



# Weill Cornell Medicine

## START – Psychiatric Symptom Tracker and Resources for Treatment

### Lead Inventors:

#### Conor Liston, M.D., Ph.D.

Associate Professor of Neuroscience, Brain and Mind Research Institute, Weill Cornell Medical College

Associate Professor of Psychiatry, Weill Cornell Medical College

Sackler Associate Professor of Developmental Psychobiology, Psychiatry, Weill Cornell Medical College

#### Benjamin Zebley, M.D.

Assistant Professor of Clinical Psychiatry, Weill Cornell Medical College

### Business Development Contact:

Louise Sarup

Associate Director, Business Development and Licensing

(646) 962-3523

[lss248@cornell.edu](mailto:lss248@cornell.edu)

# START – Psychiatric Symptom Tracker and Resources for Treatment

## Background & Unmet Need

- The COVID-19 pandemic put an extreme burden on frontline healthcare workers: recent data suggests that nearly half of them are at risk of developing clinically significant psychiatric symptoms
- It is unclear how mood, anxiety, and trauma symptoms develop over time and why some individuals are affected, while others exposed to the same stressors and traumas are spared
- Most studies and monitoring tools rely solely on self-reported assessments of mood, anxiety, and trauma, and are noisy and subjective
- Identifying modifiable risk factors could help support healthcare workers and other at-risk populations and design effective interventions
- **Unmet Need:** Tools for healthcare workers and other people at risk for adverse psychiatric outcomes to monitor their mental health and access convenient treatment options

## Technology Overview

- **The Technology:** An efficient, easy-to-use online tool that objectively measures mood, anxiety, and trauma symptoms, provides immediate feedback to participants, allows tracking mental health over time, and connects users with existing mental health resources
- The START tool was developed using novel machine learning methods and a large dataset of fMRI scans of >1,200 patients with mood and anxiety disorders
- Self-reported clinical symptoms are denoised using a proprietary method and projected into a low-dimensional space constrained by brain biology, producing quantitative scores reliably quantifying mood-related brain circuit functions
- **PoC Data:** In a pilot study, implementation of START led to a significant increase (>2x) in utilization of urgent counseling services, leading to numerous referrals

## Inventors:

Conor Liston  
Ben Zebley

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## Publications:

Lee et al. *World Economic Forum*. 2020.

## Biz Dev Contact:

Louise Sarup  
(646) 962-3523  
[lss248@cornell.edu](mailto:lss248@cornell.edu)

## Cornell Reference:

D-9771

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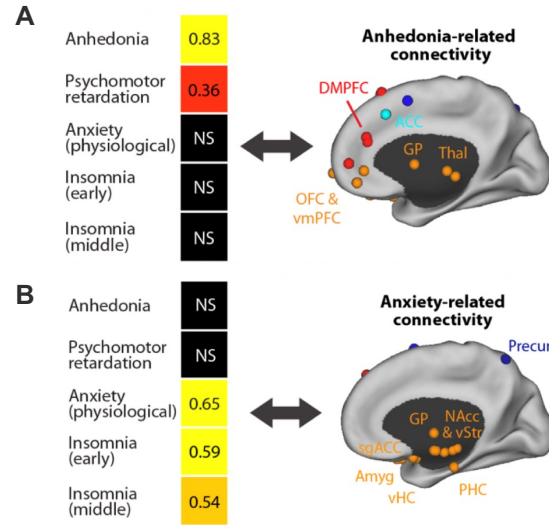
## Technology Applications

- Monitoring mental health state of healthcare workers and other at-risk populations
- Connecting at-risk individuals to treatment resources
- Personalized cognitive behavioral therapy in conjunction with digital mental health apps
- Providing measurable psychiatric endpoints in clinical trials for drug development
- Studying psychiatric symptoms in large populations

## Technology Advantages

- Instant, easily understood feedback and psychiatric scores on mood, anxiety, sleep, stress, trauma, and burnout risk
- Symptom scores can be tracked over time
- Questions are adaptively selected to generate reliable validated scores in the shortest time
- Data is denoised using proprietary machine learning algorithms, making predictions more reliable

## Supporting Data / Figures



**Figure 1:** Screening tool is based on distinct patterns of brain connectivity associated with depression symptoms: anhedonia<sup>1</sup> (A) and anxiety (B)

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