

Development of a CBT-based Mobile Health App to Increase Access to Behavioral Health Services Among Hospital Patients

Jonah Meyerhoff, Rebecca Etkin, Wendi Cross, & Michael Hasselberg



INTRODUCTION

- Many hospital patients have comorbid affective symptoms that impact their physical health and prognosis.
- However, barriers to engaging in traditional psychotherapy often exist.¹
- Computerized and mobile app-based cognitive behavioral treatments have been shown to be effective for treating symptoms and addressing barriers to treatment, however, engagement is often low.²
- Incorporating Virtual Reality (VR) into these protocols may encourage engagement in treatment and subsequently improve health outcomes across hospital patients without access to traditional psychotherapy.³

METHODS

- Worked with an interdisciplinary team to develop and execute interactive CBT-based protocols

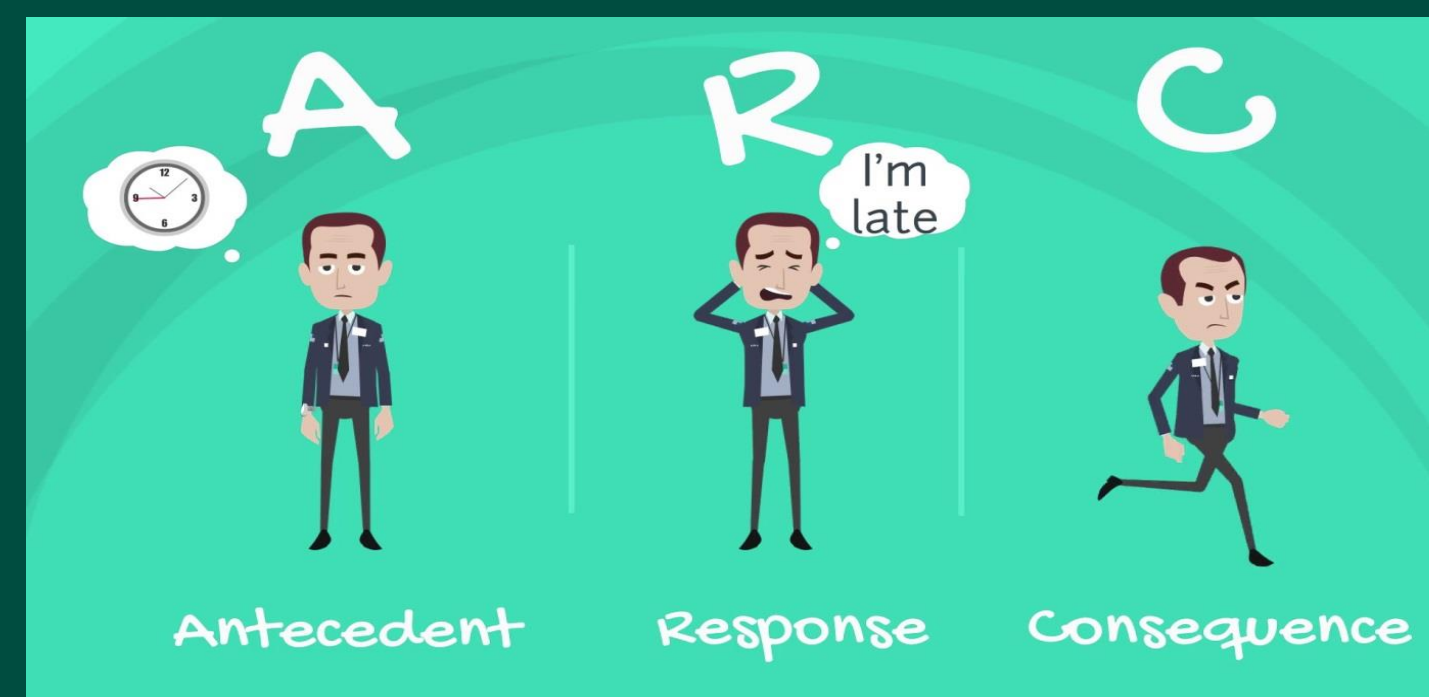
TEAM

- **Michael Hasselberg** - Principal Investigator
- **Wendi Cross** - Principal Investigator
- **Matthew Brown** - Principal Investigator
- **Chris DaSilva** - Project Director
- **Michael Curtis** - Sr. Software Specialist
- **Christopher Winders** - Music and VR effects
- **Mitchell Leadley** - Software Development Intern
- **Katie Schmieder** - Psychology Fellow

CONTENT DEVELOPMENT STRATEGY

- Psychology Interns & Postdoctoral Fellow identify relevant CBT module content.
- Interns build wireframes for psychoeducational and interactive content, to be reviewed/finalized by psychology leadership
- Full interdisciplinary team reviews feasibility of psychology proposal and produces content (animation, music, cinematic, and user interface).

A mobile health app that uses VR can increase access to care.



We would like to thank the following groups and individuals for their support of this project:

The Department of Psychiatry Education Committee; UR Department of Psychiatry Chair's Office; UR School of Medicine & Dentistry, Office of Research; URM, Office of Business Development; UR School of Arts, Sciences, and Engineering AR/VR Pilot Funding; Bruce and Marsha Moskowitz Foundation; Drs. Wendi Cross, Michael Hasselberg, Lauren Decaporale-Ryan, and Katherine Schmieder

APP CONTENT

- **Module 1:** CBT-VR Introduction
- **Module 2:** Cognitive Triangle
- **Module 3:** The A-R-C of Emotions
- **Module 4:** Automatic Thoughts
- **Module 5:** Thinking Traps
- **Module 6:** Challenging Your Thoughts
- **Module 7:** Challenging Behaviors
- **Module 8:** Grounding
- **Module 9:** Wrap Up and Rewards

EXAMPLE MODULE OUTLINE

- PROMIS assessment of anxiety symptoms
- Brief review of prior module
- Introduction of new content, including "face-to-face" time with therapist (VR) and animations
- Interactive activity to practice new content
- Wrap-up and homework, including directions to access additional activities (e.g., mindfulness activities using VR, thought and activity logs)

FUTURE DIRECTIONS

- Conduct feasibility testing
- Assess user experience with the app
- Integrate app into e-record and evaluate physicians' incorporation of app into clinical workflow⁴
- Randomized control trial examining effectiveness of app with VR to another computerized program (without VR) to control group

REFERENCES

1. Vallury, K. D., Jones, M., & Oosterbroek, C. (2015). Computerized cognitive behavior therapy for anxiety and depression in rural areas: a systematic review. *Journal of medical Internet research*, 17(6), e139.
2. Rollman, B. L., Belnap, B. H., Abebe, K. Z., Spring, M. B., Rotondi, A. J., Rothenberger, S. D., & Karp, J. F. (2018). Effectiveness of online collaborative care for treating mood and anxiety disorders in primary care: a randomized clinical trial. *JAMA psychiatry*, 75(1), 56-64.
3. Firth, J., Torous, J., Carney, R., Newby, J., Cosco, T. D., Christensen, H., & Sarris, J. (2018). Digital technologies in the treatment of anxiety: recent innovations and future directions. *Current psychiatry reports*, 20(6), 44.
4. Chan, S., Godwin, H., Gonzalez, A., Yellowlees, P. M., & Hilty, D. M. (2017). Review of use and integration of mobile apps into psychiatric treatments. *Current psychiatry reports*, 19(12), 96.