Suicide is a leading cause of death in the United States, and is the second most common cause of death in the United States military. The rise in suicide rates in the U.S. military and general population during the past decade highlights the need for improved clinical and preventative efforts. Between 2001 to 2010, only 45% of military personnel who died by suicide kept an outpatient medical appointment in the 30 days preceding their deaths, suggesting the majority of military personnel and veterans do not seek out medical care immediately before their suicides. When medical care is sought, the most frequently-visited clinic types preceding service members’ deaths by suicide are to primary care and general medical clinics, however, not mental health clinics. This pattern is mirrored in the US general population, further highlighting the need for new methods to detect and identify at-risk individuals who are not actively engaged in mental health care. Unfortunately, converging evidence indicates that 50-67% of individuals who die by suicide do not report or otherwise deny suicidal intent in the time leading up to their deaths. Tragically, even when individuals do report suicide ideation or intent, they are unlikely to receive effective therapy. My research program has focused on these two interrelated aspects of suicide prevention: (1) improving risk detection by developing new methods that circumvent the high false negative rate, and (2) improving the efficacy of treatments for suicidal individuals.

Over the past two years, my research program has increasingly focused on identifying solutions to this problem of false negatives based upon the concepts of the fluid vulnerability theory (FVT) of suicide. The FVT explicitly views suicide risk as inherently dynamic over time, which explains in part why it is so difficult to reliably predict suicide attempts at any given moment. FVT conceptualizes suicide risk on two dimensions: chronic and acute. Chronic risk includes static risk factors (e.g., past suicide attempts, history of trauma, past psychiatric illness) and trait-based belief systems (e.g., self-hatred, shame) that serve as persisting vulnerabilities to suicide risk over time, even when an individual is in a period of relative calm or a “low risk” state marked by low emotional distress. Acute risk, by contrast, includes relatively transient, state-based thoughts and emotions (e.g., depression, hopelessness, suicidal ideation) that can fluctuate over time. According to FVT, the predictive accuracy of suicide risk assessment is improved by considering both chronic and acute risk dimensions simultaneously. From the perspective of FVT, current suicide screening methods suffer from poor accuracy and reliability because they focus on only the acute dimension. Unfortunately, research suggests individuals with elevated chronic risk experience greater fluctuations in emotional distress and suicidal ideation on a day-to-day basis (see Figure). If assessed during periods of relative calm, higher risk patients will therefore look no different from low risk patients, resulting in a screening “miss” (i.e., false negative). From a treatment perspective, FVT implicates the importance of targeting chronic risk factors, notably emotion regulation deficits and trait-like beliefs, in order to reduce long-term vulnerability for suicide attempts.
Improving self-report screening methods
In the area of self-report screening, my research program has focused on adapting a novel assessment tool based on the FVT: the Suicide Cognitions Scale (SCS). The SCS was specifically designed to measure the chronic dimension of suicide risk proposed by FVT through the assessment of underlying beliefs such as perceived burdensomeness, self-hatred, and distress intolerance. Our preliminary work with this measure indicates that it differentiates between military personnel with and without a history of suicide attempt, and predicts future suicide attempts better than other suicide risk factors including suicide ideation and past suicide attempts. We have recently been funded by the Department of Defense to test the efficacy of the SCS as a new suicide risk screening measure in military primary care clinics. This $3.6M grant will enroll 5,000-20,000 military personnel and family members at three separate military installations, and will be the first prospective study of a suicide screening tool in primary care.

The Durkheim Project: Natural language processing of social media
The Durkheim Project consists of three phases. During the first phase, a clinician’s dashboard was built and a Veterans Affairs (VA) predictive risk medical records study was completed based on an analysis of the narrative, or free text, portions of VA medical records. Results of this project, recently published in PLOS ONE, indicated that analysis of unstructured medical notes could significantly differentiate suicide cases from controls with 67% accuracy. During the second phase, now underway, opt-in social media postings are being collected and will be analyzed to determine if natural language processing can be used to detect risk among military personnel and veterans who are not necessarily engaged in treatment. This phase is being completed in collaboration with Facebook and Dartmouth College. During the third phase, a pilot program will isolate serious suicide risk for individuals in real-time, and develop a prediction triage model for improved suicide intervention. A $1.8M grant proposal for phase three is currently under review with the Veterans Affairs Center for Innovations (VACI).

POS REP: Use of smart phone technology to detect risk
Using GPS technology, POS REP is a smart phone app developed to help veterans locate other veterans as well as professional support services. We have been in conversations with the developers of POS REP to research the app’s utility as a mental health tracking tool among veterans who may not be engaged in treatment. To this end, several projects have been proposed for funding. In phase one, we seek to validate POS REP user metrics as behavioral indicators of constructs relevant to mental health (e.g., insomnia, depression, social support); this phase one study is currently under review for University of Utah Seed Grant Funding. In phase two, we seek to conduct a prospective study of POS REP user metrics as a system for tracking and monitoring suicide risk factors and mental health; this phase two study is being submitted to the Infinite Hero Foundation for funding ($100K).

Brief interventions to reduce suicide attempts
We recently completed our $2M randomized controlled trial of brief cognitive behavioral therapy (BCBT) to prevention suicide attempts among military personnel, with results indicating that Soldiers receiving BCBT were 60% less likely to make a suicide attempt during the 2-year follow-up as compared to Soldiers receiving treatment as usual. A second RCT currently underway ($1.1M) has also yielded positive preliminary results. These findings will lead to contracts to produce the treatment manual and disseminate the treatments across the DOD.