At this time the project completion will be in December 2019. No additional timelines delays are expected in the timeline moving forward.
 - b. **Technical Approach Changes.** At the time the project proposal, DHA HIT had pledge support for the just of their Cisco Jabber tool for the provider desktop interface. But the time the research projected commenced in June 2017, that solution had been sun-settled, and was no longer available. The research team explore the new DHA Cicso Meeting system solution, and found it did not support a secure connection with Android devices. The WebRCT solution that is in use at Landstuhl Army Medical Center was also explored, and it was found to only support Android devices through a web browser, and would not allow us to support a secure mobile connection to either mobile operating system. However, the VidyoConnect Commercial Off The Shelf (COTS) solution, which is the backbone of the DISA Global Video System (GVS) was successfully assessed and testing and found to be compatible with a secure connection to both mobile operating systems through a dedicated application, and did not require installation of any additional software on the providers .mil desktop computer. Furthermore, because this solution is the engine of the GVS system, all the required ports, protocols, and Information Assurance (IA) considerations existed and addressed all concerns from the local Information Management Division (IMD). The GVS system is expected to migrate to support mobile devices during the data collection period of this study, and lessons learned from this pilot will help to advice the MHS and DHA on novel ways to securely use this existing DoD infrastructure outside of this research study.
- **Actual or anticipated problems or delays and actions or plans to resolve them.** Nothing additional to report since implementing VYDEO solution.
- **Changes that had a significant impact on expenditures.** Because of the changes in timeline highlighted above (see section for Project Timeline Changes), the research team requested that the second year of project funding by issued in FY18 instead of FY17.
- **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
- **Significant changes in use or care of vertebrate animals.** N/A – Nothing to Report
- **Significant changes in use of biohazards and/or select agents.** N/A – Nothing to Report

6. PRODUCTS: List any products resulting from the project during the reporting period. If there is nothing to report under a particular item, state “Nothing to Report.”

- **Publications, conference papers, and presentations**

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).** Nothing to Report
- **Technologies or techniques.** This project is using Commercial Off the Shelf (COTS) software and existing mobile health systems in a novel way to reach established behavioral health patients outside of fixed facilities
- **Inventions, patent applications, and/or licenses.** Nothing to Report
- **Other Products** Nothing to Report

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

- **What individuals have worked on the project?**

Name: Project Role Research Identifier (e.g. ORCID ID): Nearest person month worked: Contribution to the Project: Funding Support:	COL Jeffrey Yarvis Co-PI n/a 1 Co-PI None
Name: Project Role Research Identifier (e.g. ORCID ID): Nearest person month worked: Contribution to the Project: Funding Support:	Dr. Larry Pruitt Co-PI 000-001-6925-7830 2 CoPI None

Name: Project Role Research Identifier (e.g. ORCID ID): Nearest person month worked: Contribution to the Project: Funding Support:	Dr. Katherine Dondaville Co-PI 000-003-4204-7826 1 Co-PI JPC-1
Name: Project Role Research Identifier (e.g. ORCID ID): Nearest person month worked: Contribution to the Project: Funding Support:	Michelle Locklear Barrera, B.S. Project Coordinator n/a 1 Research Associate JPC-1
Name: Project Role Research Identifier (e.g. ORCID ID): Nearest person month worked: Contribution to the Project: Funding Support:	Amanda Schmeltz Research Project Manager Support n/a 2 Project Management JPC-1

- **Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?** Ms. Michelle Locklear Barrera has joined the onsite team at Fort Hood in the last quarter.
- **What other organizations were involved as partners?**

Organization Name:	PHCoE Defense Health Agency Research and Development (J-9) (formerly T2)
Location of Organization:	Joint Base Lewis-McCord, WA
Partners Contribution to this project:	<ul style="list-style-type: none"> • Facilities (e.g., project staff use the partner's facilities for project activities) • Collaboration (e.g. partner's staff work with project staff on the project)
Organization Name:	CRDAMC
Location of Organization:	Fort Hood, TX
Partners Contribution to this project:	<ul style="list-style-type: none"> • Facilities (e.g., project staff use the partner's facilities for project activities) • Collaboration (e.g. partner's staff work with project staff on the project)

Organization Name:

Location of Organization:

Partners Contribution to this project:

UTHSCA/Strong Star Consortium

San Antonio, TX

Fort Hood, TX

- Facilities (e.g., project staff use the partner's facilities for project activities)
- Collaboration (e.g. partner's staff work with project staff on the project)

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: N/A.

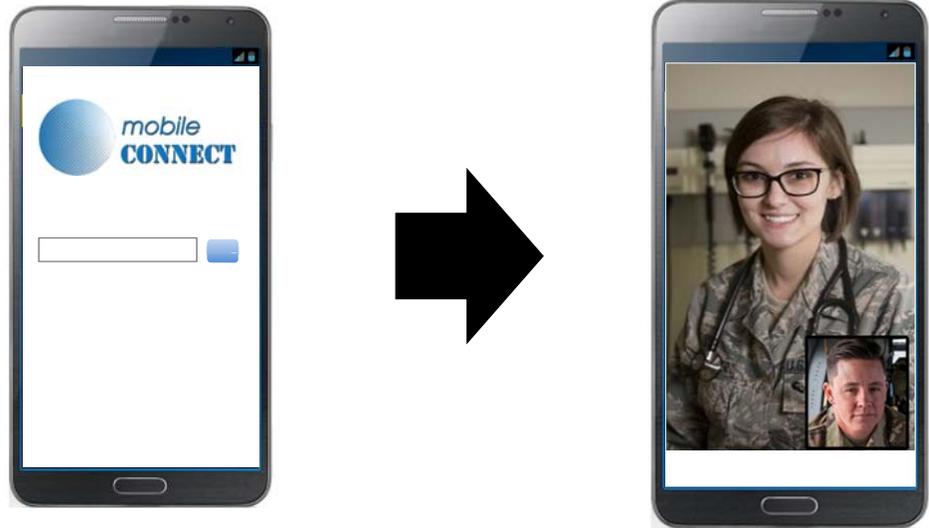
QUAD CHARTS: See Appendix A.

9. APPENDICES: N/A

Appendix A: Quad Chart

Telehealth 2.0; Preserving Continuity of Behavioral Health Clinical Care to Patients Using Mobile Devices

PI: Jeanette Little, MS Co-PIs: Dr. Larry Pruitt/COL Jeffrey Yarvis Org: MPMC TATRC Amount of the Award: \$1,571,021.00

<p>Study/Project Aims:</p> <ol style="list-style-type: none"> 1. Develop the required technology enhancements to the existing mobile health (mHealth) system, to support this project 2. Test the feasibility of the mobile interface for patient use 3. Establish the acceptability of this technology approach with BH providers 4. Deploy and evaluate the technology solution in a clinical context <p>Approach:</p> <p>This project aims to use mobile technology to leverage telehealth services as a means to maximize the continuity-of-care that the military healthcare system (MHS) can provide to Service members when they are engaged in behavioral health (BH) services, but must temporarily relocate due to the requirements of their military service. The effort will focus on utilization of the patient's personal mobile device in an approved, secure fashion to maintain the established therapeutic relationships with their BH provider(s) during an outside the continental United States (OCONUS) temporary duty assignment (TDY) using a relational model of care delivery to complete a course of treatment that the patient sought out prior to being reassigned.</p>	 <p>Accomplishments: Project was accepted for funding; funding received in the last QTR of FY16; funding transfers to co-PIs and academic partner contracts are currently in progress.</p>																														
<table border="1"> <thead> <tr> <th>Activities</th> <th>CY16</th> <th>CY17</th> <th>CY18</th> <th>CY19</th> </tr> </thead> <tbody> <tr> <td>Develop tech enhancements</td> <td></td> <td align="center">█</td> <td></td> <td></td> </tr> <tr> <td>Test feasibility of mobile interface</td> <td></td> <td></td> <td align="center">█</td> <td></td> </tr> <tr> <td>Establish acceptability of technology approach with BH providers</td> <td></td> <td></td> <td align="center">█</td> <td></td> </tr> <tr> <td>Deploy and evaluation technology solution in clinical context</td> <td></td> <td></td> <td align="center">██████████</td> <td></td> </tr> <tr> <td>Estimated Budget (\$K)</td> <td></td> <td align="center">\$1,024,091</td> <td align="center">\$546,930</td> <td></td> </tr> </tbody> </table>	Activities	CY16	CY17	CY18	CY19	Develop tech enhancements		█			Test feasibility of mobile interface			█		Establish acceptability of technology approach with BH providers			█		Deploy and evaluation technology solution in clinical context			██████████		Estimated Budget (\$K)		\$1,024,091	\$546,930		<p>Goals/Milestones:</p> <ul style="list-style-type: none"> • CY17 Goals – Begin Technology Enhancements/Complete Technology Enhancements/Complete End User Usability Assessment • CY18 Goal – Commence Pilot Project with Ft Hood EBH Team • CY19 Goal – Project Completion <p>Comments/Challenges/Issues/Concerns:</p> <p>DHA HIT VNC is no longer supporting use of the existing desktop VTC software that was proposed for this project, a request was made to leverage the next generation of DHA VNC software on a pilot basis. However this solution did not support the Android operation system, which would have limited patient participation. A final technical approach was selected using a secure connection to the commercial application that is leveraged by the DISA Global Video Services (GVS). This is accessible to the provider at his her desktop without requiring any software to be installed on a .mil computer, and is accessible to the patient through both iOS and Android mobile applications.</p> <p>Budget Expenditure to Date:</p> <p>FY16 Projected Expenditures: \$ 1,024,091 FY16 Actual Expenditures To Date: Obligated: \$558,347.24 / Committed: \$434,193.65 FY17 Projected Expenditures: \$546,930.00</p>
Activities	CY16	CY17	CY18	CY19																											
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