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Suicidal Crisis and Suicide Warning Signs

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by

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2012

DEDICATION

This amazing adventure would not have been possible without
the encouragement and support of my husband,
Dr. Vance (Bud) McClure, and son, Paul.

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The text of Chapter Two, in part, will be submitted for publication as: McClure, J., Zisook, S., Criqui, M., Macera, C., and Nievergelt, C. (2012). "Prevalence of Suicide Warning Signs in Veterans Attending a Psychiatric Emergency Clinic"

The dissertation author was the primary researcher and author.

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ABSTRACT OF THE DISSERTATION

Suicidal Crisis and Suicide Warning Signs

by

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Doctor of Philosophy in Public Health (Epidemiology)

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When making life and death decisions about when to hospitalize an individual who may be at risk for suicide, a clinicians' choice often relies more on 'best guesses' than on solid, evidence based knowledge. While there is extensive evidence about long term risk factors that predict lifetime risk but not necessarily immediate danger to self, far less is known about sub-acute risk factors, predictors of serious suicidal behaviors within weeks to months. Even less is known about acute risk factors, predictors of serious suicidal behaviors within hours to days. We examined the prevalence of acute risk factors (suicide warning signs) in a high-risk population of veterans. We also examined agreement between self-report (a self-administered survey), and psychiatrist report, of the suicide warning signs of suicidal ideation (SI) and behaviors. We then looked

at whether any single or cluster of suicide warning signs differentiated veterans who were hospitalized for a suicide attempt (SA) or severe SI the day of the survey, from all other veterans in the study. We also looked at whether suicide warning signs or other characteristics were associated with an SA or hospitalization for severe SI in the following 12 months. Participants were 430 men and 52 women who presented to the walk-in Psychiatric Emergency Clinic at the Veterans Administration Health Care System in San Diego, California between January and May 2010.

In the prevalence portion of the study we found that more than half (52%) of participants reported SI or suicidal behaviors in the past week. Other suicide warning signs were also highly prevalent with the lowest prevalence, 19%, for ‘hurt self’ or ‘reckless behavior’. Prevalences of suicide warning signs were significantly higher for veterans with a major depressive episode (MDE by PHQ-9 score), positive screening for post-traumatic stress disorder (PTSD), or both, compared to none.

Agreement between self-report and psychiatrists’ report of SI and behavior was generally low with veterans rating SI and suicidal behaviors as significantly more severe than psychiatrists. Veteran ratings were consistently more severe than psychiatrists ratings even when veterans with characteristics that may have led to over-reporting (*e.g.* homelessness) were removed from the analysis.

In univariate analysis, many of the individual suicide warning signs and the two clusters of warning signs formed from factor analysis, were strongly associated with immediate hospitalization for a suicidal crisis (SA or severe SI). In addition, a smaller number of warning signs and clusters were also associated with a suicidal crisis in the following 12 months albeit at a much lower magnitude in both univariate and multivariate analysis. In multivariate analysis, veterans who were hospitalized immediately had 13 fold higher odds of self-reporting feeling out of control compared to veterans not hospitalized immediately.

The clinical utility of warning signs is attenuated by the high prevalence of all of the warning signs in veterans who were not hospitalized immediately

or in the 12 month follow-up study. Moreover, only 3.1% of veterans ($n = 15$) did not endorse any warning signs and the mean number of signs endorsed was 7.6. When history of SA was included with the suicide warning signs, only 2.3% ($n = 11$) did not make any endorsements. Overall the frequency of the suicide warning signs was highest in veterans hospitalized for SI or SA the day of the survey, intermediate for veterans hospitalized during the 12 month follow-up and lowest for veterans with no SA or hospitalization during the study period.

Chapter 1

Introduction

1.1 Suicide prevention and acute risk

Suicide is a major public health problem. More than 34,000 Americans die each year from suicide making it the 11th leading cause of death in the United States (Center for Disease Control and Prevention, 2008). Recent reports of increasing suicide rates among the armed forces and military veterans (Kang and Bullman, 2009) have led to renewed calls for more effective prevention (United States Department of Defense, 2010). Prevention in the mental health clinical setting is focused on assessment of acute risk, the risk in the coming hours to days. As yet however, no acute risk factors have been established that are sensitive and specific enough to guide clinical decisions (Berman, 2007; Hendin et al., 2010a).

1.2 Proposed suicide warning signs

Recently an American Association of Suicidology (AAS)-sponsored panel proposed a set of suicide warning signs to help clinicians address an individual's acute risk (Rudd, 2008; Rudd et al., 2006). The panel defined the time frame for these warning signs as hours to days in contrast to sub-acute risk which encompasses weeks to months, or long-term risk, a year or more. In proposing their warning signs of acute suicide risk, the AAS recognized that there is little research to guide the selection of specific warning signs and state that they

chose “those variables with the most promise and immediate impact on clinical practice”.

They suggested that although there is some overlap suicide warning signs differ from long-term risk factors in a number of clinically important ways. Warning signs are factors that are most proximal in time to a suicide attempt or death by suicide (hours to days), have meaning as a constellation rather than individually, are episodic with fluctuation over time, and are more amenable to intervention than are long-term risk factors. In contrast, long-term risk factors such as history of suicide attempts and a psychiatric disorder confer risk individually, are present in a steady state over years, and are difficult to modify. In addition to the AAS suicide warning signs, included in the present study are warning signs suggested by the work of Hendin and colleagues (Hendin et al., 2007).

Suicide warning signs can be conceptualized as falling into three categories; suicidal ideation (SI) and directly related behaviors such as preparation of a suicide plan, intense affective states (painful sustained emotions), and indirectly related behavioral changes. Table 1.1 provides a summary of the warning signs by category and the corresponding survey question for the present study.

1.3 Literature Review

1.3.1 Warning signs: suicidal ideation and directly related behaviors

Suicidal ideation (SI) is relatively common; SI is considered passive ideation if the individual has the wish to be dead and active if the individual has the desire to commit suicide. In a nationally representative sample, 13.5% had “ever seriously thought about committing suicide” at some point in their life and 3.9% reported that they had ever made a suicide attempt (Kessler et al., 1999). Suicidal ideation and behaviors (such as preparing a suicide plan) are more common in individuals with a psychiatric or substance use disorder

Table 1.1: Survey questions corresponding to AAS warning signs and Hendin's additional signs

Category 1. Suicidal ideation and behaviors directly related to suicide

AAS Warning Signs^a

Talking or writing about death, dying, or suicide

Looking for ways to kill oneself, seeking access to pills, weapons or other means

Threatening to hurt or kill oneself

Corresponding Survey Questions

Having thoughts that you would be "better off dead" or thoughts of physically harming yourself ?^c
Wished to be dead?

Thought about taking your own life?

Planned ways of taking your own life?

Made preparations (for example saving up pills or getting a gun)?

Not assessed

Category 2. Intense affective states

AAS Warning Signs^a

Anger, rage, seeking revenge

Anxiety or agitation

Hopelessness

No reason for living, no sense of purpose in life

Feeling trapped-like there's no way out

Dramatic changes in mood

Corresponding Survey Questions

Feeling rage or intense anger?

Feeling intensely anxious or having anxiety attacks?

Feeling hopeless?

Not assessed

Feeling trapped, no way out?

Feeling dramatic changes in mood (for example from energetic and happy to depressed or angry)?

Additional Warning Signs by Hendin

Desperation

Abandonment

Self-hatred

Loneliness.

Corresponding Survey Question

Feeling desperate (an urgent need for relief)?

Feeling abandoned by others?

Feeling of intense self-hatred?

Not assessed

Category 3. Behavioral changes indirectly related to suicide

AAS Warning Signs^a

Increased alcohol or drug use

Insomnia or hypersomnia

Acting recklessly or engaging in high

risk activities, seemingly without thinking, Hurt yourself or put your life in imminent danger?

Withdrawing from friends, family, or society. Withdrawing from your family, friends, life in general?

Corresponding Survey Questions

Are drinking more alcohol [than usual]?

Are using drugs more often [than usual]

(other than those ordered by your doctor)?

Having trouble falling or staying asleep or sleeping too much ?^c

^aAAS American Association of Suicidology sponsored panel suicide warning signs

^bAdditional warning signs based on the work of Hendin and colleagues.(H. Hendin, Maltzberger, Haas, Szanto, & Rabinowicz, 2004)

^cAll survey questions ask about experiences and behaviors during the past one week except questions from the PHQ-9 which ask about the past two weeks.

than in the general population (Kessler et al., 2005). In a study of 1,000 consecutive psychiatric outpatients, 54% reported current passive ideation, 38% current active ideation, and 22% a current suicide plan (Zisook et al., 1994).

Suicidal ideation and direct behaviors however are not specific to acute, sub-acute or long-term risk because they may be present episodically for long periods of time without manifesting as a suicide attempt or death by suicide, (Sher, 2004) or be so fleeting that they are not recalled after a suicide attempt (Hall and Platt, 1999). Individuals may also conceal or deny SI or suicidal behaviors, such as purchasing a gun, to prevent intervention (Busch et al., 2003) making it important to identify additional warning signs that are more readily observable by others (Hendin et al., 2010b; Rudd, 2008).

1.3.2 Warning signs: intense affective states

A number of studies have found intense affective states to be present in a severe form up to 3 months prior to a suicide attempt or death by suicide. In their study of 100 individuals who made a severe suicide attempt, Hall and colleagues found that severe anxiety, panic attacks, and hopelessness were predictors of death by suicide (Hall and Platt, 1999). A chart review of 76 individuals who died from suicide in the hospital or shortly after discharge found that 79% met criteria for severe or extreme anxiety and/or agitation (Busch et al., 2003). Psychological autopsies of 40 inmates who died from suicide found that 70% displayed agitation or anxiety prior to their death (Way et al., 2005). Of 100 individuals who died from suicide in Britain almost two-thirds looked anxious and one-third complained of anxiety, almost half felt hopeless, and one-third were visibly restless according to their significant others (Barraclough et al., 1974). A British study of 12 inpatients who died from suicide within two months of discharge found significant anger directed at others, restlessness, and episodic screaming were present during their hospital admission (Morgan and Priest, 1984).

Hendin and colleagues compared 26 individuals who died by suicide to 26 depressed but non-suicidal individuals. The treating therapists provided data

retrospectively (between two years and "many" years) after their patient died from suicide. Six of the nine intense affective states examined were found to be present significantly more often in those who died: desperation 85% *vs.* 0%, hopelessness 58% *vs.* 8%, rage 69% *vs.* 19%, abandonment 58% *vs.* 12%, self-hatred 42% *vs.* 8%, and anxiety 62% *vs.* 27% (Hendin et al., 2004). In a follow-up paper, they concluded that the "most potent indicators" of acute risk are the intense affective states of desperation, feelings of abandonment, self-hatred, and loneliness (Hendin et al., 2007). The feeling of being trapped with no way out, and no "reason for living and no purpose in life" (Rudd et al., 2006) can also be considered intense affective states.

A number of studies that examined the role of affective states by asking individuals to endorse one or more reasons for their attempt, found high rates of intense affective states. For example from 44% to 90% of participants endorsed to "get relief from a terrible state of mind," 56% to 83% to "escape for awhile from an impossible situation" and 56% to 83% to deal with a situation "so unbearable that you had to do something and you didn't know what else to do" as reasons for attempting suicide (Bancroft et al., 1979; Bancroft et al., 1976; Hjelmeland et al., 2002; Schnyder et al., 1999; Williams, 1986).

Intense affective states can manifest more generally as dramatic changes in mood (*e.g.* from energetic and happy to depressed and angry). Dramatic changes in mood are particularly associated with a mixed state depression in individuals with bipolar disorder. Mixed state depression is depression "mixed" with agitation in the form of restlessness, talkativeness, and/or irritability (Rihmer et al., 2007). and carries a higher risk of suicide attempts (Simon, 2006).

The onset of intense affective states leading to suicidal behavior can occur gradually or suddenly in situations of loss such as a spouse announcing they want a divorce, being fired from a job, or public humiliation (Hendin et al., 2001; Trainor, 1996).

1.3.3 Warning signs: behavioral changes indirectly related to suicide

An increase in alcohol or drug use is a common behavioral change prior to a suicide attempt or death by suicide. Between one-third and two-thirds of individuals who attempt suicide or die from suicide have been drinking in the prior 24 hours (Cherpitel et al., 2004; Chiles et al., 1986; Hall and Platt, 1999). In addition, Hendin and colleagues found that any pre-existing problem with alcohol abuse worsened immediately prior to a suicide attempt or death by suicide (Hendin et al., 2007).

Although alcohol use has been the focus of most research and may carry a higher risk, drug use also increases risk (Dhossche, 2000). Cornelius and colleagues conducted a study of 41 inpatients with a diagnosis of both major depression and alcohol dependence. Seven had made a suicide attempt during their current depressive episode (Cornelius et al., 1996). Increased alcohol abuse at the time of their death from suicide was found in 5 of 9 individuals with a history of substance abuse (Hendin et al., 2001). Hall and colleagues reported that recent abuse of alcohol or illicit substances was a predictor of suicidal behavior among 100 patients who made a severe suicide attempt (Hall and Platt, 1999).

Changes in sleep pattern has also been identified as common prior to suicidal behaviors. In the same study, Hall and colleagues found that 92% of study participants had partial insomnia and 46% had global insomnia prior to their suicide attempt. A psychological autopsy of 100 adults who died from suicide found that 76% had insomnia (Barraclough et al., 1974). Fawcett identified severe insomnia with clinical depression as a warning sign in addition to severe emotional pain, agitation, and panic attacks (Fawcett, 2007).

No published studies were found on withdrawal from others or reckless behaviors as risk factors or warning signs.

1.3.4 Agreement between self and clinician report of suicidal ideation and behaviors

Studies suggest that communication of risk for suicidal behavior between psychiatric care settings is not always sufficient (Coombs et al., 1992; Malone et al., 1995) suggesting that either assessment of risk or documentation of the assessment results is not always systematic (Simon, 2006). A psychiatric assessment by psychiatrists is traditionally by unstructured interview (Simon, 2006) with few mental health clinicians using structured formats (pre-determined questions asked in a specified order) or semi-structured formats (predetermined content areas but the clinician decides how and in what order to explore the predetermined areas) (Jobes et al., 1995). This is also true for the assessment of suicide risk, a part of the psychiatric assessment (Bongiovi-Garcia et al., 2009).

The few available studies of suicide risk assessment formats suggest that structured or semi-structured formats identify SI at a higher rate than unstructured assessments. Thirty percent of inpatients with major depression identified as having current SI by a structured assessment were not identified as such during an unstructured assessment by the psychiatric resident (Bongiovi-Garcia et al., 2009). In a psychiatric emergency clinic, 62% of visitors reported SI on a self-administered survey while clinicians using an unstructured format rated only 37% as “suicidal” (Healy et al., 2006).

Structured assessments compared to unstructured assessments, have also shown higher rates of detection for suicide risk factors such as psychiatric and substance use disorders (Magruder et al., 2005; Ramirez Basco et al., 2000; Szuster et al., 1990; Woodward et al., 1991) and a history of suicide attempts (Bongiovi-Garcia et al., 2009; Malone et al., 1995). When the same structured assessment of past and current suicidal ideation and behaviors was self-administered by the patient and then administered by the clinician, agreement was good for all questions (Kaplan et al., 1994). A self-administered structured assessment may in fact be more predictive of future “suicidality” than the clinician assessment (Joiner et al., 1999).

1.4 Summary of rationale and aims

Suicide is a complex phenomenon and to date prevention efforts have not decreased overall rates. Thirty-five years ago, a task force for the newly established Center for Studies of Suicide Prevention at the National Institutes for Mental Health in Washington, DC, called for a research focus on signs of acute risk. The task forces' recommendation has received little attention until recently (Berman, 2007). In 2006, an expert consensus panel for the American Association of Suicidology addressed this important clinical issue by setting forth a set of warning signs and proposing a research agenda (Rudd, 2008). The present study attempted to contribute to research on this important area of suicide prevention.

We created a self-administered survey of suicide warning signs and asked veterans attending the Veterans Administration(VA) San Diego Medical Center Psychiatric Emergency Clinic (PEC) to complete the survey. We then determined the prevalence of each suicide warning sign and explored associations with clinical and sociodemographic variables included in the survey.

We also determined the degree of agreement between the veterans' self-report and the treating psychiatrists' report of the warning signs SI and behaviors. The hypothesis was that veterans would report higher rates of these suicide warning signs than the psychiatrists. Finally, we examined the association of the suicide warning signs, singly, or in clusters determined by factor analysis, to a suicide attempt or hospitalization for severe SI on the day of the survey and over the following 12 months. We hypothesized that there will be a positive relationship between specific risk items and factors and hospitalizations for SI or SA.

1.5 Enumeration of chapters

The second chapter of this manuscript reports on the prevalence of suicide warning signs and their association with current major depression (MDE) and post traumatic stress disorder (PTSD) as assessed in the self-administered survey.

The third chapter reports on the level of agreement between the veteran and the psychiatrist on the presence of passive SI, active SI, a suicide plan, and plan preparation. Agreement is also examined by psychiatrist status (second year resident or staff physician), the veteran's MDE status, and whether the psychiatrist documented the presence or absence of a history of a suicide attempt.

The fourth chapter of this manuscript examines an association between suicide warning signs and sociodemographic and clinical characteristics, with a suicide attempt or hospitalization for severe SI (event). Events that occurred the day of the survey and those during the 12 month follow-up period were analyzed separately.

The appendices to this manuscript provide additional study method details (Appendix Figures A.3, A.1, and A.2) and a copy of the survey (Appendix A.6).

Chapter 2

Warning Signs in Veterans Attending a Psychiatric Emergency Clinic

2.1 Introduction

Suicide is a major public health problem worldwide. More than 34,000 Americans die each year from suicide making it the 11th leading cause of death in the United States (Center for Disease Control and Prevention, 2008). Recent reports of increasing suicide rates among the armed forces and military veterans (Kang and Bullman, 2009) and have led to renewed calls for more effective prevention (United States Department of Defense, 2010). Prevention in the mental health clinical setting is focused on assessing acute and long-term risk. Long-term risk factors which convey risk over many years, are well known and include the presence of a psychiatric illness, a substance use disorder (SUD), and a history of a suicide attempt (SA). However, less is known about the emotions, feelings, and behaviors that increase risk over the coming hours to days (acute risk), the time frame most relevant to clinicians.

An American Association of Suicidology sponsored panel proposed a set of suicide warning signs that address acute risk. They recognized that for clinicians who must make decisions about the safety of their patients in the coming hours to days, research based suicide warning signs would be of great value (Rudd et al., 2006). They suggested that although there is some overlap, suicide warning signs differ from long-term risk factors in a number of clinically

important ways. Among the differences is the potential to immediately modify acute risk factors such as anxiety and insomnia, thus reducing risk (Fawcett et al., 1991).

Because few studies focus on acute risk there is little research to guide the selection of specific warning signs and thus Rudd and colleagues chose “variables with the most promise [for eventual scientific verification] and immediate impact on clinical practice” (Rudd, 2008; Rudd et al., 2006). Not only have few studies examined any aspect of acute risk factors, but even fewer have assessed the specificity of *acute* risk factors to individuals at risk of a suicide attempt or death by suicide by also evaluating intense affective states in individuals without suicidal behavior. (For example (Hendin et al., 2007).)

The proposed suicide warning signs can be seen as comprising three broad categories: 1) suicidal thoughts and direct behaviors; 2) behaviors indirectly related to suicide; and 3) intense feelings or emotions (affective states). Suicidal thoughts include passive ideation (the wish to be dead) and active ideation (thoughts of committing suicide including making a plan). Suicidal behaviors include preparing a suicide plan such as purchasing a gun. Indirect behaviors are acting recklessly or engaging in risky activities; withdrawing from family, friends, and society; inability to sleep or sleeping excessively; and increased drug or alcohol use. Intense affective states are anxiety, agitation, anger, rage, feeling trapped, hopelessness, and dramatic changes in mood.

For the present study we added the affective states of desperation, abandonment, self hatred, and feeling out of control (Hendin et al., 2007) for a total of 18 warning signs. Intense affective states are manifestations of psychological pain, the “basic ingredient of suicide” (Shneidman, 1996) and thus important to identify (Jobes, 2006). Moreover, Hendin and colleagues found that the presence of intense affective states was one of the three factors that usually occurred before a death by suicide (Hendin et al., 2010b).

Toward the goal of validating the proposed suicide warning signs, we examined the prevalence of suicide warning signs in a sample of individuals with a range of past and current states of suicidal ideation (SI) and behaviors.

We chose a Veterans Administration psychiatric emergency clinic (VA PEC) for our study setting because VA PEC visitors represent a heterogeneous population that includes veterans at high risk of SI and behaviors such as recent returnees from Iraq and Afghanistan (Kang and Bullman, 2008) and veterans with acute and chronic psychiatric or substance use disorders (Ilgen et al., 2010). We used a self-administered survey to determine the prevalence of SI and behaviors as well as other suicide warning signs in veterans attending the PEC. We also explored sociodemographic and clinical characteristics, such as a current major depressive episode (MDE) that might be associated with suicide warning signs.

2.2 Methods

2.2.1 Setting

The San Diego VA PEC is part of the San Diego VA medical center and is open weekdays from 8 AM to 5 PM. The clinical staff includes a psychiatric nurse (PEC coordinator), a second year psychiatric resident, an attending psychiatrist, and a pharmacist specializing in psychiatric pharmacology. The PEC coordinator determines whether the veterans' needs are best met through a complete PEC evaluation or through other means. Alternate dispositions include a same day appointment with their regular psychiatrist, an alcohol and drug treatment intake, a prescription refill provided by the psychiatric pharmacist, or a full mental health intake through the Same Day Access Clinic.

2.2.2 Sample

Participants were veterans who checked into the PEC between January and May of 2010. Exclusion criteria were previous enrollment in the study; a medical record flag for history of violent behavior; acute intoxication; a diagnosis of dementia, acute psychosis, or confusion; visible intense agitation or anger; and impaired decision-making capacity by formal or informal evaluation. Out of

911 total visits to the PEC during the five month study period, 154(17%) were repeat visits leaving 757 unique veteran visits. Of these 757 veterans, 38 could not be accessed by the researcher and 107 did not qualify, leaving 612 veterans who met study criteria. Of these 612 veterans, 106 (17%) refused to participate, 18 who gave consent were unable to complete the survey, and 6 with unusable surveys leaving a final sample size of 482. Compared to all veterans seen in the PEC in June of 2010, study participants were significantly younger (46.6 *vs.* 49.3 years of age, $p = .016$), but did not differ by gender or service war era.

2.2.3 Protocol

The study was approved by the University of California, San Diego institutional review board (IRB) and the San Diego VA research committee. In accordance with California state law and IRB requirements, veterans were informed during the consent process that endorsement of any current (SI) or behavior on the survey or verbally would be reported to the PEC clinical staff. Following consent, veterans were asked to complete the self-administered survey. This was generally done before assessment by the clinical staff (usually both the coordinator and the psychiatrist) but if time did not allow, the veteran completed the survey between or after assessments by the clinical staff.¹ The survey included questions about eighteen suicide warning signs, a history of SI or SA², and sociodemographics as well as validated instruments to assess for the clinical characteristics of MDE, alcohol misuse, and post traumatic stress disorder (PTSD).

¹The researcher was aware that some veterans were prevented from completing the survey by being called in to be seen by a member of the clinical staff. This inconsistency in study protocol could not be prevented due to the need for the PEC to continue to function efficiently and the importance of not delaying veterans' care. Unfortunately the researcher was not able to stay with the veteran and track when the survey was completed in relation to assessment by the clinical staff due to the volume of veterans coming into the PEC and limited resources available to the researcher.

²*History* of SI or SA are long-term risk factors.

2.2.4 Measures

Suicide Warning Signs

The suicide warning signs survey items were a modified version of the Depression and Suicide Screening Project Survey developed by experts at the American Foundation for Suicide Prevention (Appendix A.5) (Garlow et al., 2008). Participants were asked to rate on a four point scale (not at all, several days, more than half the days, and nearly every day) feelings of intense anxiety or anxiety attacks, intense agitation, intense anger or rage, feeling hopeless, feeling desperate (an urgent need for relief), feeling out of control, feeling trapped with no way out, feeling abandoned by others, intense self-hatred, and dramatic changes in mood (for example from energetic and happy to depressed or angry) in the past week. In addition, they were asked on a four point scale (not at all, once, 2–3 times, and more than 3 times) if during the past week they had ‘taken prescription medications your doctor did not order or more than your doctor ordered’, or ‘used drugs (such as marijuana, cocaine etc).’ Using the same scale, participants were then asked if during the past week they had ‘wished to be dead,’ ‘thought about taking your own life,’ ‘hurt yourself or put yourself in danger,’ ‘planned ways of taking your own life,’ or ‘made preparations (for example saving up pills or getting a gun’).

Participants were asked to use the same scale to answer whether over their entire life they had a ‘period of two weeks when you felt you wanted to die,’ ‘felt so low you thought about committing suicide,’ ‘have you ever made a suicide attempt’ and ‘if so, how many times.’ Finally, participants were asked whether or not during the past week they were ‘drinking more alcohol,’ ‘using drugs more often,’ or were ‘withdrawing from family, friends, and life in general.’

Major Depressive Episode (MDE)

To assess current MDE we asked participants to complete the nine question Patient Health Questionnaire 9 (PHQ-9). The PHQ-9 has been validated in two large multi-site studies (Spitzer et al., 1999; Spitzer et al., 2000). The

PHQ-9 asks about symptoms during the past two weeks based on the DSM-IV (American Psychiatric Association, 1994) criteria for a major depression. We increased the threshold for frequency of symptoms from ‘more than half the days’ to ‘nearly every day’ so that only the participants most likely to have a clinically meaningful MDE were included. MDE was considered present if the respondent endorsed ‘feeling down or depressed or hopeless’ or ‘feeling a lack of interest or pleasure in doing things’ nearly every day and endorsed five or more questions as ‘nearly every day’ in the past two weeks. The question regarding SI is considered positive if several days or more frequent is endorsed (Kroenke et al., 2001). Depression severity was measured using the PHQ-9 total score with 0-4 considered no depression, 5-9 mild, 10-14 moderate, 15-19 moderately severe, and 20-27 severe depression (Kroenke et al., 2001).

Alcohol Misuse

To assess for alcohol misuse (hazardous drinking or an alcohol use disorder, (AUD) we asked participants to complete the three-question Alcohol Use Disorders Identification Test (AUDIT-C). The AUDIT-C is a screening instrument that has been validated in VA veterans (Bush et al., 1998) and the general population (Dawson et al., 2005). Alcohol misuse was considered present if the total score was ≥ 5 for men and ≥ 4 for women (Dawson et al., 2005).

Post Traumatic Stress Disorder (PTSD)

To assess for PTSD we asked participants to complete the four-question Primary Care Post Traumatic Stress Disorder scale (PC-PTSD) (Prins et al., 2003). The PC-PTSD is a screening instrument that has been validated in primary care (Prins et al., 2003) and other populations such as soldiers returning from combat (Bliese et al., 2008), and VA veterans in treatment for a substance use disorder (Kimerling et al., 2006). The screen was positive if the total score was equal to 3 (Prins et al., 2003).

Sociodemographics and psychiatric and substance use disorders

As part of the survey participants completed sociodemographic questions. In addition, age, gender, and service war era were extracted from the medical record.

2.2.5 Statistical analysis

Frequencies and cross tabulations were used to determine the prevalence of suicide warning signs. Variables for SI and behaviors were based on the survey items that asked about passive SI, active SI, having a plan, and preparation of a plan during the past one week and the single PHQ-9 item about past two week passive and active SI “thoughts ‘that you would be better off dead’ or thoughts of physically harming yourself.” The item about hurting yourself or putting your life in imminent danger was grouped under indirect rather than direct suicidal behaviors in the analysis as it was not clear whether veterans who endorsed this were involved in self-harm with no suicidal intent, such as cutting, and because a number of homeless veterans stated that they considered merely living on the street as putting themselves in imminent danger.

Veterans who endorsed the PHQ-9 item about passive and active SI during the past two weeks but did not endorse any active SI during the past week were considered to have as passive SI only. The variables for active SI, a suicide plan, and preparation of plan were based only on the past week questions and were analyzed in a mutually exclusive form to be more clinically useful. For example, veterans who endorsed both active and passive ideation were only counted as ‘active SI.’ For cross tabulations, survey variables with more than two levels were dichotomized to ‘no’ or ‘not at all’ versus all other categories with responses other than ‘not at all’ or ‘no’ considered positive. Veterans were classified by MDE and PTSD status without regard to their alcohol misuse status because cell sizes were too small when veterans were classified by alcohol misuse in addition to MDE and PTSD status.(Appendix Table A.1) A two-tailed overall chi-squared test of independence of proportions was considered significant for $p < 0.05$. The post hoc pair-wise comparison of proportions was

carried out with the Bonferroni correction. SPSS version 18 was used for the analysis.

2.3 Results

2.3.1 Sample characteristics

The sample were mostly men (89%), middle aged (mean age=47 years), and Caucasians (63%). Seventy-five percent attended college but only 15% were employed full time. The majority were either separated (12%), divorced (34%), or never married (23%). Ten percent considered themselves homeless. About half (47%) were veterans of the Persian Gulf War era. Thirty-three percent met study criteria for MDE. All of the participants with MDE had moderately severe to severe depression by the PHQ-9 severity scoring method. Fifty percent of respondents screened positive for PTSD and 22% screened positive for alcohol misuse. In addition, 18% of participants reported using drugs in the previous week. The mean number of psychiatric or substance use disorders was 2.4 (SD, 1.14) (Table 2.1).

2.3.2 Prevalence of SI and Behaviors

More than half (52%) of participants reported SI or behaviors in the last week (Table 2.2). The frequency of ideation/behaviors remained relatively consistent across categories of increasing severity with a similar numbers of respondents reporting passive SI only, a plan with no preparation, and a plan with preparation. About three-fourths of respondents (74%) reported a history of SI or SA and of these almost half (48%) had attempted suicide at some time in their life.

2.3.3 Prevalence of Other Warning Signs

Suicide warning signs other than SI and behaviors are reported in Table 2.3. Their prevalence varied between 90% for insomnia/hypersomnia and

Table 2.1: Characteristics of veterans attending a psychiatric emergency clinic,
n=482

		Mean	SD	n	(%)		
Age(yrs)	Sex	Male	47	13	430	(90)	
		Female	40	13	52	(10)	
Age(yrs)	20 to 29				81	(17)	
	30 to 39				69	(14)	
	40 to 49				92	(19)	
	50 to 59				156	(32)	
	60 +				84	(17)	
Race/ethnicity	White				301	(63)	¹ Veterans who were enlisted but did not serve in a combat related role in Iraq or Afghanistan.
	Black				67	(14)	
	Hispanic				50	(10)	
	Other				59	(12)	
Education	< High School				18	(4)	² Veterans who served in a combat related role in Iraq or Afghanistan.
	High School				100	(21)	
	Some college				275	(58)	
	4 yr graduate				53	(11)	
	Graduate school				28	(6)	
	Other				4	(1)	
Employment	Full time				73	(15)	³ Eras with small size collapsed into other category. ⁴ Screened positive on the Primary Care Post Traumatic Stress Disorder (PC-PTSD) tool.
	Part time				35	(7)	
	Looking for work				87	(18)	
	Retired				38	(8)	
	Disabled				177	(37)	
	Other				67	(14)	
Marital status	Married				102	(21)	⁵ Screened positive for alcohol misuse (hazardous drinking or an alcohol use disorder) on the Alcohol Use Disorders Identification Test (AUDIT-C).
	Separated				58	(12)	
	Divorced				161	(34)	
	Cohabiting				35	(7)	
	Never married				110	(23)	
	Widowed				13	(3)	
Housing	Home or apartment				331	(69)	⁶ MDE is major depressive episode and is defined using the PHQ-9.
	Group home				31	(6)	
	Temporary shelter				25	(5)	
	Homeless				48	(10)	
	Other				43	(9)	
Service Era ³	Vietnam				159	(33)	
	Post Vietnam				85	(18)	
	Persian Gulf A ¹				133	(28)	
	Persian Gulf B ²				90	(19)	
	Other				14	(3)	
PTSD ⁴	Yes				242	(50)	
Alcohol misuse ⁵	Yes				105	(22)	
MDE ⁶	Yes				158	(33)	
Drug use	Yes				87	(18)	
Psychiatric or substance use diagnoses	0				20	(4)	
	1				105	(22)	
	2				131	(27)	
	3				135	(28)	
	4 or >				91	(19)	

Table 2.2: Prevalence of suicidal ideation (SI) and behaviors in veterans attending a psychiatric emergency clinic, n=482^{1,2}

		n (%)
Thoughts and Behaviors	No SI	230 (48)
	Passive SI only	76 (16)
	Active SI, no plan	46 (10)
	Plan, no Preparation	72 (15)
	Preparation of Plan	58 (12)
History of SI/SA ³	None	126 (26)
	Passive SI only	29 (6)
	Active SI, no SA	156 (33)
	SA	169 (35)

¹ Passive SI=past 2 wk thoughts of death or harming self or past 1 wk thoughts of death. All other categories based on past 1 wk.

² Categories of variables are mutually exclusive.

³ SA=suicide attempt.

19% for hurt self or reckless behavior. Affective states of anxiety, agitation, anger, rage, feeling trapped, hopelessness, desperation, and dramatic changes in mood were all highly prevalent. Almost as many veterans reported experiencing intense anxiety, agitation, hopelessness, and desperation nearly every day as reported not experiencing them at all.

2.3.4 Prevalence of SI and Behaviors and Other Warning Signs by MDE and PTSD Status.

Exploratory analysis of the association between suicide warning signs, and MDE and PTSD, is shown in Table 2.4. There was a significant overall difference in the frequency of suicide warning signs across all four groups (none, MDE only, PTSD only, and MDE and PTSD). In post hoc pairwise comparisons, each of the three groups with any disorder had significantly more of almost every warning sign than the group with neither disorder. However, there were fewer significant differences when comparing MDE only, PTSD only,

Table 2.3: Prevalence of past one week suicide warning signs¹ among veterans attending a psychiatric emergency clinic, n=482

	Not at all	Several days	> Half the days	Nearly every day
	n (%)	n (%)	n (%)	n (%)
Insomnia or hypersomnia	50 (10)	103 (21)	98 (20)	229 (48)
Intense anxiety or anxiety attacks	113 (24)	130 (27)	109 (23)	126 (26)
Intense agitation	117 (24)	142 (29)	110 (23)	113 (23)
Intense anger	209 (44)	120 (25)	80 (17)	69 (14)
Hopelessness	143 (30)	118 (25)	93 (19)	124 (26)
Desperation	143 (30)	102 (21)	96 (20)	139 (29)
Out of control	217 (45)	112 (23)	81 (17)	70 (15)
Trapped-no way out	162 (34)	114 (24)	83 (17)	119 (25)
Abandoned by others	195 (41)	119 (25)	72 (15)	92 (19)
Intense self-hatred	257 (54)	83 (18)	70 (15)	62 (13)
Dramatic mood changes	148 (31)	120 (25)	110 (23)	100 (21)
	No	Yes		
Increased substance use	365 (79)	97 (21)		
Hurt self or reckless behavior	385 (81)	91 (19)		
Withdrawing	193 (42)	262 (58)		

¹ Insomnia / hypersomnia, reflects past 2 weeks. All other variable are past one week.

² Warning signs of suicidal ideation and direct behaviors are provided in a separate table.

and both MDE and PTSD. In addition, in comparing only the two groups with MDE to each other, the group with MDE and PTSD was significantly more frequent for the intense affective states of anxiety, agitation, and anger. The group with PTSD alone was not significantly more frequent for any of the items compared to either group with MDE. Perhaps most striking was that only 3.1% of veterans ($n = 15$) did not endorse any warning signs and the mean number of signs endorsed was 7.6. When history of SA was included with the suicide warning signs, only 2.3% ($n = 11$) did not make any endorsements (data not shown).

Table 2.4: Prevalence of suicidal ideation (SI), behaviors and other warning signs by clinical characteristics in veterans attending a psychiatric emergency clinic, n=482

	None (n=186) n (%)	MDE ^a only (n=56) n (%)	PTSD ^b only (n=140) n (%)	MDE & PTSD (n=102) n (%)	Total (n=482) n (%)
Passive SI ^{c,d,e,f,g}	38 (20)	41 (73)	55 (39)	72 (71)	206 (43)
Active SI ^{c,d,e,f,g}	28 (15)	41 (73)	43 (31)	61 (60)	173 (36)
SI with plan ^{c,e,f,g}	21 (11)	28 (50)	30 (21)	44 (43)	123 (26)
Plan preparation ^{c,e,f}	7 (4)	16 (29)	14 (10)	21 (21)	58 (12)
Insomnia or hypersomnia ^{c,d,e}	143 (77)	55 (98)	132 (94)	100 (98)	430 (89)
Intense anxiety/anxiety attacks ^{d,e,f,h}	103 (55)	40 (71)	124 (89)	98 (96)	365 (76)
Intense agitation ^{c,d,e,h}	100 (54)	43 (77)	125 (89)	97 (95)	365 (76)
Intense anger ^{d,e,g,h}	63 (34)	29 (52)	93 (66)	84 (82)	269 (56)
Hopeless ^{c,d,e,f,g}	81 (44)	53 (95)	101 (72)	100 (98)	335 (70)
Desperate ^{c,d,e,g}	80 (43)	51 (91)	107 (76)	99 (97)	337 (70)
Out of control ^{c,d,e,g}	51 (27)	42 (75)	85 (61)	85 (83)	263 (55)
Trapped ^{c,d,e,f,g}	68 (37)	50 (89)	101 (72)	97 (95)	316 (66)
Abandoned by others ^{c,d,e,g}	62 (33)	39 (70)	95 (68)	87 (85)	283 (59)
Intense self-hatred ^{c,d,e,g}	30 (16)	36 (64)	68 (49)	81 (79)	215 (45)
Dramatic mood changes ^{c,d,e}	91 (49)	39 (70)	112 (80)	88 (86)	330 (68)
Increased substance use ^{c,d,e}	19 (10)	16 (29)	34 (24)	29 (28)	98 (20)
Withdrawing from others ^{c,d,e,f,g}	46 (25)	46 (82)	84 (60)	91 (89)	267 (55)
Hurt self / reckless behavior ^{d,e}	13 (7)	10 (18)	31 (22)	37 (36)	91 (19)
History of SA ^{c,d,e}	45 (24)	24 (43)	54 (39)	46 (45)	169 (35)

Cells are the number and percent of yes responses to the row variables.

History of a suicide attempt (SA) although included in this table is not a suicide warning sign.

Passive SI, active SI, suicide plan, and plan preparation are *not* mutually exclusive.

^a MDE is major depressive episode and is defined using the PHQ-9.

^b PTSD = post traumatic stress disorder.

The overall Pearson χ^2 was significant at $p < .0005$ for all variables except history of SA which was significant at $p < .001$. Pair-wise comparisons are Bonferroni corrected ($\alpha .05/6=.008$)

^c none < MDE only

^d none < PTSD only

^e none < MDE and PTSD

^f PTSD only < MDE only

^g PTSD only < MDE and PTSD

^h MDE only < MDE and PTSD

2.4 Discussion

We found a strikingly high prevalence of current SI and behaviors as well as other warning signs in veterans attending an outpatient walk-in psychiatric emergency clinic.

2.4.1 Prevalence of SI and Behaviors

More than half of participants reported past week SI and behaviors including a substantial number of veterans who reported current suicide plans and even preparation of a plan ‘such as buying a gun or saving up pills.’ Our self-report rate of ideation and behavior is higher than that reported in studies based on psychiatrist assessment (Bauer and Balter, 1971; Breslow et al., 1996; Dhossche et al., 2000; Dobscha et al., 1999; Ernst et al., 2006; Feinstein and Plutchik, 1990; Healy et al., 2006; Knesper, 1982) but is consistent with that found by self-administered surveys in both a psychiatric emergency clinic (Healy et al., 2006) and psychiatric outpatients at a county-funded clinic (Zisook et al., 1994). The overall rate of history of suicide attempts is also consistent with that reported by Zisook and colleagues. Because a history of a suicide attempt is a powerful predictor of future suicide attempt and death by suicide, the high prevalence of prior suicide attempts suggests that clinicians should carefully assess all visitors to a PEC for past as well as current SI and behaviors including suicide attempts.

2.4.2 Prevalence of Other Suicide Warning Signs

Many of the other warning signs were also highly prevalent. This was particularly true of intense affective states where the lowest prevalence was 47% for intense self-hatred and the highest was 76% for both intense anxiety or anxiety attacks and intense agitation. Screening psychiatric emergency clinic visitors for intense affective states and other suicide warning signs would allow immediate intervention targeted at modifiable warning signs such as anxiety and insomnia as suggested by Fawcett (Fawcett, 2007).

However, based on the high prevalence of suicide warning signs in this population, no one or two of them would appear useful for clinical decision making regarding suicide risk. A one-year follow-up study of this cohort is underway to determine which suicide warning signs, singly or in clusters, are most associated with a suicide attempt or hospitalization for severe suicidal ideation.

2.4.3 SI, Behaviors, and Other Warning Signs, and MDE and PTSD

We found that participants with MDE and PTSD not only endorsed all of the suicide warning signs more frequently than participants with neither disorder but that they endorsed the intense affective states of anxiety, agitation, and anger more frequently than veterans with MDE alone. MDE concomitant with PTSD increases the risk of suicidal behavior (Hendin and Haas, 1991; Kramer et al., 1994). Moreover, Hendin and colleagues found that the presence of intense affective states was one of the three factors that usually occurred before a death by suicide (Hendin et al., 2010b).

Aside from the issue of the utility of suicide warning signs in acute risk estimation (hours to days), the results of our study suggest that many veterans with MDE and PTSD are bearing a uniquely potent burden of distress which needs to be recognized and treated.

2.4.4 Limitations

A number of limitations are important to keep in mind. The data are drawn entirely from self-report which may not always tell the full story of suicide risk. Participants may have under or over reported their experiences for a number of reasons. Although veterans were advised that the survey was confidential and would not be shown to clinicians they were also told that if they made any verbal or written indications that they might harm themselves that the researcher was required to inform the clinical staff. As a result, respondents

who were concerned that they might be involuntarily hospitalized may have under reported suicide warning signs. Alternately, veterans who wanted to be hospitalized may have over reported suicide warning signs. In this regard, an important next step is to compare participant self-report and psychiatrist rating based on a face-to-face interview in this population to determine their concordance. This study is underway. However, even with under or over reporting, self-report through a self-administered survey provides valuable information on the direct experience of the participant which might not be obtained in a face-to-face interview alone.

Another potential limitation is selection bias through the exclusion of veterans who were too ill to participate ($n = 11$) or were excluded because they had been flagged by the VA as potentially violent ($n = 2$). However the small number of veterans in these categories makes it unlikely that any effect is significant.

It is also important to keep in mind that the data are cross-sectional so a causal relationship between the clinical characteristics of MDE and PTSD, and suicide warning signs cannot be inferred. In addition, a seasonal effect cannot be excluded since data were collected over only a five month period. Limitations particular to the analysis of suicide warning signs and MDE and PTSD include the relatively small numbers in several categories. In addition, the PHQ-9 criteria were used as a proxy for MDE. We can't be sure that this categorization coincides exactly with patients an experienced clinician would diagnose with MDE, especially given the absence of an impairment measure. However 85% of participants we considered to have MDE based on the PHQ-9, had severe depression using PHQ-9 severity scoring. Finally, further research is needed in other populations before it is known whether the results of this study generalize to non-veteran populations.

2.4.5 Conclusion

The importance of this data is underscored by the known risk for completed suicide among active duty military and young veterans (Kaplan et al.,

2007; McFarland et al., 2010) and the alarmingly high rate of past and present suicidal thoughts and behaviors noted in veteran participants in this study-more than one-third of them experienced active SI in the past week. The next steps are to examine concordance between the veterans' report of SI and behaviors and the psychiatrists' clinical notes and to follow the sample for suicidal behaviors. The high prevalence of suicide warning signs including SI and behaviors in this population suggests that their use in guiding clinical decisions may rest on finding clusters of warning signs that indicate acute risk (hours to days) or understanding how warning signs vary within an individual depending on whether they are in a suicidal crisis or not. Thus it will be important to follow this cohort over time and look at risk factors that may predict actual attempts and deaths by suicide. A follow-up study is underway and will be reported in a subsequent report.

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The dissertation author was the primary researcher and author.

Chapter 3

Agreement Between Self-Report and Psychiatrist Assessment of Suicidal Thoughts and Behaviors

3.1 Introduction

Suicide is the 11th leading cause of death in the United States with over 34,000 Americans dying from suicide each year (Center for Disease Control and Prevention, 2008). Up to 90% of people who die from suicide have a psychiatric or substance use disorder (Moscicki, 2001). The contribution of certain psychiatric disorders (such as recurrent major depression), severe psychosocial stress (such as loss, shame or humiliation) and vulnerabilities (such as genetic predisposition and early childhood abuse) can be lethal thus an important aspect of suicide prevention in mental health care settings is an effective suicide risk assessment that identifies these and other risk and protective factors, and guides treatment decisions.

We have previously found high rates of self-reported suicidal ideation (thoughts), behaviors, and other suicide warning signs (acute risk factors) in veterans attending a Veterans Administration (VA) walk-in service (Chapter 2). More than half (52%) of participants reported past week suicidal ideation (SI) and behaviors including a substantial number of veterans who reported current suicide plans and even plan preparation ‘such as buying a gun or saving up pills.’

It is important to know the degree to which such self-reported risk factors

are identified and documented by clinicians. A VA study of suicide attempts identified inadequate assessment and communication of risk as a root cause, (Mills et al., 2006) and Malone and colleagues found that in 12 of 50 high risk patients a history of suicide attempts (SA) was not documented on admission to an acute psychiatric facility and that the discharge summaries had even lower rates of documenting a history SA (Malone et al., 1995). This is particularly concerning because a history of SA is one of the strongest risk factors for a future SA or death by suicide. There are many possible reasons for an inadequate assessment including insufficient training, time pressures, fear of increased liability by asking about and/or documenting risk, delegation of the task to others, and lack of a systematic approach (Jobes and Berman, 1993; Kaplan et al., 1994; Shea, 2002; Simon, 2006).

Although guidelines have been published such as those by the American Psychiatric Association (American Psychiatric Association, 2003) there is no standard for the content of a suicide risk assessment (Bongar et al., 1992). When completed by a psychiatrist or other mental health clinicians, the format of a suicide assessment is usually an unstructured interview (Bongiovi-Garcia et al., 2009; Jobes et al., 1995; Miller et al., 2001; Simon, 2006) which has no specific content areas but rather is guided by clinical experience, the clinicians own style, and the unfolding of the interview.

A semi-structured interview format has predetermined content areas but allows the clinician to decide how and in what order to explore the predetermined areas.

A fully structured interview format has pre-determined questions which are asked in a specified order. The fully structured interview can be administered by a trained researcher as well as a clinician or self-administered in the form of a survey or questionnaires.

Suicide risk assessments are “rarely performed systematically” (Simon, 2006) and in the absence of a systematic approach important risk and protective factors can be overlooked. Use of an unstructured format alone may make it more difficult to be systematic. Almost half (41%) of inpatients hospitalized

for a suicide attempt who had been seen by a mental health professional within three months of their attempt ($n = 29$) reported that were not asked at the time of their appointment about SI (Coombs et al., 1992);

The few available studies of suicide risk assessment formats suggest that structured or semi-structured formats identify SI at a higher rate than unstructured assessments. Thirty percent of inpatients identified as having current SI by a structured assessment were not identified during an unstructured assessment by the psychiatric resident (Bongiovi-Garcia et al., 2009). In a psychiatric emergency clinic 62% of visitors reported SI on a self-administered survey while clinicians using an unstructured format rated only 37% as suicidal (Healy et al., 2006).

Structured assessments have also shown higher rates of detection for long term suicide risk factors such as psychiatric and substance use disorders, (Magruder et al., 2005; Ramirez Basco et al., 2000; Szuster et al., 1990; Woodward et al., 1991)) and a history of suicide attempts (Bongiovi-Garcia et al., 2009; Malone et al., 1995) compared to unstructured assessments. Moreover, when the same structured assessment tool was self-administered by the patient and then used by the clinician in their interview to assess past and current SI and behaviors, agreement was good for all questions (Kaplan et al., 1994). In a study comparing a self-report survey and clinician completed measures of ‘suicidality,’ patients rated themselves as less ‘suicidal’ than the clinician. Follow-up assessments showed that the patient’s self-rating was more predictive of future ‘suicidality than the clinicians (Joiner et al., 1999).

In this paper we will assess the agreement of self-reported SI and behaviors with the psychiatrists unstructured interview notes in the clinical setting of a psychiatric emergency clinic. We hypothesize that veterans will self-report SI and behaviors significantly more often than psychiatrists will record them in their clinical notes.

3.2 Methods

3.2.1 Setting

The Psychiatric Emergency Clinic (PEC) at the San Diego Veterans Administration (SD VA) Medical Center is open weekdays from 8am to 5pm. The clinical staff for the PEC includes a psychiatric nurse (PEC Coordinator), a second year psychiatric resident supervised by a staff psychiatrist, and a pharmacist specializing in psychiatric pharmacology. The staff psychiatrist evaluates veterans when asked to do so by the resident, when the resident is unavailable, or the clinic is very busy. The PEC coordinator determines formally (with documentation) or informally whether the veterans' needs are best met through a complete PEC evaluation or through other VA services. Other services include a same day appointment with their regular psychiatrist, an alcohol and drug treatment intake, a prescription refill provided by the psychiatric pharmacist, or a full mental health intake by a psychologist or social worker and a psychiatrist through the Same Day Access Clinic.

3.2.2 Sample

Participants were all veterans who checked into the PEC between January and the end of April 2010 regardless of services received. Exclusion criteria were previous enrollment in the study; a medical record flag for violent behavior; acute intoxication; a diagnosis of dementia or the presence of acute psychosis, or confusion; visible intense distress; and impaired decision-making capacity by formal or informal evaluation. Out of 911 total visits to the PEC during the five month study period, 154(17%) were repeat visits leaving 757 unique veteran visits. Of these 757 veterans, 38 could not be accessed by the researcher and 107 did not qualify leaving 612 veterans who met study criteria. Of the remaining 612 veterans 106 (17%) refused to participate leaving a participation rate of 83%. In addition 18 gave consent but were unable to complete the survey, surveys from 4 veterans were unusable, and 8 veterans were excluded based on the psychiatrist's documentation of SI; 'suicidal' only in the context of obtain-

ing hospitalization (that is, the psychiatrist's opinion was that the veterans was not truly suicidal). Of the remaining veterans 476 veterans, 79% (377) were seen by a psychiatrist on the same day, and were thus included in this analysis. Compared to all veterans seen in the PEC in June of 2010, participants were significantly younger (46.2 *vs.* 49.3 years of age, $p = .01$) but did not differ by gender or service war era.

3.2.3 Protocol

The study was approved by the University of California, San Diego institutional review board (IRB) and the San Diego VA research committee. In accordance with California state law and IRB requirements, veterans were informed during the consent process that although the survey would not be shown to clinicians, endorsement of any current SI or behavior on the survey or verbally to the researcher would be reported to a member of the clinical staff. Following written consent veterans were asked to complete the self-administered survey. This was generally done before the veteran was seen by the clinical staff but if time did not allow, the veteran completed the survey between or after being seen by the clinical staff.

3.2.4 Self-Report Measures

The self-administered survey had four components. Current and past SI and behaviors, the first component, was assessed using a modified version of the Depression and Suicide Screening Project Survey developed by suicide experts at the American Foundation for Suicide Prevention (Garlow et al., 2008). Using a four point scale (not at all, once, two–three times, and more than three times), participants were asked whether during the past week they ‘wished to be dead’ (passive ideation), ‘thought about taking your own life’ (active ideation), ‘hurt yourself or put your life in imminent danger’, ‘planned ways of taking your own life’, or ‘made preparations, for example saving up pills or getting a gun’. Results from the ‘hurt self’ question were not included in this analysis because it was

unclear whether veterans interpreted this question as asking about behaviors not related to suicide such as cutting and because a number of veterans reported that they considered living on the streets (that is, being homeless) to be risking their lives everyday.

For the purpose of analysis and discussion, the four categories of SI and behaviors are considered to be in order of increasing severity. However we recognize that for any given individual the clinical reality is far more complex.

The second component assessed current MDE using the nine question Patient Health Questionnaire 9 (PHQ-9). The PHQ-9 has been validated in two large multi-site studies (Spitzer et al., 1999; Spitzer et al., 2000). The PHQ-9 asks about symptoms during the past two weeks based on the DSM-IV (American Psychiatric Association, 1994) criteria for a major depression. We increased the threshold for frequency of symptoms from ‘more than half the days’ to ‘nearly every day’ so that only the participants most likely to have a clinically meaningful MDE were included. MDE was considered present if the respondent endorsed ‘feeling down or depressed or hopeless’ or ‘feeling a lack of interest or pleasure in doing things’ nearly every day and endorsed five or more questions as ‘nearly every day’ in the past two weeks. The question regarding SI is considered positive if several days or more frequent is endorsed (Kroenke et al., 2001). Depression severity was measured using the total score with 0–4 considered no depression, 5–9 mild, 10–14 moderate, 15–19 moderately severe, and 20–27 severe depression (Kroenke et al., 2001).

The third component was an assessment for alcohol misuse (hazardous drinking or an alcohol use disorder). We asked participants to complete the three-question Alcohol Use Disorders Identification Test (AUDIT-C). The AUDIT-C is a screening instrument that has been validated in VA veterans (Bush et al., 1998) and the general population (Dawson et al., 2005). Alcohol misuse was considered present if the total score was ≥ 5 for men and ≥ 4 for women (Dawson et al., 2005).

The fourth component was a screening for Post Traumatic Stress Disorder (PTSD). We asked participants to complete the four-question Primary Care

Post Traumatic Stress Disorder scale (PC-PTSD) (Prins et al., 2003). The PC-PTSD is a screening instrument that has been validated in primary care (Prins et al., 2003) and other populations such as soldiers returning from combat (Bliese et al., 2008), and VA veterans in treatment for a substance use disorder (Kimerling et al., 2006). The screen was positive if the total score was equal to 3 (Prins et al., 2003).

Veteran rating

Suicidal ideation and behaviors variables were based on the survey items that asked about passive SI, active SI, having a plan, and preparation of a plan during the past one week and the single PHQ-9 item about past two week passive and active SI “thoughts ‘that you would be better off dead’ or thoughts of physically harming yourself.” Veterans who endorsed the PHQ-9 item about passive and active SI during the past *two* weeks but did not endorse any active SI during the past *one* week were considered to have as passive SI only. The variables for active SI, a suicide plan, and preparation of plan were all based only on the past one week questions. Variables for SI, behaviors, and history of SA were mutually exclusive to provide more clinically meaningful results. For example, veterans who endorsed both active and passive ideation were only counted as ‘active SI’.

Other measures

The variables for psychiatrist rating of SI and behaviors was based on the psychiatrists’ documentation of the interview on the day of the self-administered survey. The author (J. McC.) was blind to the survey results while coding the psychiatrists’ clinical notes. Any mention of SI or behaviors was extracted and coded using the same four mutually exclusive categories used for the veteran rating variables (passive SI, active SI, suicide plan, and preparation of a suicide plan). Where notes were unclear or had contradictory statements (for example “wishes he were dead” under presenting complaint and “no SI” under mental status exam) co-author and fourth year psychiatric resident (J. K.) reviewed the

record and coded it. When not in agreement, the records were reviewed together by J. McC and J. K. and if agreement was still not reached the record was not included in the study ($n = 2$). In addition, J. K. reviewed 35 randomly selected records and independently coded them. Neither J. McC nor J. K. were aware of the patient's self responses when coding the psychiatrists notes. Concordance with J. McC was 80% in this subsample. Veteran diagnoses of personality disorder and substance use disorder were extracted from the medical record including any notes entered by the psychiatrist the day of the survey.

History of suicide attempt

Psychiatrist documentation of history of SA was extracted from documentation of the psychiatrists' interview with the veteran on the day of the self-report survey. Where no documentation was found the case was coded as "no history of SA."

3.2.5 Statistical analysis

Frequencies and cross tabulations were used to determine the prevalence of suicide warning signs. Agreement between the veteran and the psychiatrist ratings of SI and behaviors was first examined by looking for patterns in the cross tabulation table. Then the proportion correct (sum of diagonal cell frequencies divided by total n) was calculated to estimate agreement without consideration of chance agreement. To account for chance agreement a kappa was calculated and to assess for partial agreement (*e.g.* psychiatrist rating of passive ideation with veteran report of active ideation) a quadratic weighted kappa was used. Bowker's Test of Symmetry, an extension of the McNemar test, (Krampe and Kuhnt, 2007) was used to assess systematic bias of the raters; the tendency of one rater to make ratings generally higher or lower than the other rater. SAS V9.1 was used for calculating the measures of agreement. SPSS version 18 was used for all other analysis.

3.3 Results

3.3.1 Sample characteristics

The sample ($n = 377$) were mostly men (89%), middle aged (mean age 46 years), and Caucasians (62%). Seventy-five percent attended college but only 16% were employed full time. The majority were either separated (11%), divorced (36%), or never married (22%). Nine percent considered themselves homeless. About half (47%) were veterans of the Persian Gulf. PHQ-9 defined major depressive episode (MDE) was present in 34 % of participants. All of the participants with MDE had moderately severe to severe depression on the PHQ-9 depression severity scale. Fifty-four percent of respondents met the screening criteria for PTSD and 24% met screening criteria for alcohol misuse (hazardous drinking or an alcohol use disorder). In addition, 20% of participants reported using drugs in the previous week. The mean number of psychiatric and substance use disorders was 2.5 (SD 1.0) (Table 3.1).

3.3.2 Agreement between veteran and psychiatrist ratings

Table 3.2 shows a cross tabulation of veteran and psychiatrist ratings of current SI and behaviors for the total sample. (Data for veterans who were considered by the psychiatrist to be reporting SI only for the purpose of being hospitalized, were excluded from all analysis.) For 164 of the veterans (46%), psychiatrists differed from the veteran in their ratings of current SI and behaviors. Psychiatrist ratings were systematically less severe than the veteran ratings, with 297 psychiatrist ratings but only 178 veteran ratings of no SI. Among the discordant cases, the veteran rating was more severe than the psychiatrist rating 97% ($n=159$) of the time. The greatest frequency of disagreement occurred when the psychiatrist rated the veteran as having no SI. The same pattern was found when the data were stratified by type of psychiatrist (2nd year resident *vs.* staff psychiatrist), presence of MDE, psychiatrist-documented history of SA,

Table 3.1: Characteristics of veterans attending a psychiatric emergency clinic,
n=377

		Mean	SD	n	(%)	
Age(y)	Sex					
	Male	47	13	336	(89)	
	Female	40	14	41	(11)	
Age(y)	20 to 29			69	(18)	¹ Veterans who were enlisted but did not serve in a combat related role in the Iraq or Afghanistan.
	30 to 39			54	(14)	
	40 to 49			67	(18)	
	50 to 59			121	(32)	
	60 +			66	(18)	
Race/ethnicity	White			231	(62)	² Veterans who served in a combat related role in the Iraq or Afghanistan.
	Black			53	(14)	
	Hispanic			40	(11)	
	Other			48	(13)	
Education	< High School			12	(3)	³ Era's with small size collapsed into other category.
	High School			77	(21)	
	Some college			216	(58)	
	4 yr graduate			40	(11)	
	Graduate			24	(6)	
Employment	Other			4	(1)	⁴ Screened positive on the Primary Care Post traumatic stress disorder (PC-PTSD) tool.
	Full time			61	(16)	
	Part time			28	(7)	
	Looking for			64	(17)	
	Retired			30	(8)	
Marital status	Disabled			137	(37)	⁵ Screened positive for alcohol misuse (hazardous drinking or an alcohol use disorder) on the Alcohol Use Disorders Identification Test (AUDIT-C).
	Other			54	(14)	
	Married			76	(20)	
	Separated			41	(11)	
	Divorced			135	(36)	
Housing	Cohabiting			29	(8)	⁶ MDE=PHQ-9 DSM Major Depression
	Never married			83	(22)	
	Widowed			10	(3)	
	Home or			257	(69)	
	Group home			28	(7)	
Service Era	Temporary			19	(5)	
	Homeless			35	(9)	
	Other			35	(9)	
	Vietnam			128	(34)	
	Post Vietnam			63	(17)	
PTSD (screen)	Persian Gulf A			97	(26)	
	Persian Gulf B			79	(21)	
	Other			9	(2)	
	yes			202	(54)	
	Alcohol misuse			89	(24)	
MDE ⁶			128	(34)		
Substance use			75	(20)		
Psychiatric or substance use diagnoses	0			2	(1)	
	1			82	(22)	
	2			109	(29)	
	3			111	(29)	
	4 or >			73	(19)	

Table 3.2: Agreement between veteran and psychiatrist rating of suicidal ideation (SI) and behaviors. n=377

		Veteran Rating					Total n
		No SI n (%)	Passive SI only n (%)	Active SI, no plan n (%)	Plan, no preparation n (%)	Preparation of plan n (%)	
MD Rating	No SI	177 (60)	50 (17)	21 (7)	31 (10)	18 (6)	297
	Passive SI only	1 (5)	6 (29)	3 (14)	9 (43)	2 (10)	21
	Active SI, no plan	0 (0)	1 (4)	9 (35)	11 (42)	5 (19)	26
	Plan but no preparation	0 (0)	0 (0)	0 (0)	9 (50)	9 (50)	18
	Preparation of plan	0 (0)	0 (0)	1 (7)	2 (13)	12 (80)	15
Total n		178	57	34	62	46	377

Proportion correct 56% (213/377), kappa 0.28, weighted kappa 0.47

Pair-wise comparisons (Bonferroni corrected $\alpha=0.013$) of categories significant at $p < 0.0001$ for all but active SI vs. active SI (p 0.217)

and when stratified by both MDE and psychiatrist-documented history of SA. Results are presented for when the psychiatrist rated the veteran as having no SI in Table 3.3. The proportion of discordant ratings was highest when MDE was present. A surprisingly high proportion of the discordant ratings occurred with veterans who had a current suicide plan and even had made plan preparations in the past week. Table 3.7 summarizes the measures of agreement reported in Table 3.3. The proportion correct is again lowest in groups where the veteran has MDE. When chance agreement was removed with the calculation of kappa, agreement was generally low but the lowest kappas were found where MDE was present ($\kappa = 0.19$) whether there was a positive history of SA ($\kappa = 0.15$) or no history of SA ($\kappa = 0.17$) and when there was both no history of SA and no MDE ($\kappa = 0.15$). Agreement was improved when the psychiatrist documented a history of SA. Agreement was highest when the psychiatrist documented a history of SA ($\kappa = 0.35$) and when the psychiatrist was a resident ($\kappa = 0.27$). When a weighted kappa was calculated, agreement overall improved modestly

Table 3.3: Veteran ratings of suicidal ideation (SI) and behaviors by ratings of no SI by the psychiatrist by selected characteristics^a

MD Rating of No SI	Veteran Self-Report Rating					
	Concordant	Discordant between MD and vet self-report				
	No SI n (%)	Passive SI only n (%)	Active SI, no plan n (%)	Plan, no preparation n (%)	Preparation n (%)	Total n(100%)
Total sample	177 (60)	50 (17)	21 (7)	31 (10)	18 (6)	297
MDE ^b not present	116 (82)	11 (8)	3 (2)	8 (6)	3 (2)	141
MDE present	61 (39)	39 (25)	18 (12)	23 (15)	15 (10)	156
Second year psychiatry resident	90 (57)	31 (19)	13 (8)	18 (11)	7 (4)	159
Staff psychiatrist	87 (64)	18 (13)	8 (6)	13 (9)	11 (8)	137
No history of SA ^{c,d}	150 (61)	42 (17)	19 (8)	22 (9)	14 (6)	247
History of SA	27 (54)	8 (16)	2 (4)	9 (18)	4 (8)	50
No history of SA & no MDE	130 (71)	25 (14)	7 (4)	12 (7)	8 (4)	182
History of SA & no MDE	25 (64)	5 (13)	1 (3)	6 (15)	2 (5)	39
No history SA & MDE present	19 (30)	17 (27)	12 (19)	10 (16)	6 (9)	64
History of SA & MDE present	2 (18)	3 (27)	1 (9)	3 (27)	2 (18)	11

^a Table rows represent *first rows only* of veteran by psychiatrist 5x5 tables for stratified by elected characteristics.

^b MDE = Major depressive episode and is based on the nine symptoms questions on the PHQ-9.

^c SA = suicide attempt

^d History of SA documented by the psychiatrist

and the effect of MDE was no longer evident. Progressively excluding veterans who might over report symptoms solely to obtain hospitalization did not materially change the results (Table 3.4, 3.5 and 3.6).

The generalized McNemar test of symmetry (Bowker's test) was statistically significant for all strata except when there was a history of SA and no MDE ($p = 0.074$) indicating the *disagreement* was not spread evenly across the categories as would be expected if the disagreement was random. In other words, the psychiatrist and the veteran selected categories in differing proportions. This is consistent with the pattern seen in the full table for the total sample (Table 3.2) and all of the stratified tables (data not shown); psychiatrists consistently rated the veterans' SI and behaviors as less severe than the veteran's self rating.

Table 3.4: Agreement between veteran and psychiatrist rating of suicidal ideation (SI) and behaviors excluding homeless. n=339

		Veteran Rating					Total n
		No SI n (%)	Passive SI only n (%)	Active SI, no plan n (%)	Plan, no preparation n (%)	Preparation of plan n (%)	
MD Rating	No SI	162 (60)	43 (20)	20 (10)	28 (10)	15 (10)	268
	Passive SI only	1 (6)	5(30)	3 (20)	7 (40)	2 (10)	18
	Active SI, no plan	0 (0)	1 (0)	8 (30)	11 (40)	5 (20)	25
	Plan but no preparation	0 (0)	0 (0)	0 (0)	9 (50)	9 (50)	18
	Preparation of plan	0 (0)	0 (0)	1 (10)	2 (20)	7 (70)	10
Total n		163	49	32	57	38	339

Proportion correct 56% (191/339)

Table 3.5: Agreement between veteran and psychiatrist rating of suicidal ideation (SI) and behaviors excluding homeless and diagnosis of a personality disorder. n=290

		Veteran Rating					Total n
		No SI n (%)	Passive SI only n (%)	Active SI, no plan n (%)	Plan, no preparation n (%)	Preparation of plan n (%)	
MD Rating	No SI	145 (62)	37(16)	19(8)	21(9)	11(5)	233
	Passive SI only	1(6)	4(25)	2(13)	7(44)	2(13)	16
	Active SI, no plan	0(0)	0(0)	6(27)	11(50)	5(23)	22
	Plan but no preparation	0(0)	0(0)	0(0)	7(54)	6(46)	13
	Preparation of plan	0(0)	0(0)	1(17)	2(33)	3(50)	6
Total n		146	41	28	48	27	290

Proportion correct 57%, kappa 0.25, Bowkers p < .0001

Table 3.6: Agreement between veteran and psychiatrist rating of suicidal ideation (SI) and behaviors excluding homeless and diagnosis of personality disorder or substance use disorder n=221.

		Veteran Rating					Total n
		No SI n (%)	Passive SI only n (%)	Active SI, no plan n (%)	Plan, no preparation n (%)	Preparation of plan n (%)	
MD Rating	No SI	109(62)	28(16)	14(8)	18(10)	8(5)	177
	Passive SI only	1(8)	2(17)	2(17)	6(50)	1(8)	12
	Active SI, no plan	0(0)	0(0)	5(26)	9(47)	5(26)	19
	Plan but no preparation	0(0)	0(0)	0(0)	6(55)	5(45)	11
	Preparation of plan	0(0)	0(0)	1(50)	0(0)	1(50)	2
Total n		110	30	22	39	20	221

Proportion correct 56%, kappa 0.23, Bowkers $p < .0001$

Most striking is that for the vast majority of the cases of disagreement the psychiatrist rated the veteran as having no SI or behaviors when in fact the veteran endorsed SI and/or behaviors on the survey. For example, of the veterans who were rated by the MD as having no SI or suicidal behaviors ($n = 297$), 31 (10%) self-reported a current suicide plan and 18 (6%) self-reported having made plan preparations (such as buying a gun or saving up pills) during the prior week (Table 3.2). Eleven veterans with MDE and a history of SA documented by the psychiatrist that day were rated by the psychiatrist as having no SI or behaviors. Of these, 3 (27%) reported passive SI, 1 (9%) active SI, 3(27%) a suicide plan, and 2(18%) preparation of a suicide plan within the prior week.

Table 3.7: Measures of agreement on suicidal ideation and behaviors between veteran and psychiatrist by selected characteristics.

	n	% correct^a	kappa^b	kappa 95% CI	weighted kappa	weighted 95% CI	kappa	Test of symmetry	p-value	
Total sample	377	56	0.28	0.22	0.34	0.47	0.39	0.56	147.2	< .0001
MDE ^c not present	249	68	0.27	0.18	0.36	0.40	0.26	0.54	70.5	< .0001
MDE present	128	34	0.19	0.10	0.27	0.42	0.31	0.53	81.4	< .0001
Second year psychiatry resident	213	53	0.28	0.20	0.36	0.51	0.40	0.62	89.8	< .0001
Staff psychiatrist	163	61	0.27	0.17	0.36	0.41	0.27	0.55	61.3	< .0001
No history of SA ^d	292	58	0.22	0.16	0.29	0.34	0.24	0.45	112.6	< .0001
History of SA	84	52	0.35	0.23	0.47	0.60	0.46	0.74	37.0	< .0001
No history of SA & no MDE	198	69	0.18	0.09	0.28	0.25	0.11	0.39	55.5	0.000
History of SA & no MDE	51	67	0.44	0.25	0.62	0.57	0.34	0.79	17.0	0.074
No history SA & MDE present	94	34	0.17	0.08	0.26	0.31	0.18	0.45	59.0	0.000
History of SA & MDE present	33	30	0.15	-0.01	0.30	0.47	0.24	0.69	23.0	0.011

^a Percent correct is total agreement uncorrected for chance (the sum of the diagonal cells divided by the total n).

^b Kappa counts only complete agreement (numbers on the diagonal of the 5x5 table). Weighted kappa includes partial agreement (values off the diagonal) but gives it less weight than complete agreement.

^c MDE is major depressive episode based on the nine symptom questions in the PHQ-9.

^d Psychiatrist documented "no history of SA" category includes cases where no documentation was found as well as those where the psychiatrist specifically documented that the veteran had not made a previous suicide attempt.

3.4 Discussion

We found that agreement between the veterans' self-report and psychiatrist documentation of SI and behaviors was generally low. Agreement increased when partial agreement was taken into account (*e.g.* veteran report of "passive SI" and psychiatrist documentation of "no SI"). These results are especially concerning given that the PEC clinical staff or other appropriate clinician if the veteran was seen by a different VA service, were advised when a veteran endorsed any level of SI or behaviors on the survey. However, for veterans seen in the PEC, in many cases it was the PEC coordinator who was advised by the researcher that the veteran had endorsed some level of SI or behaviors. This information may not have been given to the psychiatrist if the coordinator in their assessment did not find any SI or behaviors.¹

Even for veterans with MDE agreement remained low. This is difficult to explain especially given our stringent criteria for MDE and the fact that MDE is a strong risk factor for SA and death by suicide. Although MDE in this study is not equivalent to a clinical diagnosis of major depressive episode, 18% of the veterans with MDE scored as having moderately severe depression and 82% severe depression by the PHQ-9 severity scoring. We expected that for veterans with MDE many would also be identified by the psychiatrist as having a major depressive episode. Because a major depressive episode is a strong risk factor for SA and death by suicide, we expected that agreement would be higher because the psychiatrist would spend more time assessing veterans with current depression for evidence of current risk such as SI and behaviors.

There are many possible reasons for the overall lack of agreement between the veteran and psychiatrist ratings. The veteran data are self ratings

¹The researcher was aware that when the coordinator did not find any SI or behaviors in their assessment, the psychiatrist was not necessarily advised by the coordinator of SI or behaviors on the survey. Because there are multiple pathways that a veteran could 'travel' after consenting to the study and before completing the survey (see PEC flow chart Figure A.1 and methods Section 3.2) and because of limited human resources for the study, it was not possible to track the flow of the information (*i.e.* that the veteran endorsed SI or behaviors on the survey) to ensure that the psychiatrist was notified as well as the PEC Coordinator. For future studies it would be optimal to find a way to control this in the study design.

and participants may have under or over reported their experiences for a number of reasons. Over reporting of SI and behaviors could have occurred if veterans wanted immediate attention in the PEC or wanted to be hospitalized (or both). It is well known among veterans in the VA mental health care system that reporting SI or behaviors will result in prompt attention in the PEC thus eliminating any waiting time and potentially provide hospitalization. However, we think this is unlikely to explain our results for several reasons. First, veterans who want immediate clinical attention report to the clerk at the time they check in that they are "suicidal." They then are assessed immediately by a clinician. This occurred before the researcher could enroll them in the study thus removing any incentive to over report on the survey solely for immediate attention. Second, the six veterans who were documented by the psychiatrist as making suicide threats only to obtain some end such as hospitalization were not included in the analysis. Third, results were virtually unchanged when the analysis was done progressively excluding other veterans who might over report to obtain hospitalization for the provided food and shelter, refuge from pressing legal issues, or other reasons. Finally, veterans were aware that endorsement of SI and behaviors on the survey would only be reported verbally and to the "clinical staff" not necessarily directly to the psychiatrist thereby decreasing the likelihood that a veteran would over report solely in hopes of influencing the psychiatrist to hospitalize them.

Under reporting could have occurred with veterans who were concerned that they might be involuntarily hospitalized if they reported their SI and behaviors. In these cases, if the psychiatrist then uncovered the veterans SI or behaviors during the psychiatric interview there would be discordance. However, we do not think this explains the study results since only 5 of the 169 (3%) discordant ratings occurred where the psychiatrist rated the veteran's SI or behaviors as more severe than the veteran's self rating.

Disagreement between the veteran and psychiatrist rating may also be due to intentional withholding of information by the veteran during the interview. However, once the clinical staff was informed that the veteran revealed

that they had a plan on the survey, as was so often the case in this study, it behooves the clinician receiving the information to follow up with a systematic inquiry and resolve inconsistencies between the self-report and the information given during the interview. We did not find evidence of this process in the documentation by the PEC Coordinator or the psychiatrist. However, it could be that the clinicians did in fact make further inquiry and attempt to resolve inconsistencies but that they did not include it in their documentation since they did not actually see the survey, and the survey was part of a research study rather than part of the VA medical record.

Another source of disagreement in studies such as this is differing definitions of the trait being rated, in the present study the trait being SI or suicidal behaviors. For instance, the veteran may consider even a fleeting thought of wanting to kill them self as meeting the ‘definition’ of ‘having thoughts of killing myself’ and thus endorse that item on the survey while the psychiatrist may not feel this meets the threshold of SI and thus may not document SI. The definition of SI may even differ with some psychiatrists may not considering thoughts such as ‘I hope I don’t wake up tomorrow’ as constituting SI in the psychiatric emergency clinic setting.

In addition, differing definitions of where the boundaries are between categories of SI and behaviors can also results in disagreement. The veteran may endorse the item ‘planned ways of taking your own life’ if they have thought about driving off a bridge even though they don’t have access to a car while the psychiatrist may not consider this a ‘serious’ plan.

Finally, there may be differing definitions of the relevant time frame for SI and behaviors. The survey asked about SI and behaviors in a specific time frame but it is not known what the psychiatrist considered a clinically relevant time frame for their documentation or how they defined “current” when using that word in their documentation. In addition, the veteran interpretation of the relevant time frame for the psychiatrist’s questions it is not known. For example, a veteran who reported on the survey thoughts of ‘wanting to kill myself’ 2–3 times in the previous week may not have experienced any active SI in the

past several days and thus when asked by the psychiatrist “are you having any thoughts about wanting to kill yourself?”, may have honestly answered “no”. Alternately the veteran may have told the psychiatrist they had active SI earlier in the week but none in the past few days and the psychiatrist consider that as ‘not having current SI’ and thus not include it in their documentation. However, the presence of SI even in the past week or two is clinically relevant (Shea, 2002).

There are additional factors that are salient to understanding the study results. First, the veteran agreed to participate in the study and was completing a research instrument with prescribed choices (*e.g.* not at all, once, 2–3 times, and > 3 times) while the psychiatrist was unaware of the nature of the study taking place and was completing a clinical (non-research) narrative report as a routine part of their function in the clinic. Unless the clinical note was unambiguous, the extracted data were subject to the interpretation of the researcher. However, we found 80% agreement between reviewers (co-investigator Josh Kayman M.D. and J. McC.) when both were blinded to the survey and the other reviewer’s results. Also, the veteran is completing a survey form with no pre-filled answers whereas many of the psychiatrists use a template which includes a section called “SI/SA” which is pre-filled with ‘no SI’. Thus if the psychiatrist not change the template, their clinical note is coded as if they made the assessment and found no SI. In contrast, if the veteran does not make complete a survey answer the item is left blank and is coded as missing.

In addition, the usual protocol for veterans seen in the PEC is that the coordinator (a psychiatric nurse) makes an initial evaluation of the veteran (including a semi-structured suicide risk assessment) and verbally reports their findings to the psychiatrist before the psychiatrist’s interview. If the coordinator reported that the veteran had no SI or passive SI only this may have influenced both the extent and the results of the suicide risk assessment made by the psychiatrist.

It could also be that the veteran reported more severe SI initially on the survey which was then conveyed by the researcher to the clinical staff, but that careful assessment by the coordinator revealed less severe SI, and that the

psychiatrist after assessing the veteran considered the SI to not be significant enough to document. However, this seems unlikely because not all of the veterans were assessed by the coordinator and the survey was at times administered after the coordinator's evaluation and even after the psychiatrist's evaluation. This also seems unlikely given the number of veterans who endorsed a plan and even preparation of a plan on the survey and who were documented as having 'no SI' by the psychiatrist.

Finally, the psychiatrists may tend to write their clinical note in a way that supports their treatment plan and is less likely to expose them to criticism later.

3.4.1 Limitations

A number of limitations are important to keep in mind when making inferences from this study. Veterans who were too ill to participate ($n = 11$) or had been flagged by the VA as potentially violent ($n = 2$) were excluded from the study potentially introducing a selection bias. However the number excluded was small making it unlikely that any effect was significant. Also, since the data are cross-sectional inferences cannot be made about any causal relationship. In addition, a seasonal effect cannot be excluded since data were collected over a 5 month period. Another limitation is that there were differences in wording for questions used in deriving the veteran rating variable. The PHQ-9 phrase is 'better off dead or thoughts of physically harming yourself,' the phrase for past week passive SI is 'wished to be dead' and active SI the phrase is 'taking your own life.' Finally, information used to derive the psychiatrist rating of SI and behaviors was obtained from clinical notes, not a research tool. This introduced the potential for error in categorizing and coding the psychiatrists' rating.

3.4.2 Conclusion

The results of this study point to the need for assessment methods that complement the traditional unstructured patient assessment. Traditional assessment methods may have been sufficient when human and monetary resources were more abundant and when provider continuity was higher but with the current need to treat more people using fewer resources and the focus on measuring outcomes (which requires standardized assessments) (Valenstein et al., 2009) the time has come to adopt clinically relevant self-report assessments of acute suicide risk. Such an assessment would include not only questions about SI and behaviors but also about other risk factors such as intense affective states (Hendin et al., 2004; Rudd, 2008). Inconsistencies between the results of a self-report assessment and a face-to-face interview are opportunities for the clinician to delve further in order to resolve them and better identify individuals who hesitate to volunteer thoughts of killing themselves and individuals who actively conceal such ideation and plans but who may very well admit to feeling desperate, out of control, and trapped in unbearable psychological pain.

However, the usefulness of self-report will depend on whether the hurried and harried clinician is provided the results in an easy to review format and incorporates it into their assessment. To avoid adding just another form without substance to those already required, the self-report results will need to be directly entered into an electronic database (clinical record) where clinicians can be alerted to changes that indicate increasing or decreasing risk. This last step is essential in providing the clinical team with feedback on the effectiveness of the current treatment plan. Further research is needed to provide the basis for such a self-report that will help clinicians assess imminent suicide risk.

The text of Chapter Three, in part, will be submitted for publication as: McClure, J., Zisook, S., Criqui, M., Macera, C., Ji, Ming, and Nievergelt, C. (2012). "Agreement Between Self-Report and Psychiatrist Assessment of Suicidal Thoughts and Behaviors."

The dissertation author was the primary researcher and author.

Chapter 4

Acute and Sub-Acute Risk Factors for Suicide Attempts and Severe Suicidal Ideation

When making life and death decisions about when to hospitalize a patient who may be at risk for suicide, clinicians' choices often rely more on 'best guesses' than on solid, evidence based knowledge. While there is extensive evidence about chronic risk factors—features that predict lifetime risk, far less is known about sub-acute risk factors—predictors of serious suicidal behaviors within weeks to months. Even less is known about acute risk factors—predictors of serious suicidal behaviors within hours to days, the time period of greatest concern for clinicians.

Acute risk factors are useful to the clinician only if they are both very common in individuals at risk in the immediate time period of hours to days, and *uncommon* in individuals who are at low risk. As yet, no acute risk factors have been established that are sensitive enough to guide clinical decisions. Instead, clinicians depend primarily on their clinical judgment in order to focus interventions on those most in need.

Recently, an American Association of Suicidology sponsored panel proposed a set of suicide warning signs (acute risk factors termed) (Rudd et al., 2006). They suggest that suicide warning signs differ from chronic (long-term) risk factors not only in time frame but also in a number of clinically important ways. Suicide warning signs are subjective and specific to the current state of the individual and are transient, episodic, and most likely to be useful as a

constellation rather than as individual signs. Unlike most chronic suicide risk factors, warning signs are also modifiable and thus if singly or in clusters they indicate increased risk of suicide, clinicians will be armed with important data in making life and death decisions.

Warning signs may be viewed as fitting into three groups: 1) suicidal ideation (thoughts) and direct behaviors, 2) behaviors indirectly related to suicide, and 3) intense affective states (sustained emotions). Suicidal ideation (SI) includes passive ideation (the wish to be dead) and active ideation (thoughts of committing suicide). Suicidal behaviors include preparation of a suicide plan such as hoarding pills or obtaining a gun.

Indirect behaviors include acting recklessly or engaging in risky activities; withdrawing from family, friends, and society; the inability to sleep or sleeping excessively; and increased drug or alcohol use.

Intense affective states are anxiety, agitation, anger, rage, feeling trapped, hopelessness, dramatic changes in mood, and no reason for living—no sense of purpose in life. Additional warning signs, suggested by the work by Hendin and colleagues, and included in the present study are feelings of desperation, abandonment, self-hatred, and loss of control (Hendin et al., 2007).

This study aims to help clinicians answer two related questions. First, are there characteristics which distinguish individuals requiring immediate hospitalization for a suicide attempt or severe SI (acute risk) from those not at acute risk. Second, are there characteristics which distinguish individuals at risk for a suicide attempt or severe SI requiring hospitalization in the following 12 months (sub-acute risk) from those not at sub-acute risk. If there are unique features that distinguish these groups, clinicians will be armed with important data in making life and death decisions.

Previous studies have found that intense affective states are present in individuals just prior to a suicide attempt or death by suicide but many of these studies lack a comparison group to determine the prevalence of specific affective states in non-suicidal individuals. Our study of a general psychiatric population not only includes a comparison group but a sample similar to that seen in many

outpatient clinics.

To accomplish this aim, a self-administered survey was used to assess the presence and frequency of past one week suicide warning signs and to gather data on sociodemographic and clinical characteristics of veterans attending a psychiatric emergency service. One year later the medical records of study participants were reviewed to determine whether the participant had experienced a suicide attempt or hospitalization for severe SI.

4.1 Methods

4.1.1 Setting

The Psychiatric Emergency Department (PEC) at the San Diego Veterans Administration (SD VA) Medical Center is open weekdays from 8am to 5pm. Providers include a psychiatric nurse (PEC Coordinator), a second year psychiatric resident, an attending psychiatrist, and a pharmacist specializing in psychiatric pharmacology. The PEC coordinator determines whether the veterans' needs are best met through a complete PEC evaluation or through other means. Alternate dispositions include a same day appointment with the veterans' regular psychiatrist, an alcohol and drug treatment intake, a prescription refill provided by the psychiatric pharmacist, or a full mental health assessment through the Same Day Access Clinic.

4.1.2 Sample

Participants were all veterans who checked into the PEC between January and May of 2010 regardless of disposition. Exclusion criteria were previous enrollment in the study; a medical record flag for history of violent behavior; acute intoxication; a diagnosis of dementia, acute psychosis, or confusion; visible intense agitation or anger; and impaired decision-making capacity by formal or informal evaluation. Out of 911 total visits to the PEC during the five month study period, 154 (17%) were repeat visits leaving 757 unique veteran visits.

Of these 757 veterans, 38 could not be accessed by the researcher and 107 did not qualify, leaving 612 veterans who met study criteria. Of these 612 veterans, 106 (17%) refused to participate resulting in a participation rate of 83%. Twenty-four veterans either could not complete the survey or their survey's were unusable for a final sample size of 482. Compared to all veterans seen in the PEC in June of 2010, study participants were significantly younger (46.6 *vs.* 49.3 years of age, $p = .016$), but did not differ by gender or service war era.

4.1.3 Protocol

The study was approved by the University of California, San Diego institutional review board (IRB) and the San Diego VA research committee. In accordance with California state law and IRB requirements, veterans were informed during the consent process that endorsement of any current (SI) or behavior on the survey or verbally, would be reported to the clinical staff. Following consent, veterans were asked to complete the self-administered survey. This was generally done before assessment by the clinical staff, but if time did not allow, the veteran completed the survey between or after assessments by a clinician(s).

4.1.4 Measures

Survey (independent variables)

The survey included questions about the eighteen suicide warning signs, history of suicide attempts (SA), and sociodemographics as well as validated instruments to assess for three clinical characteristics; major depressive disorder (MDE), alcohol misuse, and post traumatic stress disorder (PTSD). The warning signs questions were a modified version of the Depression and Suicide Screening Project Survey developed by suicide experts at the American Foundation for Suicide Prevention (Garlow et al., 2008). Participants were asked to rate on a 4 point scale of not at all (0), several days (1), more than half the days (2), and nearly every day (3), how often during the past one week they

experienced; ‘intense anxiety or anxiety attacks’, ‘intense agitation’, ‘intense anger or rage’, ‘hopeless’, ‘desperate (an urgent need for relief)’, ‘out of control’, ‘trapped, no way out’, ‘abandoned by others’, ‘intense self-hatred’, and ‘dramatic changes in mood (for example from energetic and happy to depressed or angry)’. In addition, they were asked if during the past week they had ‘taken prescription medications your doctor did not order or more than your doctor ordered’, or ‘used drugs (such as marijuana, cocaine etc)’ with possible responses of not at all (0), once (1), 2–3 times (2), and more than 3 times (3). Using the same scale participants were then asked five questions about suicidal ideation and behaviors: during the past week have you ‘wished to be dead’ (passive ideation), ‘thought about taking your own life’ (active ideation), ‘hurt yourself or put yourself in danger’ (acting reckless or engaging in risky activities), ‘planned ways of taking your own life’ (looking for ways to kill self), or ‘made preparations such as saving up pills or getting a gun’ (seeking access to a method). Finally, participants were asked (yes or no) whether or not during the past week they were ‘drinking more alcohol’ or ‘using drugs more often’ and whether they were ‘withdrawing from family, friends, and life in general’.

To assess current MDE we asked participants to complete the nine question Patient Health Questionnaire 9 (PHQ-9). The PHQ-9 has been validated in two large multi-site studies (Spitzer et al., 1999; Spitzer et al., 1994). The PHQ-9 asks about symptoms during the past two weeks based on the DSM-IV (American Psychiatric Association, 1994) criteria for a major depression. We increased the threshold for frequency of symptoms from ‘more than half the days’ to ‘nearly every day’ so that only the participants most likely to have a clinically meaningful MDE were included. MDE was considered present if the respondent endorsed ‘feeling down or depressed or hopeless’ or ‘feeling a lack of interest or pleasure in doing things’ nearly every day and endorsed five or more questions total as present ‘nearly every day’ in the past two weeks (the question regarding SI is considered positive if several days or more frequent is endorsed) (Kroenke et al., 2001). Depression severity was measured using the total score with 0–4 considered no depression, 5–9 mild, 10–14 moderate, 15–19 moderately

severe, and 20–27 severe depression (Kroenke et al., 2001). To assess for alcohol misuse (hazardous drinking or an alcohol use disorder, AUD) we asked participants to complete the three-question Alcohol Use Disorders Identification Test (AUDIT-C). The AUDIT-C is a screening instrument that has been validated in VA veterans (Bush et al., 1998) and the general population (Dawson et al., 2005). Alcohol misuse was considered present if the total score was 5 or greater for men and 4 or greater for women (Dawson et al., 2005).

To assess for PTSD we asked participants to complete the four-question Primary Care Post Traumatic Stress Disorder scale (PC-PTSD) (Prins et al., 2003). The PC-PTSD is a screening instrument that has been validated in primary care (Prins et al., 2003) and other populations such as soldiers returning from combat (Bliese et al., 2008), and VA veterans in treatment for a substance use disorder (Kimerling et al., 2006). The screen was positive if the total score was 3 or greater (Prins et al., 2003).

Suicidal Crisis (dependent variable)

The study outcome event was a suicidal crisis manifesting as either a SA with or without hospitalization, or hospitalization for severe SI. Although all of the veterans seen on the day of enrollment who had an SA were hospitalized, during the 12 month follow-up period three veterans reported a SA within the past week but were not hospitalized. These three veterans were categorized as having an event.

Follow-up outcomes were obtained through a review of the VA centralized computer medical record. A hospitalization was considered to meet the outcome (event) criteria if the psychiatrist indicated that the primary reason for hospitalization was an SA or SI. In other words, for the outcome of hospitalized for severe SI, that the veteran's SI was severe enough to warrant hospitalization independent of any other reason(s) for hospitalization. A suicide attempt was considered to have occurred if it was documented as such in a psychiatrist's notes in the VA medical record. When more than one hospitalization occurred during the follow-up period only the first was counted. For the 12 month follow-

up study, any new entry into a veteran's VA medical record that indicated the veteran was still receiving care at the VA constituted follow-up time. The veteran was considered to have no event if the veteran's medical record had no documentation of a SA or hospitalization for SI during the follow-up time period.

4.1.5 Statistics

In the first phase, exploratory factor analysis (EFA) was used to look for common factors influencing the observed data on suicide warning signs (independent variables) and to examine the strength of any factors (factor loadings). The goal of EFA is to better understand the sources of correlation (common factors) underlying the data. The underlying factors were used in analysis as 'clusters of warning signs' that might distinguish veterans who have an immediate event from all other veterans, and those who have a 12 month event from veterans with no event. The analysis was exploratory because there is relatively little theoretical or empirical data to make strong assumptions about the underlying constructs for suicide warning signs.

The first step was to determine whether EFA was appropriate by examining the correlations between the suicide warning signs. Strong correlations were found suggesting that suicide warning signs may cluster together and that the clusters may represent underlying constructs (factors) making EFA appropriate.

Next, a correlation matrix suitable for ordinal data (polychoric) was chosen. At this point, past week active suicidal ideation was removed from analysis due to a correlation near 1.0 ($r = 0.95$) suggesting multicollinearity. The data were not normally distributed so the method chosen for the extraction of factors was principal factors which does not require assumptions about the underlying distribution (Fabrigar et al., 1999). Squared multiple correlations from the polychoric correlations were used for prior communalities estimates in the extraction because it was expected that variables would have differing importance (Cody and Smith, 1997). It was also expected that the underlying constructs (factors) were correlated so factors were rotated using an oblique (promax) rotation

rather than orthogonal rotation (Costello and Osborne, 2005). In interpreting the factor loading pattern, variables that loaded at ≥ 0.40 on a given factor and < 0.40 on the other factors were considered meaningful (Hatcher, 1994).

The following *a priori* guidelines were established for deciding how many factors to retain: 1) the results of the scree test, 2) the proportion of variance in the data explained by each factor (eigenvalue), and 3) the interpretability of the factors. To examine the internal consistency of the factors, Cronbach's alpha was calculated.

In the second phase of the analysis, logistic and Cox proportional hazard (Cox PH) regression were used. Logistic regression (two-tailed, alpha .05) was used to explore the association between individual warning signs, clusters of warning signs (*i.e.* factors), and clinical and sociodemographic characteristics from the survey; and veterans with an immediate event compared to veterans with no immediate event. *A priori* power was calculated using PASS 2005 software (Hintze, 2006) based on prior literature and estimates by the attending psychiatrist in the PEC. For a two-sided test with alpha level of .05, an outcome (hospitalization) rate of 9% and a 40% prevalence for the independent variable, a sample of 463 would provide 80% power to detect a clinically significant odds ratio of 2.2.

The factor variables, past week suicidality and affective states, were designated as the sum of the scores for each contributing variable. Past week suicidality was used as a dichotomous variable with 0 points as 'no' and > 0 'yes'. The factor variable for affective states was fairly evenly distributed and so it was divided into quartiles for easier interpretations by clinicians. The individual suicidal ideation and behaviors variables (passive ideation, active ideation, a suicide plan, preparation of a plan, and engaging in risky behavior or hurting oneself) in both regression analyses were used in a mutually exclusive form to increase the usefulness of regression results for the clinicians.

Cox Proportional Hazard (PH) regression was used to analyze the 12 month follow-up data. Further examination of the data and study design however suggested that Cox PH analysis of the follow-up data would be preferable

to logistic regression as it allows differing lengths of follow-up time. The same variables were used for the Cox PH as for the logistic regression analysis except for the inclusion in the outcome of a SA even if the veteran was not hospitalized. Because Cox PH was not included in the initial statistical plan power was not calculated *a priori*.

Multivariate analysis for both logistic regression and Cox PH was exploratory with all variables placed in the model and a stepwise backward method for variable selection.

The EFA was performed using SAS/STATtm software version 9 (SAS System Inc., Cary NC.) All other analyses except power were performed using SPSS software version 18 (SPSS Inc. Chicago, IL.)

4.2 Results

4.2.1 Sample characteristics

The sample were mostly men (89%), middle aged (mean age=47 years), and Caucasians (63%). Seventy-five percent attended college but only 15% were employed full time. The majority were either separated (12%), divorced (34%), or never married (23%). Ten percent considered themselves homeless. About half (47%) were veterans of the Persian Gulf War era. Thirty-three percent met study criteria for MDE. All of the participants with MDE had moderately severe to severe depression by the PHQ-9 severity scoring method. Fifty percent of respondents screened positive for PTSD and 22% screened positive for alcohol misuse. In addition, 18% of participants reported using drugs in the previous week. The mean number of psychiatric or substance use disorders was 2.4 (SD, 1.14) Table 2.1. In the follow-up portion of the study, 90.2% of veterans without an event were followed for the full 12 months. Censored cases occurred each month and ranged from 1 to 6 per month for a total of 38 cases (Appendix Figure A.4.

4.2.2 Exploratory Factor analysis

Step 1: Determination of the number of retained factors.

We concluded that only two meaningful factors were present. The scree test in Figure 4.1 shows a sharp break before factor three suggesting that only the first two factors were meaningful. A two factor solution was also supported by the percent of variance accounted for by each factor. The first factor accounted for 79% of the variance in the data and the second 14%. However the third factor accounted for only four percent and the fourth two percent. Finally, only one variable loaded exclusively on factor three, sleep, and none on factor four. Thus factor three and four were not retained.

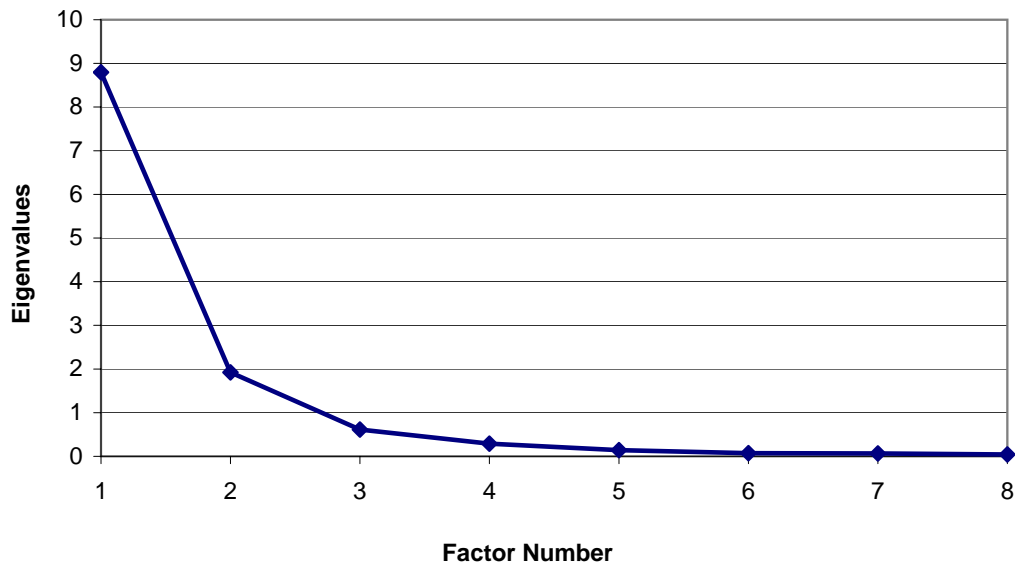


Figure 4.1: Scree plot showing the amount of variance accounted for by each factor.

Step 2: Rotation of the factors

The rotated factor pattern loadings and factor structure loadings as well as the final communalities from the promax rotation are shown in Table 4.1. The pattern loadings are expressed as standard regression coefficients and show

Table 4.1: Survey items and corresponding factor loadings from the rotated factor pattern matrix (correlations) and the factor structure matrix (standard regression coefficients) and final communalities.

Survey items ^d	Factor Pattern ^a		Factor Structure ^b		h ²
	Affective States	SI ^c and behaviors	Affective States	SI ^c and behaviors	
Intense agitation	89	-10	83	39	70
Rage or intense anger	80	-7	76	37	58
Desperate (urgent need for relief)	79	12	86	56	74
Intense anxiety or anxiety attacks	77	-13	70	30	50
Dramatic changes in mood	75	-3	73	39	54
Feeling out of control	70	20	81	59	69
Feeling trapped, no way out	69	26	83	64	74
Abandoned by others	62	17	71	51	52
Feeling hopeless	60	33	78	66	69
Intense self-hate	57	30	74	62	60
Trouble falling asleep, staying asleep or sleeping too much	50	11	57	39	33
Withdrawing from family, friends, life in general	46	27	61	53	42
Planned ways of taking own life	-9	99	46	94	89
Made preparations (e.g. saving up pills or getting a gun)	-5	90	46	88	77
Wished to be dead	12	85	59	91	85
Hurt your self or put your life in imminent danger	3	73	44	75	57

All variables are past week except sleep which is past 2 weeks. Loadings of ≥ 40 (in bold) were considered meaningful in interpreting the factors.

^a Factor pattern loadings are from the rotated matrix and are expressed as standard regression coefficients.

^b Factor structure loadings are from the unrotated matrix and are correlation coefficients between variables and factors.

^c SI=suicidal ideation. Values have been multiplied by 100 and rounded.

^d The suicide warning sign 'increased substance use' did not load on either factor and is not included in the table. The suicide warning sign 'active SI' was not included due to collinearity.

h² is the final communality for the row variable (the percent of variance in the observed variable that is accounted for by the two factors of affective states and past week suicidality).

the unique contribution that each factor makes to the common variance of the variable. This matrix was used to decide which variables loaded in a meaningful way on each factor and to interpret the meaning of the factors. The structure loadings show how the variables are related to the factors. Loadings are correlation coefficients between the variables and the factors. Final communalities show the proportion of common variance of each variable that is accounted for by the two factors.

Step 3: Interpretation of the factors

One variable (increased substance use) did not load on either factor and was excluded from further analysis.

Twelve variables were found to load on factor one which was labeled ‘affective states’: anxiety, agitation, anger, rage, trapped with no way out, hopelessness, dramatic changes in mood, desperation, abandonment, self-hatred, and loss of control, withdrawing from others, and difficulty sleeping.

Four variables loaded on factor two which was labeled ‘past week suicidality’: passive SI, a suicide plan, preparing a suicide plan, and acting recklessly or engaging in risky activities.

The inter-factor correlation is 0.43 suggesting a moderate positive correlation between the two factors (*i.e.* higher levels of affective states are associated with higher levels of past week suicidality). Cronbach’s alpha for the affective states factor was 0.93 and for past week suicidality factor, 0.82, showing high internal consistency.

4.2.3 Association of individual suicide warning signs, factors, and clinical and sociodemographic characteristics with SA and hospitalization for SI

Table 4.2 shows frequencies of the suicide warning signs, the two factors from the EFA, and clinical and sociodemographic characteristics by event (outcome) status. All of the veterans immediately hospitalized were men, and

Table 4.2: Suicide warning signs and clinical and sociodemographic characteristics, by suicide attempts and hospitalization for severe suicidal ideation in veterans attending a psychiatric emergency clinic. n=479¹

	None ^a		12 mo event ^b		Immediate event ^c	
	n	(%)	n	(%)	n	(%)
Passive SI (suicidal ideation) ^{d,e}	67	(17)	9	(20)	0	(0)
Active SI ^{d,e}	35	(9)	6	(13)	4	(13)
Suicide Plan ^{d,e}	47	(12)	13	(28)	9	(29)
Plan preparation ^{d,e}	34	(9)	5	(11)	17	(55)
Risky behaviors or hurt self ^{d,e}	4	(1)	1	(2)	0	(0)
Sleep ^e	348	(88)	42	(91)	31	(100)
Anxiety ^e	294	(74)	39	(85)	23	(74)
Agitation ^e	285	(72)	43	(94)	28	(90)
Anger ^e	209	(53)	28	(61)	23	(74)
Hopelessness ^e	263	(67)	34	(74)	30	(97)
Desperation ^e	266	(67)	33	(72)	30	(97)
Out of control ^e	206	(52)	25	(54)	27	(87)
Trapped ^e	244	(62)	36	(78)	29	(94)
Abandoned ^e	217	(55)	35	(76)	23	(74)
Self hate ^e	158	(41)	27	(59)	22	(71)
Dramatic changes in mood ^e	260	(66)	36	(78)	25	(81)
Increased substance use	72	(18)	14	(30)	11	(36)
Withdrawing	204	(52)	30	(65)	27	(87)
PTSD (survey)	190	(48)	24	(52)	21	(68)
MDE (survey) ^f	120	(30)	17	(37)	18	(58)
Alcohol misuse (survey)	81	(21)	16	(35)	8	(26)
History of suicide attempt	120	(30)	27	(59)	23	(74)
Sex (male)	348	(88)	42	(92)	31	(100)
	median	[IQR]	median	[IQR]	median	[IQR]
Affective states ^g	13	[16]	16	[13]	24	[10]
Past wk suicidality ^h	0	[2.0]	1.5	[4.0]	7.0	[4.0]
Age (yrs)	49	[21]	50	[24]	51	[14]

The numbers in the table body are the number and percent or median and inter-quartile range, (IQR) of veterans who endorsed a category other than "none" or "not at all" for the row variable.

¹ Three veterans (of 482) did not consent to the follow-up study.

^a None =no SA and not hospitalized for SI,

^b 12 mo event=SA or hospitalized for severe SI within 12 months of study enrollment

^c Immediate event=SA or hospitalized for severe SI day of study enrollment

^d Mutually exclusive categories

^e Categories collapsed from 4 categories to none or not all vs. all other categories.

^f MDE=major depressive episode based on the PHQ-9 symptom questions.

^g Affective states factor is the total score from all of the variables for the affective states factor (exploratory factor analysis)

^h Past week suicidality factor is the total score from all of the variables that contribute to the factor (exploratory factor analysis).

all had hopelessness and insomnia/hypersomnia during the prior week. None of them endorsed 'risky behaviors or hurt self' exclusively suggesting that this warning sign is usually accompanied by an additional manifestation of SI or behavior. Of the 56 veterans who endorsed past week preparation of a suicide plan, 39 (71%) were not immediately hospitalized. Of those, five (13%) had either an SA or hospitalization for severe suicidal ideation within 12 months.

Table 4.3 provides univariate logistic regression analyses comparing veterans who were hospitalized for SA or SI the day of the survey with those who were not. As would be expected from the literature, veterans who were immediately hospitalized had significantly higher odds of self-reporting a current suicide plan and preparation of a suicide plan as well as current MDE, a positive screening for PTSD, and a history of SA. Higher odds were also found for self-reporting all of the intense affective states except anxiety, agitation, abandonment, and dramatic changes in mood. In multivariate analysis using stepwise backward method of variable selection, veterans who were immediately hospitalized had a thirteen fold higher odds of reporting they felt out of control. Wide confidence interval reflects low proportion of veterans who were immediately hospitalized and did not endorse feeling out of control ($n = 4$) (Table 4.4). Other variables that had a strong positive association in the univariate analysis were either no longer significant, greatly attenuated, or in the case of anxiety became significant.

Table 4.5 provides univariate Cox PH analysis of the 12 month follow-up data for veterans who were not hospitalized the day of the survey. Veterans who self-reported intense anxiety, agitation, feeling abandoned, trapped, and intense self-hatred as well as increased substance use and a positive screening for alcohol misuse during the past week, were twice as likely to have a SA or be hospitalized for severe SI in the 12 month follow-up period than veterans who did not endorse these warning signs. Notably, the hazard ratio for veterans who endorsed a suicide plan, intense agitation, or increased substance use in the past one week was of a similar magnitude to the odds that veterans hospitalized immediately endorsed those suicide warning signs. Based on a sample size of

Table 4.3: Unadjusted odds ratios of suicide warning signs in veterans hospitalized for suicidal ideation or a suicide attempt^{a,b}.

Variable	Immediate vs. all others		n=482
	Odds ratio	95% CI of odds ratio	
Passive SI (suicidal ideation) ^{d,e}	n/a 0%		n/a = not applicable because all or none of the hospitalized veterans had the warning sign or characteristic.
Active SI ^{d,e}	1.44	0.48 - 4.32	
Plan^{d,e}	2.52	1.11 - 5.72	
Plan preparation^{d,e}	12.1	5.58 - 26.4	^a Reference category for <i>dependent</i> variable is not hospitalized immediately.
Risky behaviors or hurt self ^{d,e}	n/a 0%		
Sleep ^e	n/a 100%		^b Reference category for <i>independent</i> variables is "no" or "none" unless otherwise indicated.
Anxiety ^e	1.20	0.48 - 3.02	
Agitation ^e	3.52	0.94 - 10.58	^d Past week suicidal ideation and behaviors are mutually exclusive.
Anger^e	2.35	1.03 - 5.37	
Hopelessness ^e	n/a 100%		^e Categories collapsed from 4 categories to 2: none or not all vs. all other categories.
Desperation^e	13.9	1.87 - 103	
Out of control^e	6.09	2.10 - 17.7	^f MDE=major depressive episode based on the PHQ-9 symptom questions.
Trapped^e	16.3	2.20 - 121	
Abandoned ^e	2.07	0.91 - 4.72	^g Affective states factor is the total score from all of the <i>significant</i> variables for the affective states factor (exploratory factor analysis) in quartiles.
Self hate^e	4.77	1.90 - 12.0	
Dramatic changes in mood ^e	1.94	0.78 - 4.83	^h Past week suicidality factor is the total score from all of the variables for the SI and behaviors factor (exploratory factor analysis).
Increased substance use	2.30	1.06 - 4.98	
Withdrawing	7.69	2.30 - 25.7	
PTSD (survey)	2.19	1.01 - 4.75	
MDE (survey)^f	3.08	1.47 - 6.45	
Alcohol misuse (survey)	1.27	0.55 - 2.93	
History of suicide attempt	5.69	2.49 - 13.0	
Affective states factor^g 0 — 6	1.00		
7 — 14	4.32	0.48 - 39.2	
15 — 22	10.2	1.27 - 81.5	
23 — 34	19.9	2.61 - 152	
Past week suicidality factor			
0 (ref) vs. > 0	39.1	5.28 - 289	
Sex (ref is female)	n/a 100%		
Age			
20 to 29	1.00		
30 to 39	3.09	0.58 - 16.4	
40 to 49	2.27	0.43 - 12.0	
50 to 59	3.89	0.86 - 17.6	
60 +	2.50	0.47 - 13.3	

Table 4.4: Multivariate odds ratios of hospitalization for suicidal ideation or a suicide attempt by suicide warning signs and clinical characteristics in veterans attending a psychiatric emergency clinic^{a,b}

Variable	Immediate vs. all others	
	Odds ratio	95% CI of odds ratio
Out of Control ^c	13.0	1.67 - 101
Trapped ^c	1.04	1.00 - 1.74
Past week suicidality factor (0-12) ^d	1.52	1.33 - 1.74
Intense anxiety ^c	0.21	0.06 - 0.79

^a Reference category for *dependent* variable is not hospitalized immediately.

^b Reference category for *independent* variables is "no" or "none" unless otherwise indicated.

^c Categories collapsed from 4 categories to 2: none or not all vs. all other categories.

^d Past week suicidality factor is the total score from all of the variables for the SI and behaviors factor (exploratory factor analysis).

479 and event rate of 10% power was 95% at alpha 0.05 to detect a HR of 1.10. In multivariate analysis using stepwise backward method of variable (Table 4.6) selection, veterans who self-reported intense agitation were almost four times more likely to be hospitalized in the 12 month follow-up period, similar to the findings in the univariate analysis. However, all other variables were no longer significant except for history of a SA.

Table 4.7 shows the predictive ability of self *vs.* psychiatrist rating of SI and behavior for hospitalization during the follow-up period. While none of the psychiatrist ratings predicted future hospitalization, veteran's who self report of a current suicide plan were almost three times more likely and those with preparation of a plan two and a half times more likely to be hospitalized.

4.3 Discussion

We found that overall the frequency and intensity of the suicide warning signs were highest in veterans who were hospitalized immediately for a SA or

Table 4.5: Univariate hazard ratio of a suicide attempt or hospitalization for suicidal ideation within 12 months by suicide warning signs and clinical and sociodemographic characteristics in veterans attending a psychiatric emergency clinic^{a,b}.

Variable	Cox Proportional Hazard		N=448
	Hazard Ratio	95% CI of Hazard Ratio	
Passive SI (suicidal ideation) ^{d,e}	1.35	0.67 - 2.72	a Reference category for <i>dependent</i> variable is not hospitalized day of survey or during 12 month follow-up.
Active SI ^{d,e}	1.25	0.52 - 3.00	
Suicide Plan^{d,e}	2.08	1.08 - 4.03	b Reference category for <i>independent</i> variables is "no" or "none" unless otherwise indicated.
Plan preparation ^{d,e}	1.15	0.45 - 2.90	
Risky behaviors or hurt self ^{d,e}	1.70	0.23 - 12.3	d Past week suicidal ideation and behaviors are mutually exclusive.
Sleep ^e	1.42	0.51 - 3.95	
Anxiety ^e	1.88	0.84 - 4.20	e Categories collapsed from 4 categories to 2: none or not all vs. all other categories.
Agitation^e	3.87	1.39 - 10.8	
Anger ^e	1.29	0.71 - 2.33	f MDE=major depressive episode based on the PHQ-9 symptom questions.
Hopelessness ^e	1.29	0.68 - 2.45	
Desperation ^e	1.48	0.75 - 2.93	g Affective states factor is the total score from all of the <i>significant</i> variables for the affective states factor in quintiles.
Out of control ^e	1.00	0.56 - 1.77	
Trapped^e	2.16	1.07 - 4.35	h Past week suicidality factor is the total score from all of the variables for the SI and behaviors factor (exploratory factor analysis).
Abandoned^e	2.04	1.08 - 3.87	
Self hate^e	1.98	1.09 - 3.59	
Dramatic changes in mood ^e	1.82	0.90 - 3.65	
Increased substance use	1.91	1.04 - 3.54	
Withdrawing	1.45	0.81 - 2.60	
PTSD (survey)	1.26	0.71 - 2.22	
MDE (survey) ^f	1.12	0.61 - 2.04	
Alcohol misuse (survey)	1.95	1.07 - 3.57	
History of suicide attempt	2.84	1.58 - 5.10	
Affective states factor ^g 0--6	1.00		
7--14	2.48	1.02 - 6.05	
15--22	2.00	0.79 - 5.07	
23--34	2.24	0.89 - 5.64	
Past week suicidality factor^h	2.00	1.12 - 3.57	
Sex (ref is female)	0.92	0.36 - 2.31	
Age (10 yrs)			
20 to 29	1.00		
30 to 39	1.28	0.49 - 3.35	
40 to 49	0.68	0.24 - 1.88	
50 to 59	1.26	0.55 - 2.86	
60 to 69	0.44	0.13 - 1.46	

Table 4.6: Multivariate Cox PH final model for 12 month SA or hospitalized with SI (n=433, events=52).

	Cox Proportional Hazard	
	Hazard Ratio	95% CI of Hazard Ratio
History of suicide attempt	2.46	1.40 - 4.30
Intense agitation	3.89	1.40 - 10.8

severe SI, intermediate in veterans who made a SA or were hospitalized for severe SI during the 12 month follow-up, and lowest in veterans who did not have either.

Notably, prevalences in the veterans with neither outcome were remarkably higher than reported elsewhere (see for example (Hendin et al., 2004). For instance, consistent with Hendin and colleagues (Hendin et al., 2004) we found that the prevalence of both desperation (an urgent need for relief) and hopelessness in veterans who were immediately hospitalized for SA or severe SI was almost 100%. However, in contrast to Hendin’s findings of low prevalences in ‘seriously depressed but non-suicidal patients’ (0% for desperation and 8% for hopelessness) we found much higher prevalences in veterans whom clinicians did not consider to need hospitalization for SA or SI (68% and 67% respectively).

Table 4.7: Veteran and psychiatrist ratings of suicidal ideation and behaviors as predictors of 12 month suicide attempt or hospitalization for severe SI

	Cox Proportional Hazard			
	Veteran ratings, n=436		Psychiatrist ratings, n=336	
	Hazard Ratio	95% CI of Hazard Ratio	Hazard Ratio	95% CI of Hazard Ratio
No SI	1.0		1.0	
Passive only	1.8	0.85 - 4.0	1.0	0.2 - 4.3
Active only	1.9	0.72 - 4.8	1.4	0.4 - 4.7
Plan, no prep	2.8	1.3 - 5.8	3.6	0.9 - 15
Preparation of plan	2.5	1.0 - 6.0	1.8	0.2 - 13

This may be due to differences in sample size or study design and methods.

In univariate analysis, we found that veterans who were immediately hospitalized had greatly increased odds of reporting that in the past week they had withdrawn from others and were feeling self-hatred, out of control, and trapped. Unlike other reports, we did not find that veterans immediately hospitalized had higher odds of self-reporting intense anxiety or agitation (for example (Busch et al., 2003; Fawcett, 2007)). It is not surprising that we found very high odds for the past week suicidality factor considering that all but one of the veterans immediately hospitalized endorsed active SI with or without plan/preparation of plan and given that active SI with a plan is common criteria for hospitalization.

In the multivariate model only feeling out of control remained strongly and positively associated with immediate hospitalization while intense anxiety was negatively associated. The "protective" effect of anxiety is difficult to explain but it is interesting that the prevalence of anxiety was the same in veterans who had no event and those hospitalized immediately while it was higher in those with an event in the 12 month follow-up period.

In the multivariate model for risk of an event in the 12 month follow-up period only intense agitation and history of a suicide attempt remained significant factors. Psychomotor agitation has previously been noted to be associated with death by suicide in a 12 month prospective study (Fawcett et al., 1993) but it is not clear whether survey respondents were experiencing the same type of agitation.

Our finding that most of the intense affective states were strongly associated with a suicidal crisis (immediate hospitalization) may be of particular value for clinicians who find themselves with an individual who denies suicidal intent despite strong evidence of a suicidal crisis (such as deterioration in functioning and relationships) (Busch et al., 2003). In cases such as these the individual may admit to intense affective states allowing the clinician to address the inconsistency of their feelings with their denial of risk (*i.e.* "I'm not thinking about suicide.") When patiently confronted with the inconsistencies, the individual may acknowledge their suicidal thoughts and behaviors allowing

the clinician to take appropriate steps to decrease the risk of a suicide attempt or death by suicide (Rudd, 2008).

Comparing veteran and psychiatrist rating of SI and behavior with a 12 month event, only the veteran rating (self-report) of a current suicide plan or current preparation of a plan significantly predicted future hospitalization. This suggests that accurate detection by clinicians of the presence of a current suicide plan or preparation of a plan would benefit immediate as well as long term treatment planning. However, it is important to note that the sample size for the psychiatrist rating analysis was much smaller ($n = 436$ vs. $n = 336$) than that for the veteran rating because data was missing for the veterans who did not see a psychiatrist the day of the survey. This may explain why some cells had small numbers and thus wider confidence intervals. A larger sample size might have resulted in significant findings for the psychiatrist rating of a current suicide plan since *post hoc* power analysis showed 78% power to find an effect size of 3.5.

4.3.1 Limitations

A number of limitations need to be kept in mind when interpreting the results of this study. First, the suicide warning signs and clinical and sociodemographic characteristics are from a self-administered survey and may be biased by under or over reporting by the participant. However, over-reporting is unlikely as there would be little to gain by the participant. Participants were clearly told that if there were any indications of suicidal ideation or behaviors it would be reported to the clinician but that the survey itself would not be shown to anyone. Moreover, under reporting is of greater concern because this can result in missing clinically important information and potential harm to the individual. Studies suggest that individuals tend to reveal sensitive information at higher rates on computer, and pen and paper based surveys than during an unstructured interview with a clinician (for example (Levine et al., 1989)) In addition, our previous report did not find any evidence of significant over-reporting or under-reporting

A number of limitations are related to our outcome measure. We used a proxy outcome measure that includes both hospitalization for severe SI and a SA. Studies with a single outcome of a SA, would likely better reflect the true outcome of interest: death by suicide. However, such a study would require a much larger sample size with the accompanying increased cost. Such a cost is difficult to justify when there is little research on a topic. We believe the present study will contribute toward justifying a larger study.

An additional limitation related to our outcome measure is that it is derived from clinically based narrative notes rather than from an instrument designed for the study purpose. The use of clinically based narrative notes increases the risk of misclassification by the researcher due to insufficient or ambiguous clinical notes or due to observer bias. To decrease the risk of the former, two of the researchers rated notes that were unclear and a random sample of ratings were checked by a third researcher blinded to both the first researcher's ratings. To address the risk of the latter, both researchers were blinded to the survey results when rating the clinical notes.

The study results are also limited by the fact that the source of the outcome measure, the psychiatrists, were not blind to the results of the survey (in accordance with state law and IRB requirements the researcher notified the clinical staff whenever a veteran endorsed any SI or behaviors on the survey). Thus the outcome measurement could have been influenced by the survey results. However, our previous research found only fair agreement between the veterans self-report and the psychiatrist's assessment suggesting the psychiatrist was not significantly influenced.

In addition, the independent variables were derived from the veterans' self-report while the outcome was from the psychiatrists' report. The outcome classification might have been different if it were also derived from the veterans self report.

Another area of limitation is the cross sectional design of the study which precludes any inferences regarding cause and effect. An intense desire to commit suicide may *result in* rather than *arise from* affective states such as des-

peration and hopelessness. Although this seems unlikely, a prospective study design would provide a much better understanding of any temporal relationship between suicide warning signs and a suicidal crisis.

In addition, in the logistic regression analysis confidence intervals are quite wide for a number of variables. This could be the result of low power or low counts in some cells of the cross tabulation. For instance, desperation (OR 13.9, 95% CI 1.87,103) was reported by all but one of the veterans who were immediately hospitalized resulting in a cell size of 1. *A priori* we calculated power as 87% to detect an OR of 3 so it seems more likely that low cells counts are the source rather than low power.

Another limitation is that the veteran population may differ significantly from other populations limiting generalization. Historically, veterans utilizing the VA for basic care have been “poorer and sicker” (*e.g.* unemployed or on disability) than veterans who receive their care from non-VA sources.

Finally, in the current climate of increasingly limited resources, it is important to recognize that surveys such as ours are not intended to and cannot replace the clinician. They are instead intended to provide the clinician with an additional source of information on which to form their treatment plan.

4.3.2 Conclusion

Previous studies have found that intense affective states are present in individuals just prior to a suicide attempt or death by suicide but many of these studies lack a comparison group to determine the prevalence of specific affective states in non-suicidal individuals. The present study of a general psychiatric population not only includes a comparison group but a sample with a wide range of psychiatric disorders and needs similar to that seen in many outpatient clinics.

Our findings that suicide warning signs are strongly associated with a suicidal crisis must be balanced their high prevalence in individuals who were not in a suicidal crisis.

This illuminates the incredibly daunting challenges for clinicians working

in busy and often understaffed VA urgent care settings. They are asked to evaluate difficult, distressed, traumatized and depressed men and woman with past histories of SA (35%) and present SI (52%) (Chapter 2), almost all of whom endorse multiple features reflecting suicide risk.

The severity of psychopathology is underscored by the 6% of veterans who were judged to require immediate hospitalization for suicide risk and the 10% who ended up requiring admission in the next weeks to months. These harried clinicians are asked to make what might be life and death decisions in the absence of evidence-based guidelines for imminent suicide risk.

Current treatments by psychiatrists are often focused on pharmacological targets such as anxiety, agitation, and depression which may only indirectly help reduce feeling trapped, out of control, hopeless and desperate. Our findings demonstrate the need for therapies that can be initiated in a busy clinic setting such as the PEC and that target affective states such as desperation. In addition, continued research focused on identifying *clinically useful* acute risk factors is needed.

The text of Chapter Four, in part, will be submitted for publication as: McClure, J., Zisook, S., Criqui, M., Macera, C., Ji, Ming, and Nievergelt, C. (2012). "Suicide Warning Signs and Hospitalization for a Suicidal Crisis". The dissertation author was the primary researcher and author.

Chapter 5

Conclusion

5.1 Intention of the research program

Suicide risk factor research has focused almost exclusively on chronic risk (12 months or more) leaving clinicians with little empirical evidence for making decisions when treating individuals at acute (days to weeks) and sub-acute (weeks to months) risk. In addition, although the literature on acute and sub-acute risk has suggested that individuals often display warning signs in the form of intense affective states immediately before a suicide attempt or death by suicide (Hendin et al., 2004) with few exception these studies include only individuals who had attempted suicide or died from suicide and no comparison group. (For example (Busch et al., 2003).) Without corollary data from a control or comparison group the question remains open of whether suicide warning signs can be identified that *distinguish* between individuals at acute risk and those not at acute risk in a clinically meaningful way. In addition, to be effective in reducing death by suicide, clinicians must accurately detect warning signs. Previous literature suggested that the traditional method of assessment, an unstructured interview, does not detect suicidal thoughts and behaviors as well as other methods of assessment including a self- administered survey (for example (Bongiovi-Garcia et al., 2009)).

To address these questions we chose a self-administered survey to determine the prevalence of suicide warning signs in veterans attending a VA psychiatric emergency clinic (Chapter 2). We then examined agreement in ratings

of suicidal thoughts and behaviors between the treating psychiatrists' clinical notes and veterans' survey results (Chapter 3). Veterans noted by the psychiatrist to be seeking hospitalization by feigning SI or behaviors were excluded from the analysis.

To more directly address the question of whether suicide warning signs were specific to individuals at acute risk versus those at sub-acute risk, we followed the rest of the veterans for 12 months for any SA or hospitalization for severe SI. For both comparisons we looked at whether singly or as a cluster, the suicide warning signs distinguished veterans with an SA or hospitalization for severe SI immediately (Chapter 4).

5.2 Summary of findings

We found that suicide warning signs were highly prevalent in a general outpatient psychiatric population (Chapters 2). The lowest prevalence rate was 19% for past one week increased substance use and the highest 90% for insomnia or hypersomnia. Perhaps most striking was that only 3.1% of veterans ($n = 15$) did not endorse any warning signs and the mean number of signs endorsed was 7.6. When a history of SA was included with the suicide warning signs, only 2.3% ($n = 11$) did not make any endorsements (data not shown).

We found poor agreement between ratings of suicidal thoughts and behaviors from the psychiatrists' clinical notes and the veterans' survey self-report: 46% of the ratings were discordant (Chapter 3). Among the discordant cases, 97% ($n = 159$) of the time the veteran rating was more severe than the psychiatrist rating. The greatest frequency of disagreement occurred when the psychiatrist rated the veteran as having no SI at all and the veteran reported the presence of SI or behaviors. The same pattern was found when the data were stratified by type of psychiatrist (2nd year resident *vs.* staff psychiatrist), by presence of MDE, by a psychiatrist-documented history of a suicide attempt (SA), and by both MDE and psychiatrist-documented history of SA. When the 38 veterans who self-identified as homeless were excluded, the results did not

materially change. This suggests that disagreement was not due to veterans over rating their symptoms for the purpose of gaining food and shelter in the hospital.

The generalized McNemar test of symmetry was statistically significant indicating the disagreement was not spread evenly across the categories. In other words the psychiatrist and the veteran selected categories in differing proportions. Specifically, the psychiatrists consistently rated SI and behaviors as less severe than the veterans.

We concluded that the addition of self-report to the traditional unstructured psychiatric assessment has the potential to improve detection of suicide warning signs. Further research is needed to better understand the high rate of discordance.

We found that suicide warning signs were most prevalent in veterans who were immediately hospitalized for an SA or severe SI and intermediate in those who had an SA or were hospitalized for severe SI over the subsequent 12 months. However we also found a strikingly high prevalence of suicide warning signs in veterans who did not have any SA and were not hospitalized for severe SI. For example, the affective state of desperation which was present in a) 97% of veterans who were hospitalized immediately and b) 72% of veterans who were hospitalized for an SA or severe SI in the following 12 months, was also present in c) 67% of those veterans who did not have either event. This was also true for other suicide warning signs such as hopelessness (present in 97%, 74%, and 67% of veterans in groups a),b) and c) respectively).

We used the factors from exploratory factor analysis to test whether a cluster of warning signs (*i.e.* each factor) would be clinically useful. Results for both factors followed a pattern similar to that of individual warning signs.

Because few other studies of suicide warning signs have been published, the prevalence of suicide warning signs in other populations needs to be studied to confirm our results. In addition, a larger study which would allow an outcome of a suicide attempt or death by suicide rather than suicide attempt or hospitalization for severe SI would be helpful.

Finally, further research is needed to examine the utility of a structured (self- or clinician-administered) method of suicide risk assessment as a complement to the traditional unstructured assessment.

5.3 Limitations

A careful review of limitations is important for both the interpretation of the present study but also in planning additional research. Limitations related to internal validity and in particular information bias from the measurement instrument will be discussed first. Then, issues related to selection bias will be briefly touched on. Next limitation related to generalizability and precision will be addressed. Finally, limitation from study design features will be discussed.

5.3.1 Internal validity

5.3.2 Independent variable selection

The selection of independent variables is strongest when based on prior research and a theoretical framework for the phenomena being studied. However, research on death by suicide is in its infancy compared to many other areas of medical research and a dominant theory (schema) of death by suicide has not yet emerged. (Wenzel et al., 2009) In addition, a research basis and theoretical framework for suicide warning signs has not yet been established. Specifically, warning signs selected by the AAS were those “holding the most promise for eventual scientific verification.” (Rudd et al., 2006)

5.3.3 Dependent variable selection

For the longitudinal part of the study a proxy outcome was necessary because death by suicide is fortunately very rare. SA is a common proxy but the rate of SA even in a high risk population such as individuals with psychiatric disorders is very low. Resources for this study did not allow SA as the sole

outcome so we combined the outcome of SA with severe SI requiring hospitalization. Misclassification of the outcome will occur if proxy outcome does not accurately represent the actual outcome and combining two outcomes increases this possibility. The direction and extent of this misclassification is not measurable. It would be optimum if any future studies had a large enough sample size to analyze SA and severe SI separately.

5.3.4 Variable measurement

No single, validated, and self-administered instrument is available for suicide warning signs. The lack of a validated tool increases the probability of systematic measurement error and the resulting information bias and misclassification. It also prevents measuring the direction and extent of bias from the suicide warning signs portion of the survey. In addition, survey questions that ask about “states of mind” (*e.g.* feeling desperate rather than more quantifiable information (*e.g.* increased substance use) are more sensitive to misunderstanding by the participant resulting in bias. We hope the present study encourages research on the constructs underlying suicide warning signs which would allow survey questions to be developed based on these constructs using standard development methods. (Oppenheim, 1992) In addition, veterans who have a current prepared suicide plan and want to avoid detection may minimize their responses to some or all of the questions and veterans who are homeless or in difficulty with the law may desire hospitalization and maximize their responses resulting in misclassification. Misclassification would be differential if veterans with a characteristic related to the outcome and the independent variable are less likely to answer truthfully. We were able to take a number of steps to reduce the effect of over reporting (*i.e.* veterans who were homeless and those who were judged by the psychiatrist to be making suicide threats solely to obtain hospitalization were excluded from the analysis) but under reporting is more difficult to deal with. However, we expect that under reporters are more likely to answer truthfully questions that are not as clearly related to suicide such as feelings of desperation, thus strengthening the validity of those results.

Recall bias is inherent in studies that ask the participant to report on past events. Impaired recall can result in over reporting or under reporting of responses to survey items especially for the items that pertain to feelings rather than factual events. The direction and extent of any recall bias cannot be known as there is no source for verification. It may be that veterans who were hospitalized immediately or within the follow-up period recalled the past week frequency and severity of warning signs differently than those who were not hospitalized and did not have an SA. A study which depended only on the same day ratings would decrease recall bias but would not be as useful clinically because the fluctuating nature of warning signs dictates that the clinician look for them in at least the past week rather than just the day of the assessment.

Some degree of bias may also have occurred during extraction of psychiatrists' ratings from the medical record and during extraction of SA and hospitalization for severe SI during the follow-up portion of the study. We took care however to ensure that the person doing the extraction (J. McC) was blind to all other results.

5.3.5 Selection bias

Although perhaps of less concern than information bias in this study, several sources of selection bias must be considered. (Bias from convenience sampling is discussed under the precision portion of this section). First, the offer of a five dollar VA store coupon as compensation for study participation may have resulted in a selection bias with higher income veterans less likely to participate thus making the study sample less representative of all veterans coming to the PEC. As mentioned above, many veterans have low incomes (only 15% of participants were employed full time and 7% part time) and may participate only to receive the compensation. We were able to obtain data on three variables for all veterans who were seen at the PEC for the month following the study period. The three variables were available for comparison, age, gender, and service era. For the prevalence and the longitudinal portion of the study we found that participants were significantly younger but for the

agreement study no significant differences were found. Whether other more important or unknown characteristics are different cannot be determined but must be kept in mind.

Second, some adjustments in recruitment and survey administration were necessary as the study progressed. Initially the PEC clerk asked the veterans if a researcher could talk to them about the study. This was modified to the researcher making the initial approach because clerks were forgetting to ask and veterans were confused about what was meant. The result of this change was a higher participation rate and increased representativeness of the sample. In addition, initially we planned to administer the survey in a private room but this room was not available. We instead used an area of the waiting room. This however did not allow sufficient privacy and quiet especially when the waiting room was crowded or the survey had to be read to veterans who could not see adequately. In the second month of the five month study a small private room was then located and the survey was administered there. The effect may have been a decrease in quality of survey responses before the private room was located.

In longitudinal studies, validity is vulnerable to loss of data on participants who cannot be located for follow-up assessment. Bias in characteristics affecting the outcome occurs if there are significant differences between participants who are lost to follow-up and those who aren't. We compared those lost to follow-up with study participants on two variables related to the dependent and independent variables, alcohol misuse and depression. No significant differences were found suggesting that those lost to follow-up were not different on important characteristics.

5.3.6 Generalizability

The present study is of a population that shares several characteristics not found in other populations of psychiatric outpatients. First, they are all veterans. Though they do not all have combat experience they have all been members of the military who were discharged honorably. Second, they utilize

the VA health care system, although not necessarily exclusively. Historically, veterans utilizing the VA for basic care have been “poorer and sicker” (unemployed or on disability) than veterans who receive their care from non VA sources. In the current climate of increasing numbers of the U.S. population without employer-based health care coverage, veterans may be employed but have no other source of health care but the VA. However it is still likely that VA veterans are different in several important ways from non VA veterans and other populations. Finally, this study took place in a walk-in urgent care setting. Emergency psychiatric services differ greatly in their hours and services so that the present study results may not generalize to other walk-in outpatient psychiatric services. Replicating this study in other populations is important before generalizing the results.

5.3.7 Precision

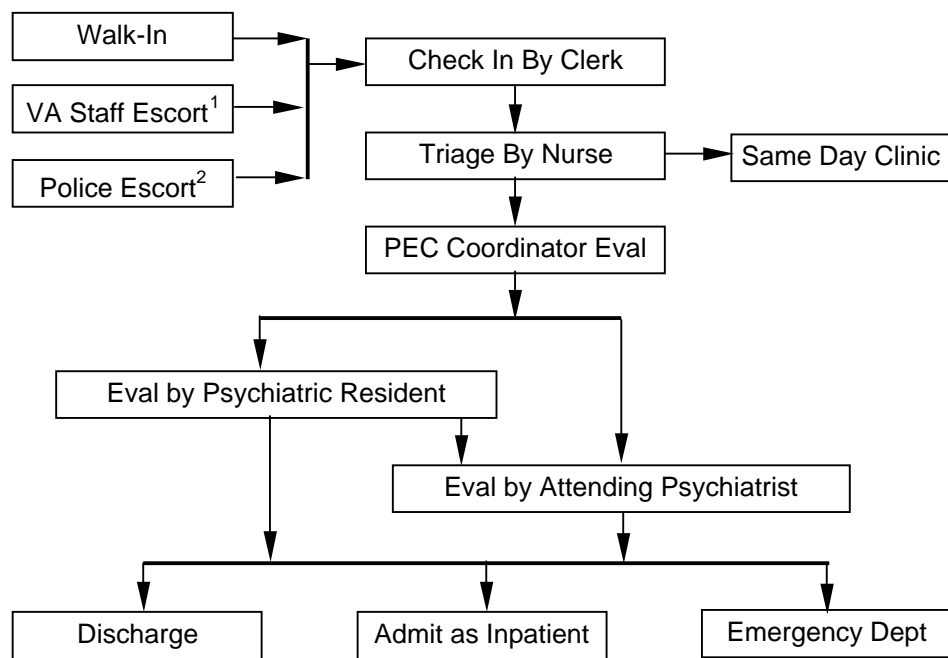
Two sources of loss of precision are important to note. First, wide confidence intervals indicate that a larger sample size would have increased precision. Second, the sampling method was not random. Although strong efforts were made to recruit all veterans who were eligible and attended the PEC during the five month study enrollment period, a random sampling method would likely increase the precision of the study results.

5.3.8 Study Design

Two main issues of study design are relevant to interpreting the results of the present study and planning additional studies. The first is the overall design. The present study primarily used a cross-sectional design which can only provide prevalence estimates. This was appropriate for the first part of the study because research is just beginning on suicide warning signs and for the second part which looked at agreement between the veteran and the psychiatrist. For additional studies, a longitudinal study with multiple surveys would provide incidence as well as prevalence measures of suicide warning signs. Second,

the agreement part of the study does not examine any sources of disagreement. This was appropriate for the initial study since there is little research in this area and we needed first to examine the degree, if any, of disagreement. However, additional studies of agreement could incorporate design changes to better understand sources of disagreement. The third part of the study (association of suicide warning signs with SA or severe SI requiring hospitalization) used a longitudinal design and logistic regression. In addition, although the longitudinal design of the present study allows for inference of a causal association, further research is needed before concluding that there is or is not a causal relationship.

Appendix A



1. VA staff determines veteran's needs.
2. Reasons for police escort is danger to self or others and refuses voluntary care, or is too mentally impaired to seek psych help independently.

Figure A.1: Flow chart of visitors to San Diego VA
Psychiatric Emergency Clinic

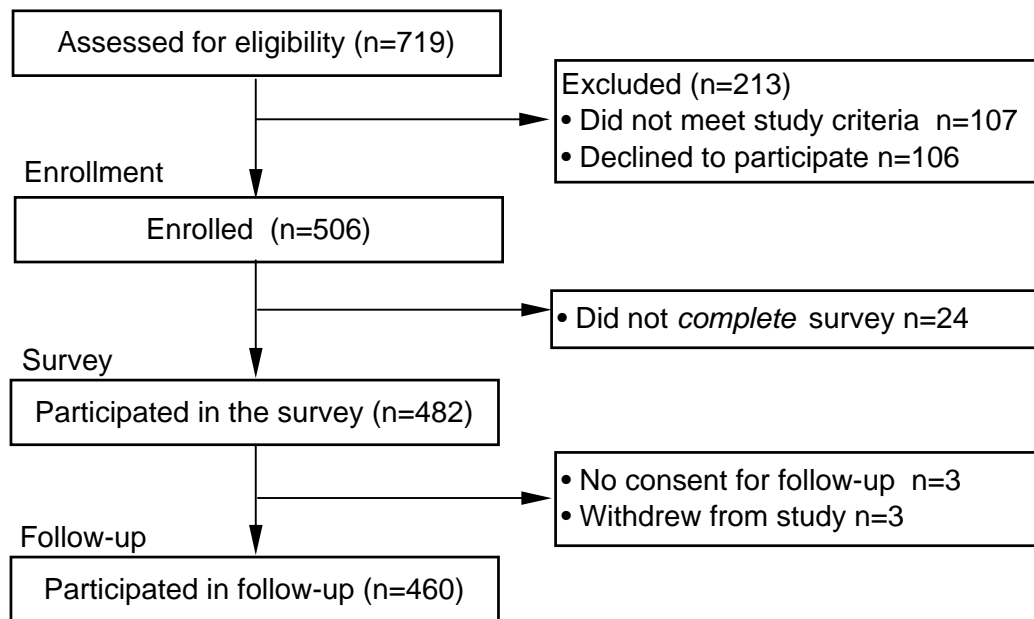


Figure A.2: Suicide warning signs, subject flowchart

Table A.1: Crosstabulation of veterans by clinical Characteristics. n=482

Alcohol misuse screen			Major Depression (MDE)	
			no	yes
no	PTSD screen	no	154	37
		yes	110	76
	Total	264	113	
yes	PTSD screen	no	30	19
		yes	30	26
	Total	60	45	

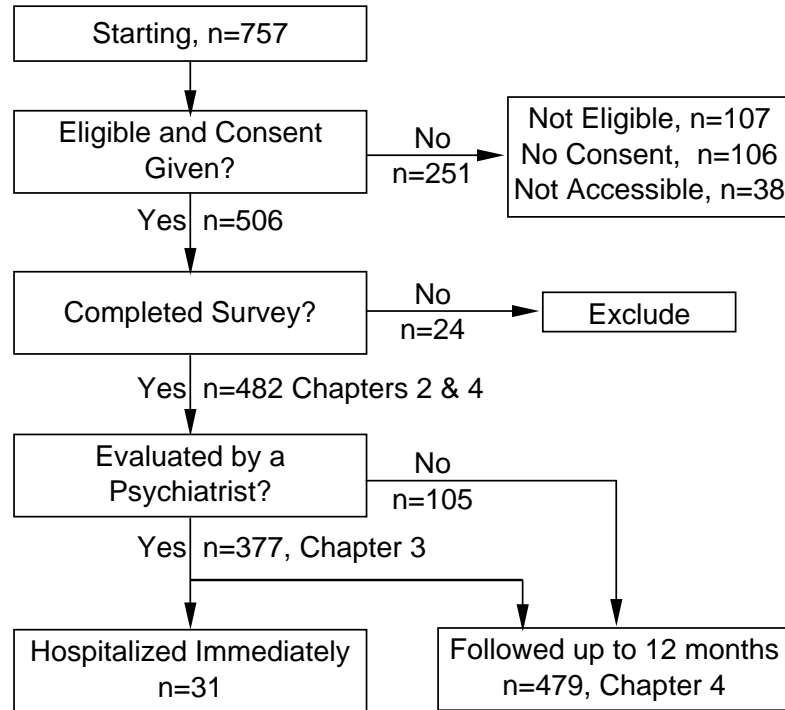


Figure A.3: Flow chart by dissertation chapter

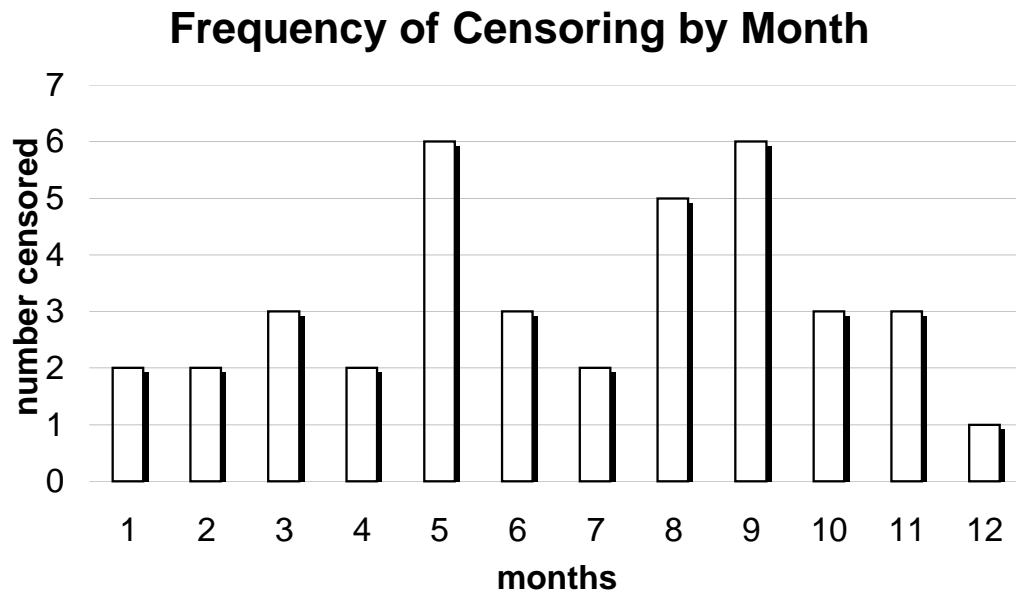


Figure A.4: Subjects lost to follow-up in Cox PH analysis

STRESS & DEPRESSION QUESTIONNAIRE¹

Please answer every question to the best of your ability.

1. During the <u>last 4 weeks</u> , how often have you been bothered by any of the following?	Not at all	Some of the time	A lot of the time	Most or all of the time
Feeling nervous or worrying a lot				
Becoming easily annoyed or irritable				
Feeling your life is too stressful				
Having arguments or fights				
Feeling intensely anxious or having anxiety attacks				
Feeling intensely lonely				
Feeling intensely angry				
Feeling hopeless				
Feeling desperate				
Feeling out of control				

2. During the <u>last 4 weeks</u> have you experienced any of the following?	Not at all	Some of the time	A lot of the time	Most or all of the time
Drinking alcohol (including beer or wine) more than usual				
Feeling like you were drinking too much				
Feeling that your work or school attendance or performance was affected by your drinking				
Using drugs (such as marijuana, cocaine, etc.) or taking prescription medications without medical supervision?				

3. Thinking now about the <u>last 2 weeks</u> , how often have you been bothered by any of the following problems?	Not at all	Some of the time	A lot of the time	Most or all of the time
Feeling tired or having little energy				
Having trouble falling or staying asleep, or sleeping too much				
Having a poor appetite or overeating				
Having trouble concentrating on things, such as reading the newspaper or watching television				
Feeling bad about yourself — or that you are a failure or have let yourself or your family down				
Moving or speaking so slowly that other people could have noticed? Or the opposite — being so restless that you have been moving around a lot more than usual				
Feeling a lack of interest or pleasure in doing things				
Feeling down or depressed				
Having thoughts that you would be better off dead or thoughts of physically harming yourself				

Figure A.5: AFSP stress & depression questionnaire

	Never	Once	2-3 times	More than 3 times
4. Having thoughts about taking your own life				
5. Done things to hurt yourself or put your life in imminent in danger				
6. Planned ways of taking your own life				
7. Have you ever made a suicide attempt?	Yes		No	

	Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
8. If you checked off <u>any</u> problems on this questionnaire, how <u>difficult</u> have these problems made it for you to do your work, take care of things at home, or get along with other people?				

	No	Yes
9. Are you currently taking any medication for anxiety?		
10. Are you currently taking any medication for depression?		
11. Are you currently taking any medication for stress?		
12. Are you currently taking any medication for sleep?		
13. Are you currently getting counseling or therapy?		

¹The American Foundation for Suicide Prevention (AFSP) and participating universities have collaborated to develop, implement, and evaluate the Depression and Suicide Screening Project, which incorporates a novel method of identifying, and referring for treatment, at-risk individuals who otherwise might not seek help.

Figure A.5 continued: AFSP stress & depression questionnaire

Subject ID #

Thank you for participating in this study.

Please answer the following questions to the best of your ability.

1 **Thinking about the last 2 weeks, how often have you been bothered by any of the following?**

	Not at all	Some of the time	A lot of the time	Most of the time
Feeling tired or having little energy				
Having trouble falling or staying asleep or sleeping too much				
Having a poor appetite or overeating				
Having trouble concentrating on things, such as reading the newspaper or watching television				
Feeling bad about yourself-or that you are a failure or have let yourself or your family down				
Moving or speaking so slowly that other people could have noticed? Or the opposite-being so restless that you have been moving around a lot more than usual				
Feeling a lack of interest or pleasure in doing things				
Feeling down or depressed or hopeless				
Having thoughts that you would be better off dead or thoughts of physically harming yourself				

2 **Thinking now about the last week, how often have you been bothered by any of the following?**

	Never	Once	2-3 times	More than 3 times
Feeling intensely anxious or having anxiety attacks				
Feeling intensely agitated				
Feeling rage or intense anger				
Feeling hopeless				
Feeling desperate				
Feeling out of control				
Feeling trapped, no way out				
Feeling abandoned by others				
Feelings of intense self-hatred				
Feeling dramatic changes in your mood (for example from energetic and happy to depressed or angry)				

3 **During the last week, how often have you done any of the following?**

	Never	Once	2-3 times	More than 3 times
Taken prescription medications that your doctor did not order or more than your doctor ordered				
Used drugs (such as marijuana, cocaine etc)				

4 **Have you ever witnessed or experienced an event that involved threatened or actual serious injury or death?**

No Yes

Figure A.6: Veteran survey

5 Within the past month, has the memory of this event troubled you to the point that it interferes with your sleep, concentration or relationships? No Yes

6 Within the past month, have you felt distant or cut off from other people? No Yes

7 Within the past month, have you been 'super alert' or watchful or on guard? No Yes

8 During the last week, have you been noticed that you:

	Yes	No
Are drinking more alcohol	<input type="checkbox"/>	<input type="checkbox"/>
Are using drugs more often (other than th	<input type="checkbox"/>	<input type="checkbox"/>

9 How often do you have a drink containing alcohol?
 Never Monthly or less Two to three times a week
 2 to 4 times per month Four or more times a week

10 How many drinks containing alcohol do you have on a typical day when you are drinking?
 1 or 2 3 or 4 5 or 6 7 to 9 10 or more

11 How often do you have six or more drinks on one occasion?
 never less than monthly monthly weekly
 daily or almost daily

12 Thinking about the last week, how often have you been bothered by any of the following problems? More than 3 times

	Never	Once	2-3 times	More than 3 times
A wish to be dead	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Thoughts about taking your own life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hurt yourself or put your life in imminent danger	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Planned ways of taking your own life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acted on a plan (for example saving up pills or getting a gun)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13 Thinking about the your entire life, how often have you been bothered by any of the following problems?

	Never	Once	2-3 times	More than 3
Has there <u>ever</u> been a period of two weeks when you felt you wanted to die?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have you <u>ever</u> felt so low you thought about committing suicide?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have you ever made a suicide attempt No	<input type="checkbox"/>	Yes	<input type="checkbox"/>	<input type="checkbox"/>
If yes, how many times? <input type="text"/> times				

Thank you for taking this survey. Jan McClure

Figure A.6 continued: Veteran survey

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