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Naturalistic Clinical Decision Making by Emergency Department Staff and the Assignment of Categorical Suicide Risk Ratings within an Urban Veteran Population

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Philadelphia College of Osteopathic Medicine

Department of Psychology

NATURALISTIC CLINICAL DECISION MAKING BY EMERGENCY
DEPARTMENT STAFF AND THE ASSIGNMENT OF CATEGORICAL SUICIDE
RISK RATINGS WITHIN AN URBAN VETERAN POPULATION

By Gerd R. Naydock, M.S.S., M.S.

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

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DEPARTMENT OF PSYCHOLOGY**

Dissertation Approval

This is to certify that the thesis presented to us by Gerd Naydock
on the 14 day of Jan, 2015, in partial fulfillment of the
requirements for the degree of Doctor of Psychology, has been examined and is
acceptable in both scholarship and literary quality.

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Abstract

The ability to comprehensively and effectively identify those individuals who are at greatest risk to engage in self-directed violence (SDV) forms the cornerstone for all professional suicide prevention activities. To that end, mental health professionals have come to rely on the use of risk stratification to identify at-risk individuals as a way to inform and guide risk management and treatment, without having the benefit of empirical evidence to support such practices. The current program evaluation examined archival data comprised of suicide risk assessments conducted by mental health professionals on suicidal veterans ($N = 1,560$) in the emergency department of a large, urban Veterans Administration medical center (VAMC) located in the northeastern United States over 2 years, as well as data for subsequent suicide attempts among this sample ($n = 110$). Results indicate that the current practice of stratifying suicide risk into specific categories (high, moderate, and low) effectively distinguishes the majority of those veterans who subsequently engaged in SDV from those who did not after being assessed by emergency department evaluators utilizing routine, naturalistic clinical judgment. Additional findings revealed that the categorical risk ratings of high, moderate, and low were distinguishable from one another, whereby a rating of high risk was more likely than both moderate and low risk to distinguish those suicidal veterans who subsequently engaged in SDV. Moderate risk identified at-risk veterans more accurately than those at low risk.

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Chapter 1

Introduction

Statement of the problem.

Suicide is one of the leading causes of death in the United States and is responsible for claiming the lives of over 38,000 individuals each year in this country and 1 million individuals annually throughout the world (Centers for Disease Control and Prevention [CDC], 2010; McIntosh & Drapeau, 2012, World Health Organization, 2002). Mental illness, substance abuse, personality traits, genetic predisposition, and cultural factors are all well-established factors that contribute to the epidemiology of suicide (Simon, 2012). Stressful life events are also significantly correlated with suicide (Heilä, Heikkinen, & Isometsä, 1999). Almost all mental health practitioners can expect to encounter a suicidal patient at least once during their careers, and most will find themselves working with an individual who has made one or more suicide attempts (Rogers, Guellette, Abby-Hines, Carney, & Werth, 2001). Nearly one fourth (23%) of mental health practitioners have experienced a patient suicide (McAdams & Foster, 2000), and the effects of this can be emotionally devastating for clinicians, further complicating the task of applying unbiased and objective clinical judgment to the task of suicide risk assessment (Hendin, Lipschitz, Maltzberger, Haas, & Wynecoop, 2000).

Although suicide may be a leading cause of death, the overall low base rate of suicide in the general population makes its consistent prediction impossible (Pokorny, 1983, 1993). No set of clinical risk factors assessed at a single point in time can reliably predict future suicide risk. Standardized risk assessments have not been successful in predicting suicide. Past attempts to increase their sensitivity to measure risk have

resulted in high false positive rates, whereas efforts made to increase their specificity have produced an increase in false negatives (Cassells, Paterson, Dowding, & Morrison, 2005; Mackinnon & Farberow, 1975; Simon, 2012).

In the absence of highly accurate, empirically validated, and reliable suicide risk assessment instruments, it becomes incumbent upon a skilled clinician to conduct a reasonable assessment utilizing clinical judgment in a systematized approach (Simon, 2009). There are a number of available models that inform approaches to systematized suicide risk assessment. All of these approaches require the clinician to carefully analyze and synthesize a large number of static and modifiable risk factors as well as risk-reducing protective factors that can provide important information regarding an individual's level of intent to engage in suicidal behaviors (Simon, 2009). Proper assessment of a suicidal patient's intent will inform treatment recommendations and level of care decisions. Those individuals who are assessed to be at high levels of risk are often psychiatrically hospitalized for their own safety, whereas individuals at lower levels of risk will generally be referred for specialty outpatient mental health services.

The distinction that clinicians make between low- and high-risk patients may seem fairly obvious to the professionals; however, quite often, suicidal patients will be rated at an intermediate or moderate level of risk (Ravindranath & Deneke, 2012). To date, no general consensus regarding the operational definition of intermediate or moderate suicide risk has been established. Moreover, although the assessment of intermediate suicide risk is a universally common practice, no research base exists supporting its ongoing use or clinical effectiveness.

Purpose of the study.

This program evaluation attempted to ascertain whether the current method of rating an individual's risk for suicide (i.e., low, moderate, or high) has clinical utility and final ratings accurately reflect the contribution of empirically supported risk factors. Additionally, this program evaluation aimed to understand how clinicians working in highly stressful and time-constrained hospital emergency departments (EDs) analyze and synthesize the risk and protective factors in their efforts to formulate a global assessment of suicide risk. Finally, this program evaluation examined whether the designation *moderate risk* independently serves a useful and functional clinical purpose by accurately reflecting an ED provider's analysis of the risk and protective factors in suicidal veterans and by informing treatment.

Relevance.

This program evaluation sought to add to the knowledge base related to the assessment of suicide risk by providing a better understanding of how clinicians organize, operationalize, and, most importantly, translate their interpretations of empirically defined risk and protective factors into assessments of global risk and whether currently used methods are effective in preventing suicide.

Suicide statistics and epidemiology.

The suicide rate in the United States for the year 2010 (most current available statistics) was 12.4 per 100,000. The suicide rate was 20.0 per 100,000 for males and 5.2 per 100,000 for females (McIntosh & Drapeau, 2012). Suicide ranks as the 10th leading cause of death nationwide, outpacing homicide, which is ranked 16th. After poisoning, suicide is the second leading cause of death among 25- to 34-year-olds and the third leading cause of death among 15- to 24-year-olds. It is the 7th leading cause of death for

men and the 15th leading cause for women (Centers for Disease Control and Prevention, CDC, 2010). Although women attempt suicide about three times as often as men (Krug, Dahlberg, Mercy, Zwi, & Lozano, 2002), in 2010, there were 3.7 male deaths by suicide for each female suicide (McIntosh & Drapeau, 2012). Suicide rates are highest among those aged 75 and older (36.1 per 100,000) for males and aged 45 to 54 for females (8.8 per 100,000) (CDC, 2010). Caucasian males are overrepresented in suicide mortality data for 2010, with a rate of 21.6 per 100,000, followed by Native Americans/Alaska Natives, with a rate of 12.3 per 100,000 (CDC, 2010). The suicide rate within the African American population is 5.1 per 100,000, with males (8.7 per 100,000) dying by suicide at a much higher rate than females (1.8 per 100,000) (McIntosh & Drapeau, 2012). The suicide rate among Latinos is slightly higher than among the African American population, at 5.3 per 100,000. Deaths by suicide occur on an average of one person every 14.2 minutes.

It is estimated that 923,000 suicide attempts occur annually in the United States, representing 25 attempts for every suicide (Goldsmith, Pellmar, Kleinman, & Bunney, 2002). In 2008, 163,489 persons were hospitalized after suicide attempts; 376,306 were treated in emergency departments and released (CDC, 2010). Based on the 796,672 suicides from 1986 through 2010, it is estimated that the number of survivors of suicides in the U.S. is 4.78 million; that number grew by at least 230,184 to 1 in every 65 Americans in 2010 (McIntosh & Drapeau, 2012).

The most common methods of suicide in 2010 were firearms (50.5%), suffocation/hanging (24.7%), and poisoning (17.2%) (McIntosh & Drapeau, 2012). Firearms accounted for 19,392 suicides in 2010 and represent the most frequent method

to be employed by males (55.7%, CDC, 2010; McIntosh & Drapeau, 2012). Having a readily accessible handgun in the home greatly increases a psychiatric patient's risk for completing suicide, providing them with an all too effective and lethal means (Kellerman et al., 1992; Miller & Hemenway, 1999; Oslin et al., 2004). Medical autopsy findings from 16 states suggest that concurrent use of alcohol and other substances may play a mediating role in those who die by suicide using lethal means such as firearms (Karch, Logan, & Patel, 2008).

In the last three decades, epidemiological studies have played an instrumental role in identifying specific demographic and risk factors that are associated with suicide and suicidal behaviors. As the previously presented nationwide statistics suggest, suicide is a low base-rate behavior. As a specific example of this, Simon (2008a) points out that individuals who are diagnosed with bipolar disorder are estimated to have a suicide rate of 193 per 100,000, i.e., at 18 times greater risk than the general population. By logical inference, this leaves 99,807 individuals diagnosed with bipolar disorder who will *not* die by suicide. Analysis of information such as this should be valuable in providing opportunities to understand the possible causal relationships of those risk factors that contribute to suicide in the general population (Moscicki, 1997).

Epidemiological studies have relied on the use of psychological autopsy methods. Psychological autopsies are retrospective, population-based studies in which data that may explain causal factors for an individual's suicide are collected by performing structured interviews of family, relatives, friends, and medical providers. Additional information can be obtained from medical and psychiatric records, as well as coroner reports. Collectively, the data have the ability to support the causal hypotheses related to

suicide and generalize these to the population at large and to generate additional causal hypotheses that can be later tested in various research environments (Moscicki, 1997). The benefit of employing psychological autopsy methodology is that it uses data from unbiased population samples that are not restricted to specific clinical or service environments (Moscicki, 1997). The disadvantages of this approach include incomplete reporting, as might be found in coroner reports or medical records, and reliance on the testimony of individuals who were familiar with the decedent's history that may contain distortions and biases (Rivlin, Fazel, Marzano, & Hawton, 2012). In the absence of a suicide note, psychological autopsies do not provide comprehensive explanations of the decedent's underlying subjective experiences that may have contributed to suicide (Hawton et al., 2001).

An alternative method for obtaining epidemiological data for identifying and understanding the risk factors associated with suicidal behaviors utilizes a qualitative approach that involves interviewing survivors of near-fatal suicide attempts and is seen as a proxy for suicides (Cooper, Lawlor, Hiroeh, Kapur, & Appleby, 2003; Douglas et al., 2004). Several prison studies in the United Kingdom that compared near-lethal suicide attempts with suicides reveal the strong potential for obtaining the kind of qualitative data that is unable to be obtained from psychological autopsy studies. One major obstacle with this research strategy is the difficulty in recruiting participants who are willing to be interviewed, which may explain the paucity of these types of studies (Douglas et al., 2004).

Suicide within the veteran population.

Since the beginning of the United States' military campaigns in Iraq and Afghanistan, the well-publicized media reports concerning the alarming rates of suicide

among active duty service members and returning veterans have caused great concern to policymakers and the general public alike (Dao, 2012). With the exception of only one study (Blow et al., 2012), most retrospective studies of suicide based in the Veterans Administration (VA) have been limited to higher risk individuals (e.g., those being treated for depression) and those who actively use VA medical and mental health services (Ziven et al., 2007). Only 23%, 5.5 million of approximately 22.7 million veterans, annually use services within the Veterans Health Administration (VHA), limiting the generalizability of suicide mortality data to veterans who do not receive such services (Bruce, 2010; Desai, Dausey, & Rosenheck, 2005; McCarthy et al., 2009; Thompson et al., 2002). A number of studies focusing on the suicide rates of veterans obtaining VHA services have found that veterans are at significantly greater risk of dying by suicide than the general population (Brenner et al., 2011; Kaplan, 2007; McCarthy et al., 2009; Miller et al., 2009). Kaplan (2007) found that this figure could be as high as 2.3 times greater than the general population. The suicide rate among veterans who used VHA services in 2009 was 35.9 per 100,000 (38.3 among men and 12.8 among women) (Katz, Kemp, Blow, McCarthy, & Bossarte, 2013).

The VHA has made efforts to improve accuracy in obtaining veteran suicide mortality statistics by obtaining death records from individual U.S. states on suicide decedents who are identified as veterans (Kemp & Bossarte, 2012). The most current VHA data on veteran suicide decedents are compiled from data received by 21 participating states and cover calendar years 2000 through 2010. These data reflect that veterans comprised approximately 22.2% of the total number of suicides, suggesting that an estimated 22 veterans will have died by suicide on a daily basis if prevalence estimates

are assumed to be constant across all 50 states (Kemp & Bossarte, 2012). It is important to note that these figures are the best estimates to date, but are subject to reporting errors contained on death certificates.

Demographic data.

Analyses of the most recent data reflect that veterans, including those who did and did not receive VHA services, who died by suicide were significantly more likely to be male and ages 50 to 59 years (Kemp & Bossarte, 2012). The average age at time of death based on state death certificates was 59.6 years, whereas VHA records reflect an average of 54.5 years (Kemp & Bossarte, 2012). One of the main findings from these analyses is that more than 69% of the veterans who died by suicide were 50 years of age or older (Kemp & Bossarte, 2012). Males comprised approximately 97% of all veteran suicides, whereas female veterans accounted for less than 3% of that total (Kemp & Bossarte, 2012). Race and ethnicity figure prominently in veteran mortality statistics and reflect that those veterans who identified as non-Hispanic Whites comprised 92.6% of the total number, compared to 4.5% of African Americans. A higher level of comparative educational achievement was also found to be a prominent factor in veterans who committed suicide. Veteran decedents who were identified as high school graduates without any postsecondary education were overrepresented at 35.1%, whereas those who reported having less than 12 years of education comprised only 10% of the total (Kemp & Bossarte, 2012).

Nonfatal suicide events.

Since 2008, the VHA has utilized live surveillance to track events related to self-directed violence (SDV) occurring among veterans who are actively receiving services. The Suicide Prevention and Application Network (SPAN) is an internal data collection

system that is used primarily to capture information on the incidence and characteristics of fatal and nonfatal suicide attempts. SPAN data captured more than 16,000 nonfatal suicide attempts during fiscal year 2011; that number decreased to approximately 15,000 in fiscal year 2012 (Kemp & Bossarte, 2012). The SPAN data also reflects that female veterans engage in nonfatal, SDV at a greater frequency than their male counterparts; however, since FY2009, annual trends suggest that the gender gap may be closing (Kemp & Bossarte, 2012). SPAN data also reflects that the highest rates of nonfatal suicide events occur among younger veterans, whereas these rates appear to decrease consistently with increasing age. SPAN report data also reflects that the majority (80%) of the nonfatal events occur within 4 weeks of receiving services through the VHA. Some seasonal variations were also noted, with higher numbers of nonfatal events occurring during the spring and summer months in 2010 and 2011 (Kemp & Bossarte, 2012). As of September 2011, the overall rates of nonfatal suicide events appear to be trending downward.

Clinical judgment and decision-making theories.

The numerous theoretical explanations for the etiology of suicidal behavior speaks to the complexity associated with meeting the criteria to formulate a reasonable clinical judgment of risk. Suicidal individuals vary greatly in their respective symptomatology, histories, psychological vulnerabilities, and ability to cope with psychic pain when presenting in psychiatric crisis to hospital emergency departments. Accurately identifying these variations among suicidal patients becomes critical when determining who is and is not at risk for engaging in self-directed violent behaviors. It has been postulated that the majority of human errors in judgment and decision making (JDM) are based on deficits in skills, rules, and knowledge base (Reason, 2002; Vincent, 2002).

This results in the ED evaluator needing to engage in a deliberation process that involves collecting a very large amount of data directly from the patient, patient medical records, and collateral sources, all needing to be weighed and combined in order to be able to arrive at a reasonable judgment about the potential for SDV and make a decision about treatment (e.g., whether to hospitalize the patient). To arrive at a reasonable judgment and choice of alternative, the ED evaluator will have a number of internal and external resources from which to draw, including his or her own stored knowledge base, the expertise of others, and research evidence supporting known risk and protective factors (Thompson & Dowding, 2002).

Naturalistic decision making.

Chapman (2004) coined the term *surrogate decision making* to describe the process by which individual healthcare practitioners make decisions on behalf of their patients. A naturalistic decision making (NDM) paradigm takes into consideration that complex decision making is inherently limited by the bounded rationality imposed by human cognition. The process of determining an individual's risk for engaging in SDV that informs clinical decision making can be filled with uncertainty because it is often the case that some of the required information may be either unknown or ambiguous.

Further complicating this process is the fact that decisions are generally not made in isolation from fixed choices, but occur in a dynamic manner in which one decision and action is likely to influence another (Orasanu & Connelly, 1993). This is particularly the case when decision making is influenced by organizational goals and norms, competing interdisciplinary roles, and human factors (e.g., time pressures, personal stress, and emotionally laden outcomes for the participants). Decision making has been found to be most difficult when: (a) information and guidelines needed to facilitate the interpretation

of multiple data and to guide a course of action are unclear or limited, (b) the decision being made has a strong potential for negative consequences or outcomes, and contains challenging emotional or ethical dimensions, (c) high levels of qualitative dissimilarity exist in the types of decisions being made, (d) conditions are frequently changing, (e) there is a large amount of data that requires interpretation in order to make a decision, and (f) there is poor quality data, which makes it difficult to distinguish between material that is relevant and irrelevant to the decision making task at hand (Lewis, 1997; May, 1996; Schön, 1988; Smith, 2006; Whitney, 2003). The NDM model assumes that a decision is influenced by the individual practitioner's perceptions of the situation and individual experiences (Zsombok & Klein, 1997). The NDM model is better suited to environments that are chaotic and operating with uncertain conditions and limited information.

Descriptive theory.

Descriptive theories of JDM, which are also naturalistic, are informed by the behavioral sciences and seek to understand how individuals make decisions and judgments by focusing on the individual effects of learning, cognition, context, interactions, and ecology in order to determine consistencies in rational decision making (Bell, Raiffa, & Tversky, 1988; Thompson & Dowding, 2002). One influential and commonly used descriptive model, information processing theory (IPT), is based on the premise that cognition is limited and rationally bounded by the storage capacity of human memory (Newell & Simon, 1972). IPT also makes the assumption that practitioners rely on their interactions with their decision making (Elstein, Shulman, & Spravka, 1978; Hamers, Abu-Saad, & Halfens, 1994; Tanner, Benner, Chelsea, & Gordon, 1987). Descriptive models are particularly relevant to suicide risk assessment because the

limitations inherent in human cognition can increase the likelihood for making potentially fatal flaws in decision making. The use of heuristics, or mental shortcuts, can make decision making easier in uncertain situations or when there is limited information; however, practitioner reliance on these reasoning strategies can and does increase the possibility of arriving at biased and erroneous conclusions (Thompson & Dowding, 2002). A number of studies suggest that the specific reasoning approaches used by practitioners and the speed of their decision making are contingent on the simplicity or difficulty of the decision attributes at hand (Corcoran, 1986; Eraut, 2004; Fish & Coles, 1998; Hamm, 1988; Payne, Bettman, & Johnson, 1992). It is suggested that when time pressures bear too heavily on the process, more rapid responses and less analytical approaches will be used (Eraut, 2004).

Normative theory.

In contrast to descriptive theories that focus on how “ordinary” individuals make decisions without regard to the quality of the outcome of those decisions, normative theories of JDM, which are positivist in nature, seek to discover how “rational” people make decisions. This is based on the assumption that rational people are defined as those whose decision making is based on empirical evidence (Bell et al., 1988). Accordingly, normative models rely on the use of statistics and probabilities in evaluating optimal conditions and environments to determine how to achieve good judgments and outcomes (Thompson & Dowding, 2002). The most frequently used normative approaches in healthcare settings for arriving at optimal decision making are the expected utility theory (EU) and the subjective expected utility theory (SEU). EU is the product of the probability of an outcome and the level of value that the decision maker and the benefactor of that decision place on that outcome. The use of decision trees aid in

decision making by making these processes explicit. This is done by dividing problems into smaller decisions which are then assigned a numerical value that represents the probability of the event associated with the smaller component (Dowie, 1993). Being able to evaluate the probabilities associated with each small component of the overall problem, allows for the calculation and identification of the option with the highest EU (Thompson & Dowding, 2002). SEU is unique in that it uses mathematical models to control for decision makers' values or beliefs within a "rational" context, allowing for a number of probable outcomes to be calculated before selecting the optimal decision for the individual (Chapman & Sonnenberg, 2000). Normative approaches to JDM are fundamental to the task of suicide risk assessment because they require a comprehensive risk analysis involving the explication and weighting of all possible risks in order to determine how judgments are made. The use of Baye's Theorem for Judgments (Hastie & Dawes 2001), which attempts to mathematically calculate conditional probabilities, is a commonly used normative approach for arriving at decisions based on probabilistic outcomes. It seeks to redress the uncertainty and stress in judgment and decision making that is associated in the high stakes circumstances previously mentioned (Hammond, 1996, 2000). For instance, the probability of an individual having a particular medical diagnosis can be calculated given the available epidemiological data and the information provided by test results. The use of actuarial instruments and scales, such as those developed for suicide risk assessment, attempts to quantify risk in order that all potential risks can be explicated. Normative theories rely on quantification of risk in complete and known ways, and this may not be entirely possible in medicine and healthcare (Hammond, 1996, 2000). As in the case of suicide risk assessment, attempts to quantify

risk in this manner lead to validity for only one specific point in time, most often with significant biases.

Prescriptive theory.

Prescriptive theories were developed as a reaction to the inherent dichotomy imposed by both descriptive and normative models. Prescriptive models serve to help practitioners make better decisions by using such tools as clinical guidelines and practices that aim to standardize and to improve the quality of patient care (Thompson & Dowding, 2002). These protocols serve as mechanisms to reduce variations in clinical care and discourage providers from practicing in ways that are not evidence based (Thompson & Dowding, 2002). Studies suggest that although prescriptive methods have been demonstrated to improve quality of care, their effects are inconsistent and variable, and information about their routine application is not clear (Grimshaw & Russell, 1993; Thomas, McColl, Cullum, Rousseau, & Soutter, 1999). Known problems associated with the use of clinical guidelines include creating the illusion of a single, correct answer for a complex problem and being based on information that is not representative of the most recent empirical research (Berg, 1997; Matchar & Samsa, 2003; Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 2000). The second problem can easily lead to erroneous judgments that would not have been made had the guideline been updated to reflect more suitable options.

Social judgment theory.

Accuracy of judgment is defined as being free from error, being correct, and deviating only slightly from a standard (Hastie & Rasinski, 1988). It is suggested that the analysis for such accuracy of judgment requires: (a) the judgment, response or assertion under consideration, (b) the standard or criterion of truth, and (c) the rule specifying the

correspondence relation between the judgment and the criterion. Cooksey (1996) argues that the accuracy of an individual's judgment is predicated on: (a) how predictable the world is, (b) how knowledgeable the decision makers are, and (c) how consistently the decision maker applies that knowledge. Social judgment theory (SJT) provides a mechanism that measures the accuracy of judgment by comparing its process and quality by uniting all of these assumptions. SJT assumes that a practitioner's judgment criterion is based on the relationship between the informational cues and the outcomes of interest and their relatedness to the reality of the practitioner's respective social environment, represented by a series of lenses (Dowding & Thompson, 2003). SJT suggests that the ecological situation (e.g., the problem) is on the left side of the model. Information (cues) are represented by probabilistic values that are related to this ecological situation (e.g., suicide risk factors), each carrying a different level of importance, or weight. By utilizing the lens model, the practitioner will use these cues through his or her own cognitive lens in making a judgment (the right side of the model). Accuracy of judgment is greater in those situations in which practitioners weigh the information cues as they are linked to the ecological situation. If the informational cues are weighted differently, then their judgment will not reflect the ecological situation and will be less accurate.

Regression analysis techniques are used to derive statistical equations or algorithms. The data analysis will reveal how much weight is attached to each item of information related to the ecological situation or used in the judgment (Cooksey, 1996).

Intuition.

Clinical practitioners are often heard to remark about their use of intuition to solve diagnostic challenges. Intuition has been described as a way of knowing or understanding something without the application of conscious reasoning or rationale or

having an immediate possession of knowledge related to fact or truth that is not derived through normal linear reasoning processes (Benner & Tanner, 1987; Rew & Barrow, 1987; Schrader & Fischer, 1987). Benner (1984) argues that the ability to make decisions intuitively is the criterion that distinguishes experts from novices, thereby freeing expert practitioners from their normal reliance on analytic reasoning principles on which to base their understanding of a situation to choose a reasonable action. A notable strength attributed to those who use intuition is the ability to quickly recognize and assess the possible outcomes of a given situation. This is particularly useful in decision-making contexts in which there is higher risk and uncertainty (Thompson & Dowding, 2002). Conversely, the use of clinical intuition has been criticized for its narrow limitations and utility in specialized applications only, with the claim that it cannot be generalized to other clinical contexts beyond those for which it was developed (Crow, Chase, & Lamond, 1995; Dowding & Thompson, 2003). Another criticism that is leveled at the use of clinical intuition is that it disregards the positive paradigms in which much of medicine and healthcare is grounded.

Expert-Novice theory.

Efforts to develop artificial intelligence in the late 1960s led to the development of the notion of expertise as a theory for JDM. In characterizing the expert-novice dichotomy, Chi and colleagues (1988) defined the expert as an individual who specializes and excels in the domain(s) in which he or she possesses voluminous and meaningful patterns of knowledge and experience. Experts are often described as being much faster than novices when performing tasks in their specialized domains and are able to solve problems with apparent accuracy and ease. As a result, experts are often credited with having superior short- and long-term memory. Problem representation in the specific,

specialized domains is conceptualized at deeper levels by experts than novices; the latter tend to provide more superficial representations. Metacognition, which is deemed to be essential to maintaining high quality human performance, is seen to be highly developed in experts (Alexander & Judy, 1988).

Cognitive continuum theory.

A number of researchers have suggested that most approaches to clinical reasoning are based on a continuum of cognition with intuition and analytics at polar ends and modes of cognition occurring in between that utilize a combination of both approaches (Hamm, 1988; Hammond, 1996). As it aims to assist individuals in improving their decision making capabilities, cognitive continuum is also described as a prescriptive model. Factors that inform which cognitive mode is in use at any time are the structure of the task, the number of relevant variables, and the amount of time that is available for making the judgment or decision. Analytical approaches are better suited to tasks that are well structured, capable of being separated into smaller decisions, and present comprehensive and complete information. Conversely, intuition is better suited to tasks that are poorly structured, high in uncertainty, and have multiple relevant variables available and when there is little time available to analyze the problem. Because most JDM in medical settings is somewhere between the two extremes, it has been recommended that professional judgment grounded in clinical experience is preferable to intuition (Paterson & Higgs, 2001).

Theoretical assumptions of this program evaluation.

The manner of clinical reasoning and decision making conducted by mental health professionals in the ED at the VA medical center where this program evaluation was conducted fits within the naturalistic or NDM paradigm. ED mental health

professionals are confronted with a number of challenges that make the complexities of assessing the risk potential associated with SDV extremely difficult. Although these providers are assumed to possess the training and clinical experience that qualifies them to be considered experts in the assessment of suicide risk, they are nevertheless in the unenviable position of reviewing voluminous amounts of historical data that are often ambiguous or cannot be validated because it is often difficult if not generally possible to obtain collateral history from veterans' families or support networks. In the case of many veterans who present to the ED endorsing suicidal ideation, mental health professionals need to decide whether the individual may be behaving in a manner for purposes of obtaining secondary gains. The addition of severe time constraints and personal work-related emotional stress within this particular ED makes the use of analytics and other prescriptive measures that might provide a more standardized, actuarial approach to suicide risk assessment impractical. As previously suggested, the NDM model takes into account that although far from precise, decision making will be mainly influenced by the individual practitioner's direct perceptions of the situation that inform judgment grounded in clinical experience.

Suicide risk assessment.

Suicide risk assessment incorporates similar strategies to that of risk management, which serve to identify and study hazards that increase the probability of an adverse outcome (Bouch & Marshall, 2005). A risk management approach makes sense, considering that the statistical rarity of suicide makes its prediction impossible (Pokorny, 1983). Determining whether an individual may be at risk of dying by suicide is a complex process and requires clinicians to obtain specialized knowledge of the risk factors that are known to mediate suicidal behaviors and of the protective factors that

buffer those risks (American Association of Suicidology, 2010). The complexity of suicide risk assessment is further compounded by the fact that both risk and protective factors can vary with age and gender, occur in combination, and can change over time. Clinicians will also find it necessary to learn and develop the interpersonal communications skills that lead to the development of a positive therapeutic relationship with suicidal individuals if they are to be effective in accurately eliciting information on those risk and protective factors (American Association of Suicidology, 2010; Shea, 2004).

The primary purpose for conducting a suicide risk assessment is to prevent a suicidal individual from imminently acting out his or her desires to die and to inform treatment that is designed to prevent suicidal behaviors. This is generally accomplished by identifying the intrinsic and extrinsic risk factors, also known as distal and proximal factors, that drive the suicidal sequelae. This process begins when the clinician evaluates a suicidal patient's current and past psychiatric diagnoses, paying particular attention to comorbid conditions, history of suicidal thinking and subsequent actions, family history of suicide attempts and mental illness, the patient's personal strengths and vulnerabilities, acute and chronic life stressors, and current complaints, symptoms, and mental state (Jacobs & Brewer, 2006). When those risk factors that are amenable to modification are identified, clinicians can begin to provide treatment interventions strategically designed to minimize emotional and behavioral effects, thereby reducing the patient's overall suicide risk. Certain risk factors, such as personal and family history and demographic characteristics, are important in developing a risk assessment, but these are immutable.

Other situational risk factors, such as marital distress and unemployment, are also unlikely to change in the short term.

Once assessment has identified the relevant suicide risk factors, emphasis is placed on those deemed to be modifiable by medical and psychological treatment, including psychiatric diagnoses, particularly mood disorders, psychotic disorders, substance use disorders and personality disorders, as well as symptoms such as anxiety, insomnia, hopelessness, and agitation (Jacobs & Brewer, 2006). In cases in which the acuteness of suicidal symptoms is very high and not likely to respond to immediate treatment, it may become necessary to hospitalize that individual in a locked unit with close observation by nursing staff to ensure ongoing safety. The identification of an individual's strengths and positive resources can provide an avenue of opportunity to engage protective factors as a means to mitigate suicide risk factors. In many cases, protective factors, such as being able to identify personally meaningful reasons for not wanting to die or having a desire to live, as well as strengthening an existing social support network, can significantly reduce an individual's global risk for suicidal behavior (Dervic et al., 2004; Gangwisch, 2010; Linehan, Goodstein, Nielsen, & Chiles, 1983).

Challenges associated with suicide risk assessment.

Originally, suicide risk assessment was informed by forensic psychiatric practices that focused on the prediction of potentially violent and dangerous behaviors (Dolan & Doyle, 2000). A number of studies have demonstrated that a completely accurate prediction of suicide is not feasible at this time (Allquander & Fisher, 1990; Coccoza & Steadman, 1976; Pokorny, 1983; Thornberry & Jacoby, 1979; Webster & Bailes, 2004). Therefore, precise prediction of who will and who will not go on to attempt suicide is currently not possible. Two primary factors contribute to this problem, the low incidence

or base rate of suicidal behaviors and the fact that suicide risk is highly variable, dynamic, and dependent on static as well as environmental factors (American Psychiatric Association [APA], 2003; Rudd et al., 2006). It is simply not possible to know when an individual who has long-term risk factors that lead him or her to be vulnerable to suicide is going to be faced with situational stressors that will activate those distal factors.

History has shown that the use of statistical approaches to the prediction of suicidal behavior may lead to iatrogenic consequences, resulting in individuals being assessed as at high risk for completing suicide when they are not (false positives) and, most tragically, failing to recognize someone who is at high risk for acting on suicidal desires (false negatives) (Fowler, 2012; Simon, 2002). Distal risk factors, which are underlying vulnerabilities such as psychiatric diagnoses, demographics, and patients' self-reports of their subjective psychological state, have limited predictive value because they are generally known to yield a high rate of false positives (Goldsmith et al., 2002; Oquendo, Halberstam, & Mann, 2003; Rudd et al., 2006). The assessment of suicide risk is further complicated by the complexity and lack of understanding about how individual risk factors interact with one another to influence outcomes.

As a result of the poor outcomes that are obtained by attempting to predict self-harm behaviors, the main emphasis and goal of suicide risk assessment has now switched from prediction to prevention by systematically evaluating the risk and protective factors with which suicidal individuals present (Bouch & Marshall, 2005). Once all of the relevant risk and protective factors are identified, mental health professionals are tasked with applying their clinical judgment to distinguish those individuals who are imminently at risk to engage in SDV from those who are not by applying a categorical risk rating.

Global risk ratings allow mental health professionals to stratify risk by assigning suicidal individuals on a continuum ranging from highest to lowest risk for engaging in near-term SDV. The absence of an empirically based operational definition of moderate or intermediate risk creates difficulty in attempting to understand whether this category of risk serves any clinically meaningful purpose that can inform suicide prevention efforts. By logical inference, the existence of an empirically based construct known as moderate risk could add precision to the suicide risk assessment process by identifying a population of suicidal ideators who can be defined by the presence or absence of certain risk and/or protective factors. As indicated previously, there is currently no empirical basis for using this categorical risk stratification, thereby prompting the current program evaluation.

Methods of suicide risk assessment.

The three primary approaches used by clinicians to assess suicide risk are clinical interview, actuarial, and structured clinical judgment (Bouch & Marshall, 2005). Of the three approaches, the clinical interview is the most commonly employed method in general clinical practice. The clinical interview is also the primary method used by emergency department (ED) mental health professionals at the VA medical center where the current program evaluation was conducted. Most clinicians appear to prefer to interview and observe their patients directly when obtaining the information that is to form the basis for their judgments of suicide risk (Jobes, Eyman, & Yufit, 1995; Mays, 2004). Suicide risk assessment interviews are generally comprised of assessor-valued questions that are intended to elicit patient responses to inform an estimate of the probability that an individual in significant emotional crisis intends to imminently engage in self-injury behaviors. Although not considered good clinical practice, questions may be as simple as asking individuals close-ended questions about whether they are

endorsing suicidal thoughts (Sullivan & Bongar, 2012). Alternatively, clinicians may guide the interview and direct questions to patients by following a checklist or prepared form. This method is precarious in that hurried and anxious clinicians may eventually place their confidence in the questions instead of conducting a rigorous and thorough suicide risk assessment, thereby failing to identify risk and protective factors that are unique to the individual (Simon, 2009).

Actuarial methods were introduced as a reaction to concerns about what was seen to be the inherent unreliability in the use of clinical judgment (Bouch & Marshall, 2005). These mathematically based methods incorporate the use of standardized interviewer-administered and self-report instruments with psychometric properties specifically designed to detect suicidal ideation, intent, and behaviors. It is important to note that the predictive validity of most such instruments cannot be properly established, given the low base rate of suicides (Brown, 2000). Two of the most widely used instruments, the Scale for Suicidal Ideation (SSI, Beck, Kovacs, & Weissman, 1979), and the Beck Hopelessness Scale (BHS, Beck & Steer, 1988), both of which have had been demonstrated to have positive correlations with death by suicide, were empirically found to be more sensitive in predicting suicides, but tended to fall short in specificity, or being able to predict who will not go on to complete a suicide (Brown, 2000). The SSI was subsequently replaced by the Beck Scale for Suicidal Ideation (BSS), developed to measure suicide risk based on patients' thoughts and wishes about suicide, and remains the best predictor of hospital admissions (Beck & Steer, 1991; Cochrane-Brink, Lofchy, & Sakinofsky, 2000). It is recommended that the use of such instruments augment but not replace a clinician's systematic suicide risk assessment because no single suicide risk

assessment measure or clinician assessment has been shown to be able to predict suicide (Simon, 2006b; 2009). Actuarial methods by their very nature have great statistical power when they are applied to groups of people, but fail to predict outcomes when applied to individuals, as in the clinical setting (Mays, 2004).

The structured professional judgment approach is a hybrid model that combines the best of both the individual clinical interview and actuarial approach as a means of adding more precision to the risk assessment process (Mays, 2004). In the broadest sense, it is a data gathering approach whereby clinicians make reference to the evidence base for risk and protective factors as well as contextual, historical, and demographic factors that inform individual patient assessment. Analysis of such data, when applied to an individual's clinical presentation, interpersonal and situational stressors, and the statistical properties represented by each of the empirically based risk factors, can increase overall precision and clinician confidence in the assessment of the patient. This systematized approach to risk assessment also serves as a sufficient protocol that meets the reasonable standard of care criteria in most states when legal cases involving suicides are brought to court (Simon, 2002; 2006a). Approaching suicide risk assessment in this systematic manner ultimately allows the assessor to weigh all of the collected data, determine the level of risk on a continuum from low to high risk, and plan treatment and management of the patient (Bouch & Marshall, 2005). Given that no available test can reliably predict any one person's risk for suicide, the application of clinical judgment, informed by empirical research and professional experience, will continue to guide risk assessment (Simon, 2012).

A number of suicide risk assessment methodologies that utilize structured and systematized approaches to suicide risk assessment are available to the clinician. Some of the available instruments are specifically designed to assess the risk of or propensity for suicidal behaviors (e.g., Beck, Brown, & Steer, 1999; Beck & Steer, 1988; Cull & Gill, 1988; Linehan et al., 1983), and others are designed to assess the intent and lethality of suicidal behaviors (Beck, Schuyler, & Herman, 1974; Berman, Sheppard, & Silverman, 2003; Pierce, 1981; Weissman & Worden, 1972). Although these methods provide a much more rigorous and thorough risk assessment, it is important to note that no single model of risk assessment has been empirically tested for validity or reliability (Busch, Clark, Fawcett, & Kravitz, 1993; Simon, 1998). The absence of such research raises the question of whether the use of the clinical interview alone can adequately elicit sufficient data to be able to inform mental health professionals with an accurate overall picture of an individual's imminent or future potential to act on suicidal thoughts.

The clinical interview is the primary method being used by ED mental health professionals at the VA medical center where this program evaluation was conducted. This is not to suggest that VA leadership has not had an interest in using quantitative methods as augmentation to the clinical interview as a means to assess the level of suicide risk in veterans (Haney et al., 2012). Previous research findings concluded that further prospective research was needed to establish the effectiveness of assessment instruments in predicting suicidal behaviors, (Gaynes et al., 2004; Mann et al., 2005; & National Institute for Health and Clinical Excellence, 2011). The VA assessed five research studies, two of which evaluated instruments currently in use in VA settings: the Personality Assessment Inventory (PAI, Breshears, Brenner, Harwood, & Gutierrez,

2010), and the Beck Depression Inventory–II (BDI–II) (Beck, Steer, & Brown, 1996; Hartl, Rosen, Drescher, Lee, & Gusman, 2005). The remaining three studies evaluated instruments not commonly used in VA settings: the Interpersonal Psychological Survey (IPS, Nademin et al., 2008), the Addiction Severity Index (ASI, Tiet et al., 2006), and the Affective States Questionnaire (ASQ, Hendin, Al Jurdi, Houck, Hughes, & Turner, 2010). Three of the studies had methodological flaws that resulted in assessments of a high risk of bias (Breshears et al., 2010; Hartl et al., 2005; & Nademin et al., 2008). The remaining two studies had an unclear risk of bias (Hendin et al., 2010; Tiet et al., 2006). It is also noteworthy that there are no identified studies available on instruments that have the ability to reclassify veterans from a low-risk to a high-risk status. These studies, which possessed low statistical power, suggest that the limited evidence does not currently support screening with any of these instruments. Factors were short follow-up periods, inadequate sample sizes required to detect effects on low base-rate outcome, and high rates of false positives (Haney et al., 2012). Both the PAI and the ASI would likely be impractical for use in an ED setting, considering the lengthy time needed for administration, scoring, and interpretation. Clearly, more research is warranted to find an instrument that is not only practical in an ED setting, but also eliminates the historical problems associated with inability to consistently detect individuals who are not at risk of engaging in suicidal behaviors.

Applying a ratings system approach is a way that allows clinicians to operationalize the level of suicide risk that is represented by their analysis and synthesis of all of the data obtained during the suicide risk assessment. Commonly, an individual's risk for suicide is rated on a continuum ranging from low to high. Assigning such a risk

rating to suicidal patients is a universal practice among mental health practitioners, and serves a triaging function that informs treatment recommendations that are ultimately intended to manage current and future risk of suicidal behaviors (Simon, 2012). Current VA clinical practice guidelines attempt to operationalize risk levels for suicidal patients in the following manner:

Patients at High and Acute Risk include those with current intense and persistent suicidal ideation, OR strong direct or indirect evidence of intent to die, OR recent attempt or preparatory behaviors;

Patients at Moderate Risk include those with chronic, intermittent, or resistible suicidal ideation AND/OR some direct or indirect evidence of intent to die but with NO recent attempt or behavior indicating preparation

Patients at Low or Chronic Risk may include those with fleeting or passive suicidal ideation, or thoughts of death only, and absence of direct or indirect evidence of intent to die or recent attempt or preparatory behavior. (Kemp, Katz, Bradley, & Schneider, 2012)

In most cases, suicidal individuals who are rated at low to moderate risk are professionally judged as lacking the intent to act on suicidal thoughts, either imminently or in the near future, and are generally referred for outpatient mental health services.

This standard approach to rating suicide risk is a protocol that is also followed at all of the VHA facilities that provide services to veterans. It has also been suggested that the overwhelming majority of suicidal individuals who present to emergency department settings are rated at moderate risk (Ravindranath & Deneke, 2012). Given the relative importance of reaching an accurate, empirically informed judgment regarding the current

level of suicide risk and future treatment recommendations, it would seem that knowing what risk and protective factors constitute moderate could add precision to the task of identifying individuals who may be at long-term risk for suicide and inform specific outpatient treatment protocols that could mitigate the long-term distal risk factors in those whose histories subject them to being chronically vulnerable.

Research on suicide risk categories.

Previous research has demonstrated a number of inaccuracies and inconsistencies in the process by which physicians document suicide risk assessments in emergency departments (Dennis, Beach, Evans, Winston, & Friedman, 1997; Black & Creed, 1988; Hurry & Storey, 2000; O'Dwyer, D'Alton, & Pearce, 1991). Additionally, patient management does not always reflect a physician's evaluation of suicide, leading to large variations in final treatment recommendations (Dennis et al., 1997; Hawton, 1995; Hurry & Storey, 2000; Kapur et al., 1997). A search of the literature identified only one known study, conducted in the United Kingdom, that specifically evaluated emergency department physicians' ability to assess patient factors in applying suicide risk ratings to individuals who had recently engaged in non-lethal suicide attempts (Cooper, Lawlor, Hiroeh, Kapur, & Appleby, 2003). This study was limited to identifying individuals at low and high risk only for purposes of determining the appropriateness of level of care and referral to specialty behavioral health clinics and/or medical surgical units. This study found that male gender, being over 35 years of age, patient endorsement of a suicide plan, appetite disturbance, appearing depressed, having access to a high lethality method, attempts to avoid discovery, premeditation, and patient verbalizing wishes to die were the most important independent predictors of how physicians rated high suicide risk. Being referred to psychiatric services directly from the emergency department or to

surgical/medical services was also strongly associated with a perceived high risk. The current program evaluation explored whether mental health professionals' categorical ratings of suicide risk accurately identify those individuals who are most and least likely to engage in future SDV.

Clinician and patient issues in suicide risk assessment.

A systematic suicide risk assessment is only as useful as the credibility and validity of the information provided by the patient and a clinician's ability to interpret the obtained data in as bias-free a manner as possible (Shea, 2004). A suicidal patient may have any number of reasons to withhold or misrepresent a number of important variables concerning suicidal ideation and intent to carry out a suicide attempt (Shea, 2004; Simon, 2008b). Studies suggest that over 25% of suicidal patients do not report ideations to their medical and mental health service providers (Busch, Fawcett, & Jacobs, 2003; Isometsä et al., 1995; Robins, 1981). An individual who fears stigmatization or hospitalization or is very determined to die by suicide is quite unlikely to disclose his or her intentions to a mental health provider, who at that point may be perceived as the enemy because he or she has the power to thwart an attempt (Resnick, 2002; Shea, 2004; Simon, 2008b).

Another challenge confronting emergency department mental health clinicians and attending psychiatrists in acute inpatient settings is the possibility that an individual may be motivated to exaggerate psychiatric symptoms for purposes of secondary gain. ED mental health professionals practicing at VA medical centers often report this as a possibility when documenting a suicide risk assessment. This is particularly true in those situations in which a veteran may be seeking hospitalization to avoid facing imminent legal consequences or residing in a homeless shelter. The term that is often used at the

VA medical center where the current program evaluation was being conducted is “hiding out.”

Studies suggest that as many as 10% of patients who report suicidal ideation and planning may actually be feigning these symptoms (Rissemiller, Steer, Friedman, & DeMercurio, 1999). In many cases, mental health professionals have difficulty assessing malingering in these patients (Rissemiller et al., 1998; Wang et al., 1997). One Australian study using prison inmates as participants demonstrated that many individuals who malingering may actually be experiencing concurrent suicidal ideation (Dear, Thompson, & Hill, 2000). Psychological testing may be helpful, but it is unlikely to be used in the context of an emergency department and has potential liability associated with false negatives. Additionally, hospitals are unable to be reimbursed for a *DSM-IV-TR* diagnosis of malingering. When confronted with a malingering patient, emergency department psychiatrists may take an overly cautious approach that typically leads to a hospital admission and unnecessary hospitalizations (Joiner, Rudd, & Rajab, 1999; Rissemiller et al., 1994).

Dealing with suicide is an occupational hazard for the mental health professional. Simon (2002, p. 340) states, “There are two kinds of clinical psychiatrists: those who have had patient suicides, and those who will have patient suicides.” The only way a clinician can avoid this possibility is to choose to not treat suicidal patients (Simon, 2006b). Losing a patient to suicide can create powerful and painful emotions for clinicians similar to those experienced by other survivors (Maltsberger & Buie, 1974). Shock, grief, guilt, fear of blame, self-doubt, shame, anger, and betrayal are the emotions most commonly expressed (Hendin et al., 2000). In addition, clinicians who experience

the suicidal death of a patient are also prone to experience significant decreases in their feelings of confidence and may begin to question their own professional competency and create excessive anxiety impeding both judgment and inability to recognize a true suicidal crisis (Hendin, Maltzberger, Lipschitz, Haas, & Kyle, 2001; Simon & Gutheil, 2004). Furthermore, fear of survivor lawsuits can cause clinicians to practice in a defensive and overly cautious manner that may result in assessing an individual to be at higher risk than may actually be the case. Practicing in such a defensive manner potentially violates an individual's civil liberties and threatens to undermine and rupture the therapeutic relationship. The therapeutic relationship, as previously discussed, is known to serve as an important protective factor for the suicidal patient.

In addition to anxiety, countertransference has been implicated as a clinician factor, which is known to be a contributory factor in increasing the risk of patient suicide (Maltzberger & Buie, 1974). Clinician feelings of hatred toward an actively suicidal patient are quite common because a death by suicide can be perceived as an indicator of the clinician's incompetence. Another countertransference issue that may cloud a clinician's judgment occurs when a rescuer role is assumed and the clinician assumes overall responsibility for the patient's life (Simon & Gutheil, 2004). Some clinicians may interact with suicidal patients in a manner that prevents them from truly acknowledging any hostile feelings toward a patient (Gabbard & Lester, 1995). Failure to acknowledge the role that countertransference may play in working with suicidal patients may indirectly increase the risk for faulty suicide risk assessments and iatrogenic harm.

Risk factors for suicide.

Clinicians have an ethical responsibility and legal obligation to assess their patients for the risk of SDV (Simon, 2012). Although a review of the suicidology literature suggests that there are over 75 different factors and warning signs associated with suicide risk (Wingate, Joiner, Walker, Rudd, & Jobes, 2004), it is impractical as well as unreasonable to expect rank and file clinicians to have direct access to all of these at any given point in time. For purposes of practicality and conceptual efficiency, greater attention to and understanding of the potential acute, proximal warning signs and long-term risk factors that are empirically associated with suicide will yield better assessment of an individual's intent to engage in suicidal behaviors (Fowler, 2012; Simon, 2012). In the case of suicide risk assessment, the term *acute* refers to the severity and magnitude of the psychiatric symptoms that patients report during an assessment. Greater emphasis is placed on those symptoms that patients subjectively experience as causing the most psychological distress due to their intensity and prolonged duration.

High-risk suicide factors are generally assessed and divided among the following categories: historical, personal, clinical, and psychosocial-environmental. Historical, personal, and some clinical factors are considered static and immutable. These factors include a history of multiple suicide attempts, comorbid psychiatric disorders, single diagnoses, history and severity of mental illness, personality disorders/traits, family history of suicide, childhood adversity, certain genetic markers, and demographic factors such as age, gender, race, sexual orientation, and marital status (Fowler, 2012). Those risk factors that comprise the psychosocial-environmental domain are considered to be proximal variables, implying that recent environmental events can mediate the severity and magnitude of an individual's underlying static or distal risk factors. From a suicide

risk assessment point of view, having knowledge of the proximal events that have activated a suicidal crisis in an individual can be useful in mediating risks if alternative concrete resources such as social supports, housing, and financial assistance can be identified and brought to bear, provided that the patient is amenable to accepting them and perceives them as mitigating or protective.

Although distal risk factors that are associated with high risk suicidal behaviors have a very strong evidence base to support them, it is also important to note that there is currently no single risk factor that is predictive of future suicide (Meltzer, Conely, & De Leo, 2003). Currently, the best known predictor of a suicide attempt is a history of suicide attempts (Fawcett, 2001; Hirschfeld & Russell, 1997; Joiner, Brown, & Wingate, 2005; Mann, 2002; Sher, Oquendo, & Mann, 2001). Harris and Barraclough (1997) suggest that individuals who have a history of suicide attempt are 38 times more likely to die by suicide than those who have never attempted. Retrospective and psychological autopsy studies have also shown that more than 90% of those individuals who go on to complete suicide have a diagnosable psychiatric disorder (Hirschfeld & Russell, 1997; Mann, 2002, 2003; Moscicki, 1999; Sher et al., 2001). A 5-year follow up study demonstrated that potentially lethal suicide attempts that require individuals to receive emergency medical services carry a 48-fold greater risk for future suicide over the general population (Beautrais, 2004).

The mere fact that an individual has a psychiatric disorder automatically places him or her at a higher risk for suicide than those individuals who do not have a disorder, although the vast majority of individuals who have a diagnosable psychiatric disorder do not go on to attempt or die by suicide (Harris & Barraclough, 1997). The Suicide

Mortality Ratio (SMR) is defined as a ratio of the observed number of deaths in a study population to the number of deaths that would be expected, based on demographically specific rates in the general population and the demographic distribution of the study population. It is used to compare the rates of suicidal deaths between a study population of interest and the general population. In the general population, the highest SMRs occur among individuals who are diagnosed with an eating disorder or substance abuse disorder, whereas moderately high rates are found among individuals diagnosed with mood and personality disorders, with lower rates existing among those who have anxiety disorders (Harris and Barraclough, 1997). Eating disorders, especially anorexia nervosa, carries a 40-fold higher risk for suicide over the general population (Preti, Rocchi, Sisti, Camboni, & Miotto, 2011).

Mood disorders.

Mood disorders, particularly unipolar and bipolar depression, are the most common type of psychiatric illness associated with suicides in developed countries, although they by themselves do not predict suicide attempts (Harris & Barraclough, 1997; Nock et al., 2009). The SMR of individuals who are diagnosed with bipolar disorder (Type I) is 22 times higher than that of the general population (Harris & Barraclough, 1997; Tondo, Isacsson, & Baldessarini, 2003). This is followed by individuals with severe major depression (SMR = 20). Additional studies suggest that the history of at least one prior episode of severe major depression is highly associated with later suicidal behavior (Dilsaver et al., 1997; Tondo et al., 1998). These rates are compared with individuals with moderate levels of major depression, whose SMR would range between 5 and 9 (Baldessarini et al., 2012; O'Leary, Paykel, Todd, & Vardulaki, 2001; Tondo et al., 2003). Individuals diagnosed with Type I or Type II bipolar disorder

are more likely to make a serious suicide attempt or die by suicide when they are in the depressed or mixed phase of the illness, less likely when in a manic phase, and very unlikely in a hypomanic phase (Tondo et al., 1998). A mixed-phase episode of bipolar disorder was shown to carry the highest risk of suicide risk within this diagnostic category. This increased risk during the mixed phase likely stems from the increased energy of the manic component of the episode, in combination with severe dysphoria of depression (Baldessarini et al., 2012; Marneros, Röttig, Wenzel, Blöink, & Brieger 2004; Valtonen et al., 2005). It is also important to note that suicide risk is highest in the earliest stages of bipolar disorder (Goodwin & Jamison, 2007; Osby, Brandt, Correia., Ekblom, & Sparén, 2001).

Substance use disorders.

The abuse of substances does not necessarily convey a greater risk for suicide, but the social, medical, legal, and occupational consequences of abuse create more severe proximal risk factors that become the targets of clinical interventions (Darke et al., 2007; Wenzel, Brown, & Beck, 2008). When viewed from the diathesis-stress model, substance abuse itself would be considered a distal risk factor, whereas intoxication and withdrawal from the substance, as well as the psychosocial stressors created by substance abuse, create the necessary proximal factors (Leamon & Bostwick, 2012). The diathesis-stress model also assumes that impulsivity, related to impairments in the prefrontal cortex that can impair executive functioning, also serves as a predisposing factor for both substance abuse and suicidal behaviors. Similarly, substance abuse can also impair executive functioning in its own right (Brent, 2010; Dougherty, Mathias, Marsh, Moeller, & Swann, 2004; Gvion & Apter, 2011).

It is also important to note that co-occurring depression is often linked to a substance-induced mood disorder that can occur as the result of use and withdrawal from a substance. The latter is particularly true of frequent users of cocaine; however, the mortality risks associated with problem use of cocaine, amphetamines, and opiates remain unclear, requiring more research in this area (Darke et al., 2007; Degenhardt et al., 2011). It is more likely that individuals who abuse cocaine, amphetamines, and opiates experience a decrease in their overall risk for suicide commensurate with ongoing substance abuse treatment and stable abstinence, resulting in a significant decrease in their experience of negative environmental stressors (Darke et al., 2007).

Of all substances, alcohol and its associations with suicide-related behaviors has been the subject of the most research (Leamon & Bostwick, 2012). Alcohol is implicated in up to 63% of suicide deaths, and over one fourth of individuals who died by suicide were found on autopsy to have used high levels of alcohol at the time of their deaths (Karch, Logan, & Patel, 2008; Leamon & Bostwick, 2012; Murphy, Wetzel, Robins, & McEvoy, 1992; Schneider, 2009). That number approaches 70% for those who have attempted suicide (Leamon & Bostwick, 2012). Comorbid major depression when associated with alcohol dependence is shown to significantly elevate the risk of suicide (Murphy et al., 1992; Zonda, 2006). Depressed patients who abuse alcohol have a greater history of aggression and impulsivity, two factors that are highly implicated in suicidal behaviors, and are more likely to report multiple suicide attempts, childhood abuse trauma, and use of tobacco (Brent, 2010; Sher et al., 2003, 2005).

Psychotic disorders.

Psychosis is another clinical risk factor highly associated with suicidal ideation and subsequent attempts and deaths by suicide (Warman, Forman, Henriques, Brown, &

Beck, 2004). The rate of suicide attempts by individuals who are diagnosed with schizophrenia is alarmingly high and estimated to range between 18% and 55%; it is estimated that up to 10% will eventually go on to die by suicide (Saha, Chant, & McGrath, 2007; Siris, 2001). Some of the unique factors that are associated with increased risk of suicide in patients with schizophrenia are fear of mental disintegration, agitation and restlessness, depression, and poor overall adherence with medication regimens (Hawton, Sutton, Haw, Sinclair, & Deeks, 2005; Siris, 2001). Auditory hallucinations that command individuals to harm themselves or others are well-established as high-risk acute factors for suicide. This is especially true when the hallucinations are identified by the individual experiencing them and are related to active delusional ideations (Juringer, 1990). Shorter term studies tend to suggest that younger individuals diagnosed with schizophrenia are at higher risk for suicide, whereas longer term studies suggest that the opposite may be true (Hor & Taylor, 2010). Suicidal behaviors can occur at any point during the course of schizophrenia (Heilä et al., 1997). In addition to schizophrenia, individuals who experience psychotic major depression, particularly delusional features, are at 2 to 5 times greater risk of dying by suicide than individuals diagnosed with nonpsychotic depression (Roose, Glassman, Walsh, & Vital-Herne, 1983; Wolfersdorf, Keller, Steiner, & Hole, 1987).

Personality disorders.

Individuals who suffer from severe characterological disorders are a population of particular concern, as they often lack the necessary psychological coping and problem-solving skills needed to effectively ameliorate intensely negative psychosocial stressors, which then place them at very high risk to attempt or die by suicide. Psychological autopsy and retrospective studies reveal that well over half of the individuals who have

died by suicide were diagnosed with a personality disorder (Baxter & Appleby, 1999; Brown, Beck, Steer, & Grisham, 2000; Isometsä, 2001). Some suggest that the reported rate of suicidal behaviors by individuals diagnosed with personality disorders may be artificially low, given that there is a greater tendency and bias towards reporting Axis I diagnoses (Linehan et al., 2005). Individuals who are diagnosed with personality disorders are most prone to severe psychosocial and environmental stressors, including work problems, family conflict, unemployment, and financial problems (Isometsä et al., 1996). Those personality disorders, previously classified in the *DSM-IV-TR* (American Psychiatric Association, 2000) as Cluster A and Cluster B prior to the introduction of the *DSM-V* (American Psychiatric Association, 2013), have been found to be associated with suicide attempts and death by suicide, whereas those personality disorders formerly classified as Cluster C do not in themselves present any increase in suicide risk, provided that any comorbid depression is properly assessed (Chioqueta & Stiles, 2004). It is also noteworthy that being diagnosed on more than one *DSM-IV-TR* cluster constitutes an independent high risk factor for suicide and needs to be assessed in its own right (Schneider et al., 2006).

Among those formerly classified as cluster A personality disorders, schizotypal personality disorder (SPD) appears to be most associated with suicide attempts due to its high correlations with adverse childhood history, major depression, and posttraumatic stress disorder (Bornstein, Klein, Mallon, & Slater, 1988; Markar, Williams, Wells, & Gordon, 1991; Schneider et al., 2006). Some studies suggest that there is an overlap in symptomatology between SPD and borderline personality disorder (BPD), the latter a

Cluster B disorder that is most highly associated with suicide attempts and deaths by suicide (Kavoussi & Siever, 1992; Markar et al., 1991).

As indicated, of all personality disorders, those formerly classified as cluster B are most commonly associated with suicide attempts and deaths. Highest among these are antisocial personality disorder (ASPD) and BPD (Corbitt, Malone, Haas, & Mann, 1996; Duberstein & Conwell, 1997; Engstrom, Alling, Gustavsson, Oreland, & Träskman-Bendz, 1997; Isometsä et al., 1996; Lecrubier, 2001; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2004). Those diagnosed with ASPD are at 3.7 times greater risk than the general population of attempting suicide; this figure increases to as much as 9 times greater risk when analyses are restricted to ages 30 and under (Beautrais et al., 1996; Pompili, Ruberto, Girardi, & Tatarelli, 2004). The possibility of suicidal behavior is further increased in individuals in whom the diagnoses of ASPD and BPD are comorbid (Stone, Stone, & Hurt, 1987). Among all of the personality disorders on any of the three clusters, BPD is the only one that specifically incorporates suicidal and self-injurious behaviors as diagnostic criteria in the *DSM-IV-TR* (American Psychiatric Association, 2000). Additional factors that increase the risk of suicide attempts among individuals diagnosed with ASPD include substance abuse, childhood history of violence, and comorbid mental health disorders (Links, Gould, & Ratnayake, 2003).

An estimated 9% to 33% of all suicides are attributed to a diagnosis of BPD, which makes it an extremely important risk factor to be considered when such individuals present for assessment (Ahrens & Haug, 1996; Black, Blum, Pfohl, & Hale, 2004). As many as 84% of individuals who are diagnosed with BPD admit to having made at least one lifetime suicide attempt; many continue to experience chronic suicidal ideation and

nonsuicidal self-injurious behaviors for the purpose of relieving psychic tension and distress and verbalize intent to act on suicidal thoughts and impulses (Black et al., 2004). BPD with comorbid affective disorders and substance use disorders is particularly worrisome because of the high degree of associated impulsivity that interacts with violent and aggressive tendencies, both independent risk factors for multiple suicide attempts and death by suicide (Black et al., 2004; Brodsky, Malone, Ellis, Dulit, & Mann, 1997; Corbitt et al., 1996; McGirr, Paris, Lesage, Renaud, & Turecki, 2007; Yen et al., 2003). Additional historical factors associated with attempted suicides in those individuals diagnosed with BPD include childhood physical or sexual abuse, early parental loss or separation, and higher levels of education (Brodsky et al., 1997; Soloff, Lynch, & Kelly, 2002). Other risk factors that are associated with suicides in individuals diagnosed with BPD include extended psychiatric hospitalizations, academic or legal problems, lack of treatment, and violations of the treatment contract.

Comorbid disorders.

Mental health professionals conducting suicide risk assessments need to be particularly mindful that co-occurring psychiatric and substance use disorders appear to also require special attention, as the presence of these conveys significantly greater risks for attempts. The depressive symptom of hopelessness may be most related to suicidal ideation; however, the co-occurrence of anxiety/agitation and poor impulse control are more predictive of those individuals who will make the progression from the ideation stage to the development of a plan and, finally, an attempt (Nock, Hwang, Sampson, & Kessler, 2010). Retterstøl (1993), in his suicide process approach to understanding suicidal behavior, argued that suicidal thoughts are chronic throughout an individual's lifetime; however, these may remain dormant or free from conscious awareness and only

become activated in aversive environmental conditions for which the individual lacks the capacity to deal with them in an adaptive manner. This process hypothesis appears to make sense of the suicidal progression, wherein ideation may reflect depressive symptoms including hopelessness, relief from comorbid anxiety and agitation may lead to suicidal planning, and poor impulse control, which is often associated with abuse of substances and the emotional dysregulation inherent in specific personality disorders, may trigger a behavioral response.

In keeping with Retterstøl's process hypothesis, several epidemiological studies have found that the combination of major depression and at least one severe anxiety disorder is significantly associated with attempted suicide (Boden, Ferguson, & Horwood, 2007; Bolton et al., 2008; Pfeiffer, Ganoczy, Ilgen, Ziven, & Valenstine, 2009; Sareen, Cox et al., 2005). Another study demonstrated that individuals with multiple comorbid anxiety disorders were at greater risk for attempting suicide (Wunderlich, Bronisch, & Wittchen, 1998). Those individuals who are diagnosed with bipolar disorder and comorbid generalized anxiety disorder or panic disorder have been shown to be at even greater risk for suicide attempts and deaths by suicide, whereas comorbid substance abuse predicts an increased probability of suicide attempt, but not death by suicide (Simon, Hunkeler, Fireman, Lee, & Savarino, 2007). The synergistic effects of personality disorder, negative life stressors and comorbid Axis I disorders contribute to a large number of deaths by suicide (Heikkinen et al., 1997). It is important to note that the presence of a comorbid personality disorder in individuals diagnosed with bipolar disorder represents an independent risk factor that is strongly associated with a lifetime risk of suicide (Garno, Goldberg, Ramirez, & Ritzler, 2005).

Psychoneurological factors.

Postmortem studies have examined brain tissues and found that serotonergic abnormalities (5-HT) in the prefrontal cortex can serve as biological markers for suicidal behaviors (Stanley, Virgilio, & Gershon, 1982; Stanley & Mann, 1983). During these seminal studies, it was noted that the brains of suicide victims contained fewer presynaptic transporter sites in the ventral prefrontal cortex, hypothalamus, occipital cortex, and brainstem. Injuries to the ventral prefrontal cortex are also associated with problems in inhibiting cognitive and behavioral responses, thereby increasing the risk for an individual to act on impulsive, aggressive, or suicidal urges (Shallice & Burgess, 1996). Further studies of suicide victims have also found considerably lower levels of the serotonin metabolite 5-hydroxyindole acetic acid (5-HIAA) within the brainstem and modestly low levels in the cerebral spinal fluid (CSF) of individuals who have made serious suicide attempts (Asberg, Nordström, & Träskman-Bendz, 1986; Mann, Arango, Marzuk, Theccanat, & Reis, 1989). Lower levels of CSF 5-HIAA are found in individuals who attempt suicide and are diagnosed with schizophrenia, major depression and personality disorders when compared with individuals with the same diagnoses who do not go on to make an attempt (Cooper, Kelly, & King, 1992; Mann et al., 1996). Studies have also shown that individuals who suffer from major depression, have lower cerebrospinal levels of homovanillic acid (HVA), the major metabolite of dopamine in the central nervous system, but further research is necessary to determine whether this dysfunction is characteristic of suicide attempters (Mann, 2003; Dunlop & Nemeroff, 2007).

Role of aggression and impulsivity.

Many of the psychological vulnerabilities, such as aggression and impulsivity, are well-researched factors known to increase the risk potential for suicidal behaviors and are known to have a neurophysiological basis (Swann et al., 2005). It is well established that men tend to show more aggression and use alcohol to a greater extent than females (Murphy et al., 1992), which may partially explain the disparity in the rate of suicides between males and females. There is a multidirectional relationship between aggressiveness, impulsivity, substance abuse, and alcoholism in cases in which individuals have sustained head injuries. Aggressive individuals, substance abusers, and individuals who abuse alcohol are more susceptible to incurring a head injury, whereas a head injury itself, with damage to the frontal, limbic, and/or temporal lobes, can further exacerbate prodromal aggression, impulsivity, and disinhibition (McAllister, 1992).

Individuals conducting suicide risk assessments may wish to scrutinize the behavioral elements inherent in a number of psychiatric and substance use disorders, as these can provide the assessor with clues related to an individual's capability for the development of suicidal intent. Depression combined with hopelessness appears to establish the necessary conditions for the development of suicidal ideation, but these factors by themselves do not necessarily lead individuals to the development of a plan for suicide (Posner et al., 2011).

Special attention should be paid to those disorders known to have symptoms that motivate individuals to begin the process of planning for their eventual demise, as well as those which increase the probability that they will act upon such plan because of inherent impulsivity and aggression. A recent retrospective study conducted in Sweden that compared suicidal intent among individuals who died by suicide and survivors of a

suicide attempt, as measured by the SSI, suggests such a possibility and found that planning for suicide was the most important factor predicting eventual death by suicide (Stefansson, Nordström, & Jokinen, 2012). Logically, impulsivity and aggression become irrelevant factors in the absence of a suicide plan and, to a slightly lesser degree, when the suicide plan is determined to be unrealistic or highly improbable. The opposite would hold true in situations in which an individual observed or known to have a history of highly impulsive and/or aggressive behaviors endorses a suicide plan to use a potentially lethal method that is highly likely to lead to their demise. In the latter case, it seems logical that such individuals presenting to a hospital emergency department would be rated at the highest levels of risk. These particular suicide risk factors are particularly relevant within the veteran population that is the focus of this program evaluation.

Demographic factors.

There are a number of well-established demographic risk factors that are most strongly correlated with suicidal behaviors. Caucasian males over the age of 63 have extremely elevated suicide rates, whereas Caucasian men over the age of 85 represent the highest number of completions (Conwell et al., 2002). Males in general die by suicide at a rate that is 3 to 4 times greater than that of females, whereas females are 3 to 4 times more likely to make nonlethal suicide attempts than males (Simon, 2012). Compared to females, males with lower levels of education or with a marital status of divorced, widowed, separated, or never married are at an increased risk for suicide (Denney, Rogers, Krueger, & Wadsworth, 2009). Lower risks of suicide in both males and females are associated with having larger families, higher education, and stable employment (Denney et al., 2009). Having a family history of mental illness, especially depression and suicide, also contributes to the overall risk potential (Brent, 2010; Mann, Wateraux,

Haas, & Malone, 1999). These latter factors that contribute to a lower level of risk for both genders are significant because they provide individuals with immediate socially mitigated protective factors.

Proximal warning signs.

Because distal risk factors for suicide continuously lead to false positives in risk assessment, it is necessary to focus increased attention on indicators of imminent suicide risk (Rudd et al., 2006). As previously discussed, proximal risk factors, or warning signs, take into account the episodic aspects of the suicidal crisis. Warning signs are distinguished from risk factors, as they relate to the individual's sequelae rather than global, population-determined domains, and they recognize the primary role of precipitating events that can trigger suicidal behaviors (Maltzberger, Hendin, Haas, & Lipschitz, 2003). Such indicators of imminent risk include an individual's endorsement of suicidal ideation and plan, experience of emotionally stressful events, implicit measures assessing suicide-related outcomes, and posthospitalization transition (Fowler, 2012). Attention also needs to be paid to individuals who write about death, show sudden changes in their personality, behavior, eating or sleeping patterns, and demonstrate poorer performance in their academic and occupational functioning (Rudd et al., 2006).

Reliance on individual self-report of suicidal ideation, plan, and intent is inherently problematic, as it continues to present opportunities for suicidal individuals to overreport and underreport and to exaggerate their symptoms, affecting the overall reliability of using current suicidal ideation to predict future attempts (Borges, Angst, Nock, Ruscio, & Kessler, 2003). There are a number of indirect measures of implicit psychological processes that are known to have good predictive validity and low false-

positive rates (Cha, Najmi, Park, Finn, & Nock, 2010; Fowler et al., 2001; Hendin et al., 2010; Hendin, Maltzberger, & Szanto, 2007; Nock & Benaji, 2007). It is unlikely that any of these measures will be used as part of a suicide risk assessment to any large extent outside of the research environment, due to constraints of time and economic resources in most clinical settings.

Excessive psychosocial stressors, particularly those involving the actual or threatened loss of a significant interpersonal relationship, are associated with the increased risk of suicide (Heikkinen et al., 1997; Overholzer, Braden, & Dieter, 2012; Paykel, Prusoff, & Myers, 1975; Zonda, 2006). One recent study suggests that individuals were more likely to have made a suicide attempt if they had experienced serious interpersonal or legal problems such as incarceration in the month preceding the attempt, even when controlling for baseline diagnoses of BPD, major depressive disorder, substance abuse disorders, and history of childhood sexual abuse (Yen et al., 2005). In addition to interpersonal stressors related to threatened and actual loss, a number of studies have also found that unemployment status is often associated with a higher risk for suicide attempts (Brown et al., 2000; Duberstein, Conwell, Conner, Eberly, & Caine, 2004; Fergusson, Boden, & Horwood, 2007). One recent study, based on worlds theory (Bergner, 2006), suggests that individuals who die by suicide view the subjective conditions in their own world as more unlivable, unviable, and impossible than suicide attempters and those who are diagnosed with mental illness, but do not attempt suicide (Bunford & Bergner, 2012).

The emotional experiences surrounding psychiatric hospitalizations, before and after discharge, are among the most stressful that individuals may encounter. There are a

number of studies, suggesting that temporal factors based on hospital admissions and discharges can be predictive of future suicidal behaviors (Appleby, Mortensen, & Faragher, 1998; Goldacre, Seagroatt, & Hawton, 1993; Rossau & Mortensen, 1997). A large-scale study examining the discharge of 75,401 patients who had attempted deliberate self-harm found that more than 6% were readmitted for self-harm within 1 year, and a third of those occurred within the first 4 weeks after discharge (Gunnell et al., 2008). Another, more recent retrospective study of 238 patients who died by suicide within 3 months of hospital discharge found that 43% of suicides occurred within 1 month of discharge (Hunt et al., 2009). This study also found that the first day and first week after discharge were the highest risk periods. Another important finding from this study was that individuals who initiated their discharge from the hospital and did not follow up with recommended aftercare were more likely to die from suicide.

Protective factors.

Much of the suicidological research over the years has focused on pathological risk factors that are most commonly associated with suicidal outcomes (Fowler, 2012). With the advent of the positive psychology movement, increased emphasis has been placed on identifying any number of personal strengths that a suicidal individual possesses that can be used to moderate the risk factors. The identification of protective factors, often reciprocal strengths to the pathological risk factors and deficits previously mentioned, is an essential component of conducting a systematized suicide risk assessment, as risk factors alone will not identify an individual's global risk of suicide (Simon, 2011). Protective factors can be both internal and external. Internal protective factors refer to the psychological strengths, such as coping and problem-solving skills, that an individual has in a stressful situation, whereas external protective factors take the

individual's social relationships and life circumstances into account. Some of the more common protective factors that are identified by clinicians include having religious and moral beliefs that prohibit suicide (Dervic et al., 2004), identifying reasons for living (Linehan et al., 1983), being married for males (Kposowa, 2000; Kreitman, 1988; Smith, Mercy, & Conn, 1988), having responsibility for young children (Marzuk et al., 1997; Nock et al., 2008; Qin & Mortensen, 2003), having positive social supports available (Maimon, Browning, & Brooks-Gunn, 2010; Winfree & Jiang, 2010), having a positive therapeutic relationship between patient and clinician (APA, 2003; Simon, 1998), using psychotropic medications (Baldessarini, Tondo, & Hennen, 2003; Meltzer & Okayli, 1995), and having regular, brief, and caring supportive contacts by clinicians via telephone, letter writing, and consultation (Fleischmann et al., 2008; Guthrie et al., 2001; Motto & Bostrom, 2001).

Although each of the aforementioned protective factors can be useful in buffering the effects of pathological risk factors, they may not be fully effective if an individual's mental illness is too severe (Simon, 2012). Clinicians conducting a systematized suicide risk assessment will also need to be careful so as to not overestimate the relative strength of protective factors. An example of this particular danger is to assume that an individual's stated religious belief has moral proscriptions against suicide; however, the individual may, at that moment, believe that God has abandoned him or her. Although children nominally serve as a protective factor against suicide, the opposite might be true of a depressed patient who is dealing with an adolescent who is acting out (Simon, 2011). For individuals whose cognitive schemas cause them to believe that they are a burden on significant others, it is quite unlikely that highlighting family support will be helpful (Van

Orden, Lynam, Hollar, & Joiner, 2006). It is always advisable to obtain validation from both the patient and collateral sources that an individual's reported protective factors are, in fact, protective (Simon, 2011).

Risk and protective factors unique to U.S. veterans.

Nonfatal suicide attempts among veterans.

In spite of the difficulties in trying to identify accurate suicide data within the veteran population, what is known is that they comprise unique risk factors that place them at greater risk of dying by suicide than nonveterans in all age groups except the most elderly (Kaplan et al., 2007, 2012). The VHA has been interested in understanding what suicide risk factors, beyond those already recognized in current assessment tools, predict SDV in veteran and military populations (Haney et al., 2012). Risk factors significantly predicting suicide attempts include prior suicide attempts and depressive symptoms, as measured by the BDI (Hartl et al., 2005), elevated suicide or psychiatric symptoms based on the ASI, and alcohol and cocaine abuse (Ilgen, Harris, Moos, & Tiet, 2007). Research studies of Canadian military personnel found other unique risk factors predictive of future suicide attempts in men (Belik, Stein, Asmundson, & Sareen, J., 2009, 2010). These included having purposely injured or killed other people, exposure to toxic chemicals, life-threatening or limiting illness, and having been in a place where civilians were subjected to acts of terrorism.

Death by suicide among veterans.

As previously discussed, one of the most robust findings in the literature related to suicide risk factors is that male gender is associated with an increase in death by suicide. Within the veteran population, men are 3 times more likely to die by suicide than women (Ziven et al., 2007). Other demographic risk factors associated with veterans who die by

suicide when compared with nonveterans show that they are more likely to be older, White, and have completed exactly 12 years of education and are less likely to have ever been married (Kaplan, Huguet, McFarland, & Newsom, 2007). Predisposing factors to suicidal crises appear to be somewhat different between younger and older veterans. Younger veterans are more likely to have experienced problems with mental health, substance abuse, finances, and relationships prior to their suicide, whereas health problems were more common to older veterans (Kaplan, McFarland, Huguet, & Valenstine, 2012). Since the recent hostilities began in Iraq and Afghanistan, over half of the 2.3 million American service members have completed more than one deployment. Some military personnel have served as many as three or four deployments. These very lengthy deployments create a significant emotional and financial strain on families and significant others who are left behind and threaten to rupture very important means of social support and perceived reasons for living for individuals who may be at risk for suicide (Howell & Wool, 2011).

As in the general population, the presence of any psychiatric disorder has been associated with increased risk of suicide among veterans (Ilgen et al., 2012). Veterans who die by suicide are most likely to have been diagnosed with a depressive disorder or alcohol or other substance use disorder (Ziven et al., 2007; Ilgen et al., 2010). In descending order, bipolar disorder, depression, substance use disorders, schizophrenia, other anxiety disorders, and posttraumatic stress disorder (PTSD) appear to confer the highest suicide risks for male veterans, whereas among female veterans, the greatest risks are conferred by substance use disorders, bipolar disorder, schizophrenia, depression, PTSD, and other anxiety disorders (Ilgen et al., 2010).

PTSD is a commonly associated risk factor among veterans, most noticeably among those who have had combat experiences (Kulka et al., 1990; Bullman & Kang, 1996; Bruce, 2010; Klepsies et al., 2011). A number of studies have shown that veterans with combat-related PTSD are at greater risk for attempting and completing suicide than veterans without PTSD or the general population (Bullman & Kang, 1994; Kramer et al., 1994). Differences in psychobiology between military personnel diagnosed with PTSD who have been exposed to combat stressors and those diagnosed with PTSD stemming from issues, such as military sexual traumas and training accidents, unrelated to combat can be explained by the fact that the former do not respond as well to psychological and psychopharmacological treatments (Sher & Yehuda, 2011). Greater symptomatology, including higher levels of intrusive cognitive experiences, such as flashbacks, nightmares, and vivid memories, are associated with the increase of suicidal ideation and overall suicide risk (Amir, Kaplan, Efroni, & Kotler, 1999; Bell & Nye, 2007). Thoughts of suicide may be seen as a means by which to decrease or escape intolerable intrusive psychological events among combat veterans (Bell & Nye, 2007). Combat-related guilt, often experienced as either survivor guilt or guilt over having actively participated in events that are incongruent with one's fundamental values, has been associated with suicidal ideation and attempts (Hendin & Hass, 1991).

Further studies focused on suicide risk in veterans have found that individuals who have suffered physical injuries are at an increased risk, particularly those with multiple wounds (Bullman & Kang, 1996). Veterans who have sustained traumatic brain injuries (TBIs) are commonly treated as outpatients in the VHA. Studies on nonveterans suggest that individuals with TBIs experience a high degree of hopelessness and suicidal

ideation, leading to a significant level of suicide attempts and completions (Silver, Kramer, Greenwald, & Weissman, 2001; Simpson & Tate, 2002; Teasdale & Engberg, 2001). The serious cognitive impairments associated with TBIs are often psychologically devastating to the individual experiencing them because these can lead to changes in previously assumed relational and occupational roles and to newly developed emotional and psychiatric problems, including deficits in impulse control (Brenner, Homaifar, Adler, Wolfman, & Kemp, 2009).

As previously discussed, there is sufficient evidence to suggest that the mere possession of a firearm in the home significantly increases the potential for suicide risk among all age groups (Kellerman et al., 1992; Miller & Hemenway, 1999). Research and mortality data reveals that firearms are the most widely used method for completing a suicide among male veterans and are used almost exclusively within the elder male veteran population (Lambert & Fowler, 1997). Most veterans, both combat and noncombat, are well trained in the use of firearms, and combat veterans in particular have a great deal of experience in their use. Veterans receiving care through the VHA are very likely to have firearms and ammunition in their homes, often reporting a greater feeling of security and sense of control by having them readily available (Lambert & Fowler, 1997; Oslin et al., 2004). Concerns with respect to the problematic use of alcohol and firearm availability and their concomitant mediation of suicide attempts are particularly salient when considering the veteran population (Oslin et al., 2004).

Individuals experiencing homelessness and unemployment have the same risk factors common to the general population, including the presence of psychiatric disorders (Benda, 2003; Desai, Dausey, & Rosenheck, 2005; Rodell, Benda, & Rodell, 2003;

Suicide Prevention Resource Center, 2008; U.S. Interagency Council on Homelessness, 2010). One study suggests that protracted periods of homelessness and unemployment are predictive of suicidal ideation (Benda, 2003). Although no specific statistics regarding the suicide rate among homeless and unemployed veterans exist, as of December 2012, it is estimated that veterans comprised 10% of homeless individuals in the United States (U.S. Department of Housing and Urban Development, 2012). Male veterans have traditionally been overrepresented in the homeless population (Rosenheck, Frisman, & Chung, 1994). One study of homeless adults in a large, urban metropolitan area found that 22% had made at least one suicide attempt and 25% reported suicidal ideation in the last year (Gelberg, Linn, & Leake, 1988).

Incarceration is a well-established risk factor for suicide that, when combined with veteran status, may place the incarcerated veteran at greater risk than the general veteran population or the overall incarcerated inmate population. This is primarily due to the similarities in risk factors between the population of incarcerated veterans and the risk factors and behaviors of inmates most likely to attempt suicide while incarcerated (Wortzel, Binswanger, Anderson, & Adler, 2009). Combinations of six characteristics among incarcerated inmates are known to account for the vast majority of suicides in jails. These are age greater than 40 years, homelessness, history of psychiatric disorder, history of drug use, one prior incarceration, and being charged with a violent offense (Blaauw, Kerkhof, & Hayes, 2005). A number of neuropsychiatric factors common to combat veterans, such as TBIs and PTSD, contribute to aggressive behaviors and impaired ability to inhibit impulsive behaviors. As a result, veterans are more likely than nonveterans to be convicted of violent offenses, including homicide, rape, and sexual

assaults, and in many cases, the victims are more likely to be female, minors, or known to the offender (Wortzel et al., 2009).

One important trend that has been identified in suicide research with veterans pertains to utilization patterns of medical services proximate to the completion of a suicide. One particular retrospective study utilized the data on 1,843 veterans diagnosed with depression who died by suicide. The study found that 51% of these veterans died by suicide within 30 days of their last contact with a medical provider at the VHA. Of these, 43% had been seen by a mental health service provider, whereas the majority were seen in a general medical setting (Smith et al., 2011). Another study that examined the role of substance use disorders utilized similar data on 3,132 veteran decedents of suicide who had a substance use disorder diagnosis. Again, similar findings in utilization patterns were found in the month preceding the veteran's suicide. Approximately 56% died within 30 days of their last VHA contact, and 24% were last seen within the past week (Ilgen et al., 2011). Again, only a small minority were last seen in a mental health setting, whereas the majority received care in general medical settings.

Protective factors among veterans.

There are a number of known protective factors that can be used to mitigate the suicide risk factors that are unique to veterans. These include camaraderie with other veterans, active engagement in mental health and substance abuse treatment, restricted access to firearms, and increased social support networks (Simon, 2012). Having direct access to VHA services and benefits provides veterans with a safety net that serves to mitigate the number of distal and proximal risk factors. This is particularly true of veterans who receive service-connected financial compensation, pensions, and health services. Veterans whose service records document that their current physical and

psychiatric maladies can be connected to the time they served on active duty are awarded financial compensation that is rated from 10% to 100% for each disorder, depending on its severity. From this is derived the term *service-connected disability*. Studies have shown that service-connection status itself may serve as a protective factor against suicide because it alleviates the anxiety normally associated with financial uncertainty and provides veterans with a lifetime social connection to the VA and its services, as well as camaraderie with other veterans (Desai, Dausey, & Rosenheck, 2005; Ziven et al., 2007).

Another known protective factor that has been identified in VA-based studies is involvement with the criminal justice system, especially in cases in which mental health or substance use treatment is legally mandated. The structure, accountability, and support provided to veterans who are required to regularly meet with a probation or parole officer or to participate in a long-term substance abuse treatment program have research evidence to support their utility as protective factors (Ilgen et al., 2007).

Emergency department assessment of suicide.

Suicidal ideation and behaviors comprise the most common psychiatric emergency in hospital settings (Zeller, 2010). Typical scenarios for which individuals present to emergency departments include surviving a suicidal attempt, being thwarted by others from carrying out a suicide, endorsing suicidal ideation, and engaging in acts that further suggest contemplation of death by suicide. Mental health professionals in these settings are tasked with conducting a comprehensive and systematic suicide risk assessment and are typically concerned with issues of immediate management of suicidal patients. Although suicidal ideation and behaviors can be used to justify a hospital admission, it is not always appropriate to utilize this intervention, particularly if suicide

risks can be mitigated. Discharge from a hospital emergency department setting after a suicide attempt or suicidal ideation can occur when it is a reaction to precipitating circumstances and the individual's perspective about the situation has changed, the method of suicide has low lethality and intent, the individual has access to a supportive social network and living environment, and the individual has the capability to follow up with aftercare recommendations (American Psychiatric Association, 2003).

A number of studies demonstrate that clinicians may overcautiously and defensively utilize hospitalization in many cases in which outpatient treatment would be more appropriate (Schnyder & Valach, 1997). There is always a risk of rupture in a therapeutic relationship as levels of care become more restrictive. Alternatively, hospitalization should be considered for suicide attempts that involved the use of a potentially lethal method, endorsement of a specific plan, access to means, and intent to die, expression of remorse for the failed suicide attempt, or in the absence of any social protective factors (Zealberg & Santos, 1996). When it appears that suicide risk is imminent, clinicians can work in a patient-centered, therapeutic manner to increase the possibility of securing a voluntary hospital admission. However, when there is a clear and present danger and patients refuse voluntary hospitalization, involuntary hospitalization is the ethical and logical alternative.

Summary.

A review of the most current literature related to suicide risk assessment suggests that there is no fully valid and reliable method for accomplishing this most complex task. Consequently, the task of consistently predicting suicide remains impossible. It also demonstrates that a good working knowledge of the empirical data on static risk factors and protective factors forms the basis for understanding suicide risk and enhancing

estimates of global risk in clinical populations. Viewing assessment from a multicultural perspective, including a number of different demographic considerations, can help to increase the validity and reliability of assessment. The data on suicide risk suggests that a large number of possibilities can be unwieldy and can lack the necessary ecological validity required for generalizing empirical findings on suicide risk to individual cases outside of research settings.

A consensus seems to imply that a systematic suicide risk assessment, comprised of analyzing and synthesizing distal and proximal risk factors as well as patient-relevant protective factors, is critical to developing a treatment plan targeted to suicide prevention activities and treatment. Systematic suicide risk assessment also meets all of the legal and ethical standards of reasonable care. Defining what is reasonable may be a much more difficult undertaking.

Being able to verbally elicit a suicidal individual's potential for engaging in SDV requires great skill and the ability to develop rapport and actively listen in order to understand the patient's perspective (Shea, 2004). To this end, mental health professionals in busy emergency department environments need to spend a reasonable amount of time developing a working alliance with their patients who endorse suicidal ideation and developing skills in observing verbal and nonverbal behaviors and asking questions in a noninterrogative, nonjudgmental manner. An understanding of the sociocultural determinants of suicide is also necessary to ensure that the established knowledge base on risk and protective factors reflects those that exist within a specific subculture. The veteran population itself represents such a subculture, in which rarefied

rules of self-governance and unique historical experiences carry over into civilian life to form unique risk and protective factors.

This study sought to identify how effectively mental health professionals at the VA medical center where this program evaluation was conducted used the empirical evidence base on risk factors to inform clinical judgment and recommend appropriate treatment. The hypotheses were influenced by the findings of previous research studies indicating a significant amount of variation among emergency department providers in identifying risk factors that influence assessment of suicide risk and subsequent treatment recommendations (Hurry & Storey, 2000; Kapur et al., 1997) and another study that found that ED physicians' assessments of high suicide risk were significantly influenced by their perceptions of an individual's current mental status and functioning and historical factors were, on the whole, overlooked (Cooper et al., 2003). The findings of Cooper and colleagues suggest that ED staff operating in chaotic environments that are more suitable to using an NDM model may necessarily focus and direct their efforts to identify active symptoms and behaviors that would, from their own clinical experiences, suggest that an individual is at imminent risk of acting in a violent manner. These findings may also suggest that factors of bounded rationality and cognition may necessarily take precedence over static or historical markers known to increase suicide risk, making the latter less salient when limited cognitive resources in stressful and chaotic environments are focused on preventing potentially dangerous outcomes.

To date, there are no known studies that have specifically looked at the role protective factors may play in influencing ED mental health professionals' assessment of suicide risk and treatment recommendations. Referring to the previous argument that the

use of cognitive resources in chaotic environments will be necessarily focused on identifying clinical symptoms and behaviors that portend threats for an individual to imminently act in a violent matter may result in protective factors and static historical factors having little or no salience in the assessment process. Protective factors may also be overlooked in favor of observable symptoms and behaviors because the latter cannot always be verified as such and, as the review of the literature suggests, can be completely invalid if the ED physician relies solely on the self-report of an individual who fully intends to act in a self-injurious manner.

Based on the assumptions that ED mental health professionals' suicide risk ratings may reflect attention to dynamic, short-term, or imminent risk factors for deliberate self-harm to the exclusion of distal factors, it would also seem unlikely that ratings of moderate or high risk will reflect the long-term risk of an individual who is chronically prone to engaging in deliberate self-harm. As previously mentioned, it is not currently possible to predict when such an individual will experience significant environmental stressors that will trigger a suicidal crisis. Individuals in suicidal crises who present for professional intervention may be ambivalent about life and death and at least minimally willing to obtain assistance with overcoming the psychological pain associated with such ambivalence. In a sense, it might be said that such individuals are engaging in effective problem-solving by presenting to the ED, whereas those who do not engage in help-seeking behaviors are vulnerable to engaging in deliberate self-harm. The following hypotheses reflect naturalistic clinical decision making by ED professionals regarding suicidal veterans who were, on the whole, amenable to being assessed while in crisis.

Research hypotheses.

1. It was hypothesized that veterans' reports of a past suicide attempt within 30 days of evaluation in the ED would be positively associated with a provider rating of high risk.
2. It was hypothesized that the following modifiable risk factors would be more likely to be positively associated with a provider rating of high suicide risk: current suicidal ideation, current psychiatric or substance use disorder, hopelessness, command hallucinations to hurt self, highly impulsive behaviors, agitation or severe agitation, perceived burden on family, chronic pain/serious medical problems, homicidal ideation, aggressive behaviors towards others, available method for suicide, and inability or unwillingness to engage in safety planning.
3. It was hypothesized that these same modifiable risk factors would be more likely to be positively associated with a provider rating of moderate suicide risk.
4. It was hypothesized that provider ratings of high risk would be more likely to be associated with subsequent suicide attempts than ratings of moderate or low risk.
5. It was hypothesized that provider ratings of moderate risk would be more likely to be associated with subsequent suicide attempts than ratings of low risk.

Chapter 2

Method

This chapter describes the methodology of the current program evaluation, including its design, participants, and procedures to determine how empirically based suicide risk and protective factors may influence ED mental health professionals' formulations of global risk, as well as whether those global risk ratings can be positively associated with acts of SDV in the near and distant future.

Design and design justification.

This was a retrospective cohort study that was designated as a quality assurance program evaluation by the Institutional Review Board at a large, northeastern U.S. VA medical center. This program evaluation was limited to utilizing archived data that is already contained in the VHA's Computerized Patient Records System (CPRS) and the Suicide Prevention Applications Network (SPAN). In the case of current program evaluation, a retrospective cohort design was a logical choice because the target population and procedure was limited to suicidal veterans who presented to the ED in crisis and received a suicide risk assessment provided by any one of the available behavioral health professionals. Such a design allowed the researcher to analyze the predictor variables, in this case, suicide risk factors, in a manner that was relatively free from inherent bias.

Subjects.

Medical records reflecting that a formal suicide risk assessment was conducted on any actively suicidal veteran by a licensed mental health professional in the medical center's ED were eligible for inclusion in this program evaluation.

All veterans whose medical records reflected that they had presented to the ED and actively endorsed suicidal ideation at any time during the 2-year study period (January 1, 2011, to December 24, 2012) and had a documented suicide risk assessment conducted by an ED mental health professional were included in this program evaluation.

Data were excluded in the following circumstances: a documented suicide risk assessment was not available, data were incomplete, the patient was ineligible to receive VA services but received ED psychiatric services for humanitarian reasons, or the patient was a veteran dependent eligible for medical treatment at the VHA.

Procedure.

All of the data that was collected for this program evaluation was readily available in CPRS and the SPAN database. Subjects were identified by a 5-character code comprised of the first letter of their last name and the last four digits of their social security number. If more than one subject possessed the same identifier based on the criteria, the demographic information was reviewed to confirm their unique identity. In those rare cases in which two subjects shared the same 5-character code, their initial letter was changed to an 'X' to avoid misidentification of subjects. Specific demographic variables of interest were gender, race, age, combat status, and marital status. A standardized suicide risk assessment screening tool, the PVAMC Comprehensive Suicide Risk Assessment (Appendix), adapted from the Columbia–Suicide Severity Ratings Scale (Posner et al., 2011), contains the remaining independent variables (risk and protective factors) that were previously entered into CPRS by an ED behavioral health professional during the 2-year period being evaluated. The data on veterans who engaged in SDV at any time subsequent to a suicide risk assessment in the ED were obtained through a data user agreement with the VA's Center for Excellence, which administers the SPAN

database. VHA procedures for maintaining patient confidentiality were strictly adhered to. Strict procedures to de-identify any information that could be traced back to any individual veteran were followed. To maintain the security and integrity of the collected data files, these were saved to one laptop computer and backed up onto two flash drives and one external hard drive, all of which were located in a locked office. Access to these files was restricted through the use of password protection. Data was further protected through the use of Kaspersky antivirus software, which also offered spyware protection.

Selection of single patient records.

The first three hypotheses required the evaluation of ED behavioral health professionals' global suicide risk ratings, whether the patient was endorsing suicidal ideation, whether the patient had made a suicide attempt within the preceding 30 days, and the presence or absence of the 15 risk factors contained in the PVAMC Comprehensive Suicide Risk Assessment. Accordingly, only one record per patient was chosen for the analyses. The following rules were established to select records for patients who had multiple suicide risk assessments:

1. If a patient had a record with a suicide attempt in the preceding 30 days, that record was chosen for analysis. If the patient had multiple records with suicide attempts, then the most recent month with a suicide attempt was selected for analysis. If the patient had multiple records with a suicide attempt in the previous month, then the record with the highest level of risk was selected for analysis. If the patient had multiple records with a suicide attempt in the previous month, and the levels of rated risk were the same, then only one of these records was randomly selected for use in the analysis.

2. If a patient had no records with a suicide attempt in the preceding 30 days, but had reported suicidal ideation to the assessor, then that record was chosen for the analysis. If a patient had multiple records reflecting that they had reported suicidal ideation, the record for the previous month in which this was reported was selected for the analysis. If a patient had multiple records reflecting that they had reported suicidal ideation in the previous month, the record with the highest level of global risk was selected to be used in the analysis. If a patient had multiple records reflecting the endorsement of suicidal ideation in the previous month and these reflected the same level of global risk, then only one of these records was randomly selected to be used in the analysis.
3. If a patient had endorsed no suicidal ideation or reported a suicide attempt in the past 30 days, then the record reflecting that patient's latest suicide risk assessment was selected. If a patient had more than one record in the previous month, then the record reflecting the highest level of global risk for suicide was selected for the analysis. In those cases in which two or more records reflected the same level of global risk, only one of those records were randomly selected for use in the analysis.

Selection of multiple patient records.

The remaining two hypotheses required the comparison of subsequent SDV with behavioral health professionals' assessments of global ratings of suicide risk. Therefore, only patients with multiple records in different months were chosen for the analyses. Records for patients who had engaged in SDV after a suicide risk assessment in the ED were selected in the same manner as specified in the preceding section for single patient records. SPAN records that reflected SDV prior to a suicide risk assessment in the ED

were excluded from these analyses. The records for prior suicide risk assessments were selected in the following manner:

1. The suicide risk assessment that was most proximate in time to the subsequent SDV event reflected in SPAN was selected for the analysis. If two or more suicide risk assessments were conducted in the month most proximate to the subsequent SDV event reflected in SPAN, the assessment with the highest categorical rating of global suicide risk was chosen for analysis. If more than one suicide risk assessment in the month most proximate to the SDV event reflected in SPAN contained the highest categorical rating of global suicide risk, then only one of these records was selected.
2. Suicide risk assessments reflecting the highest level of global risk prior to the subsequent SDV were selected for analysis. Only the earliest completed risk assessment was selected for those patients who had two or more suicide risk assessments containing the same categorical rating of global suicide risk. If more than one suicide risk assessment was conducted in the same month and they contained the same categorical risk rating, then only one assessment was randomly selected for the analysis.

Months between suicide risk assessment and subsequent SDV events.

Records were coded by the month and year in which they were conducted, from January 1, 2011, to December 24, 2012. When there were multiple records for any individual patient, the month of all records prior to the month selected for an SDV event was subtracted from the month selected for that specific SDV event. No computations were conducted for records containing SDV events that occurred subsequent to a selected SDV event. For example, if a subject had three records, May 2011, August 2011, and February 2012, and August 2011 was recorded as the only SDV, then this was selected as

the working record for the SDV event. May 2011 would be computed as 3 months prior to the record selected, whereas the February 2012 record would not have had the months in between computed.

Measures.

As indicated earlier in the Procedures section, this study relied on the use of a standardized checklist, known as the PVAMC Comprehensive Suicide Risk Assessment, adapted for PVAMC use within the CPRS from the Columbia–Suicide Severity Rating Scale: Risk Assessment Version (C–SSRS). This five-part checklist required the ED behavioral health professional to document his or her clinical judgment and decision making about a veteran’s suicide risk from a list of 15 risk factors and 7 protective factors that are very well supported empirically. ED professionals simply marked the risk and protective factors they identified to develop their global rating of the suicidal veteran’s overall risk. The checklist serves primarily as a prescriptive measure to augment clinical interviews and not as an actuarial instrument; therefore, none of the individual risk and protective factors are given values and are not scored. Finally, ED behavioral health professionals were required to provide a categorical rating of global suicide risk level ranging from low to high and final treatment planning disposition.

Because the PVAMC Comprehensive Suicide Risk Assessment contains two categories for high risk, high with recent attempt and high with no attempt, both categories were combined to reflect provider ratings of high risk.

Chapter 4

Results

Demographic characteristics of the study cohort.

A total of 2,506 suicide risk assessments previously conducted by behavioral health professionals on 1,560 veterans who had presented to the ED of this large Veterans Affairs medical center located in the northeastern United States met inclusion criteria for this program evaluation. Of that total, 1,120 veterans (71.8%) received only one suicide risk assessment during the study period; the remaining 440 (28.2%) received more than one suicide risk assessment ($M = 1.6$, $SD = 1.4$). The demographic characteristics of the study population are shown in Table 1.

Most of the veterans who received a suicide risk assessment in the ED were male (94%), 35 years of age or older (85.1%), Black (56.4%), unmarried (79.2%), and not rated for combat (85.0%).

Table 1.

Demographic Characteristics (Percentages in Parentheses)

Variable	Male (n = 1,467)		Female (n = 93)		Total (N = 1,560)	
Age						
< 35	203	(13.8)	29	(31.2)	232	(14.9)
≥ 35	1,264	(86.2)	64	(68.8)	1,328	(85.1)
Race						
White	575	(39.2)	36	(38.7)	611	(39.2)
Black	828	(56.4)	52	(55.9)	880	(56.4)
Hispanic	51	(3.5)	1	(1.1)	52	(3.3)
Asian/Pacific Islander	10	(0.7)	3	(3.2)	13	(0.8)
Native American	3	(0.2)	1	(1.1)	4	(0.3)
Marital Status						
Unmarried	1,152	(78.5)	83	(89.2)	1,235	(79.2)
Married	315	21.5)	10	(10.8)	325	(20.8)
Combat Rated						
No	1,240	(84.5)	86	(92.5)	1,326	(85.0)
Yes	227	(15.5)	7	(7.5)	234	(15.0)

Evaluators.

A total of 104 different behavioral health professionals conducted suicide risk assessments in the ED during the 24-month study period and were either full-time or part-

time employees of the medical center. Of this total, 71 were physicians, including psychiatry residents; the remaining 33 were licensed psychologists, licensed clinical social workers, or clinical nurse practitioners. Each month averaged approximately 100 visits to the ED, with the most frequent (136 visits) being in May 2012. Of the 2,506 suicide risk assessments, 844 (33.7%) led to an acute psychiatric admission; the remaining 1,662 (66.3%) visits resulted in referrals for outpatient behavioral health specialty services.

Subsequent self-directed violence (SDV).

The SPAN database recorded a total of 110 veterans (7.1%) of this study cohort who subsequently engaged in acts of SDV from January 1, 2011 through December 31, 2013. The majority of the SDV events (88) involved male veterans over 35 years of age. Caucasians and African Americans engaged in postassessment SDV in approximately equal numbers, 46.4% and 49.1%, respectively. Hispanics comprised 4.5% of the total number of SDV events. Additionally, those veterans who reported a nonmarried status engaged in SDV 3 times more often than those who reported a marriage or partnership status. Noncombat veterans ($n = 90$) engaged in subsequent SDV much more often than those who were combat rated ($n = 20$). Younger combat veterans under the age of 35 ($n = 12$) engaged in subsequent SDV more often than those combat veterans who were ages 35 or older ($n = 8$).

Most months averaged 10 SDV events, with the largest number (15) occurring in February 2012. Three veterans from this study cohort subsequently died by suicide. It is significant to note that two of the three veterans who died by suicide previously received low suicide risk ratings in the medical center's ED.

Testing of the hypotheses.

The analyses of all of the data constituting the independent and dependent variables for the five hypotheses in this program evaluation were conducted utilizing SPSS, Version 22 software.

A chi-square analysis was performed to determine whether there were any statistically significant differences between veterans' reported SDV events within the previous 30 days and an ED mental health professional's subsequent suicide risk rating, as shown in Table 2. As predicted, there was a statistically significant and strong association between an act of SDV and an ED provider's rating of high risk, $\chi^2 (1, N = 1,560) = 502.128, p < 0.001$; Cramér's $V = .56$.

Table 2.

Relationship Between Suicide Attempt in Preceding 30 Days and Suicide Risk Rating

	Suicide Risk Rating		Total (N = 1,560)	p
	Low/Moderate (n = 1,364)	High (n = 196)		
Suicide Attempt in				
Preceding 30 Days				
No	1,332 (93.1%)	99 (6.9%)	1,431	< 0.0001
Yes	32 (24.8%)	97 (75.2%)	129	< 0.0001

Note. Values reflect the total number of veterans who reported to ED provider whether they had or had not engaged in an act of self-directed violence (SDV) within the 30 days prior to the current assessment.

Data analysis was conducted on the frequency distributions of provider selections for each of the 15 independent risk factors contained in the PVAMC Comprehensive Suicide Risk Assessment to determine whether their presence or absence resulted in a significant difference in providers' subsequent ratings of high suicide risk. Both the low and moderate risk categories were combined to form a not high risk category in order to distinguish them from high risk global ratings. Table 3 shows the frequency distributions and percentages.

Table 3.

Frequency Distributions of Individual Suicide Risk Factors (Percentages in Parentheses)

Risk Factor	Present				Not Present			
	High Risk		Low/ Moderate Risk		High Risk		Low/ Moderate Risk	
Suicidal Ideation	19	(19.2)	810	(80.8)	4	(0.7)	554	(99.3)
Prior Suicide Attempt	117	(21.1)	438	(78.9)	79	(7.9)	926	(92.1)
Hopelessness	132	(28.6)	330	(71.4)	64	(5.8)	1,034	(94.2)
Current Psychiatric Disorder	158	(12.7)	1,083	(87.3)	38	(11.9)	281	(88.1)
Hallucinations to Harm Self	24	(28.6)	60	(71.4)	172	(11.7)	1,304	(88.3)
Impulsive Behavior	82	(19.5)	339	(80.5)	114	(10.0)	1,025	(90.0)
Severe Agitation	49	(14.3)	293	(85.7)	147	(12.1)	1,071	(87.9)
Perceived Burden on Family	42	(29.6)	100	(70.4)	154	(10.9)	1,264	(89.1)
Chronic Pain/Serious Medical Problems	67	(18.8)	289	(81.2)	129	(10.7)	1,075	(89.3)
Homicidal Ideation	15	(13.0)	100	(87.0)	181	(12.5)	1,264	(87.5)
Aggressive Behaviors Toward Others	21	(14.5)	124	(85.5)	175	(12.4)	1,240	(87.6)
Method Available for Suicide	113	(17.7)	524	(82.3)	83	(9.0)	840	(91.0)
Refusal to Engage in Safety Planning	76	(27.7)	198	(72.3)	120	(9.3)	1,166	(90.7)
Recent Significant Losses	75	(22.1)	265	(77.9)	121	(9.9)	1,099	(90.1)
No Risk Factors	0	(0.0)	42	(100.0)	196	(12.9)	1,322	(87.1)

Note. Frequencies and percentages reflect the total number of times that a risk factor was present or absent within the veteran cohort during each suicide risk assessment.

Chi-square analyses revealed a statistically significant association between evaluators' final ratings of suicide risk and 8 of the 12 modifiable risk factors and all

three unmodifiable risk factors (Table 4). The modifiable risk factors were current suicidal ideation, $\chi^2 (1, N = 1,560) = 111.0, p < 0.0001, \text{Cramér's } V = .26$; hopelessness, $\chi^2 (1, N = 1,560) = 153.10, p < 0.001, \text{Cramér's } V = .31$; command hallucinations to harm self, $\chi^2 (1, N = 1,560) = 20.71, p < 0.001, \text{Cramér's } V = .11$; impulsive behaviors, $\chi^2 (1, N = 1,560) = 25.09, p < 0.001, \text{Cramér's } V = .12$; perceived burden on significant others, $\chi^2 (1, N = 1,560) = 41.16, p < 0.0001, \text{Cramér's } V = .16$; chronic pain/serious medical conditions, $\chi^2 (1, N = 1,560) = 16.43, p < 0.0001, \text{Cramér's } V = .10$; suicide method available, $\chi^2 (1, N = 1,560) = 26.25, p = 0.0001, \text{Cramér's } V = .13$; and refusal to engage in safety planning, $\chi^2 (1, N = 1,560) = 69.66, p < 0.0001, \text{Cramér's } V = .21$. The three unmodifiable risk factors that were found to be statistically significant were prior suicide attempt, $\chi^2 (1, N = 1,560) = 56.89, p < 0.0001, \text{Cramér's } V = .19$; significant recent losses, $\chi^2 (1, N = 1,560) = 35.68, p < 0.0001, \text{Cramér's } V = .15$; and having no risk factors, $\chi^2 (1, N = 1,560) = 6.20, p = 0.013, \text{Cramér's } V = .06$. Four modifiable risk factors did not reach statistical significance: current psychiatric/substance use disorder, $\chi^2 (1, N = 1,560) = 0.155, p = 0.694$; severe agitation, $\chi^2 (1, N = 1,560) = 1.24, p = 0.265$; homicidal ideation, $\chi^2 (1, N = 1,560) = 0.026, p = 0.872$; and aggressive behaviors towards others, $\chi^2 (1, N = 1,560) = 0.536, p = 0.464$.

Table 4.

Individual Suicide Risk Factors and Subsequent Ratings of Global Risk

Risk Factor	PPV/NPV (%)	χ^2 $df = 1$	p
Suicidal Ideation	19/99	111.00	< .0001
Prior Suicide Attempt	21/92	56.89	< .0001
Hopelessness	29/94	153.10	< .0001
Current Psychiatric/ Substance Use Disorder	13/88	0.16	0.694
Auditory Hallucinations	29/88	20.71	< .0001
Impulsive Behaviors	20/90	25.09	< .0001
Severe Agitation	14/88	1.24	0.265
Perceived Burden	30/89	41.16	< .0001
Chronic Pain/Medical	19/89	16.43	< .0001
Homicidal Ideation	13/88	0.03	0.872
Aggressive Behaviors	15/88	0.54	0.464
Suicide Method Available	18/91	26.25	< .0001
Safety Plan Refusal	28/91	69.66	< .0001
Significant Losses	22/90	35.68	< .0001
No Risk Factors	0/87	6.20	0.013

Note. PPV = positive predictive value; NPV = negative predictive value; CI = confidence interval; χ^2 = Chi-square value; df = degrees of freedom; moderate and low risk categories were combined to compare and analyze high risk versus not high risk ratings based on the presence or absence of each suicide risk factor.

Odds ratios (ORs) were calculated to determine the likelihood that ED evaluators would rate suicidal veterans at high risk based on individual risk factors (Table 4). Of those risk factors positively associated with a provider rating of high risk, endorsement of current suicidal ideation had the highest likelihood, OR 32.83, 95% CI 11.7-104.28. This was followed by the presence of hopelessness, OR 6.46, 95% CI 4.62-9.05; refusal to engage in safety planning, OR 3.73, 95% CI 2.66-5.23; perceived burdensomeness, OR 3.45, 95% CI 2.27-5.22; prior suicide attempt, OR 3.13, 95% CI 2.04-3.54; the presence of command hallucinations to harm self, OR 3.03, 95% CI 1.78-5.13; experiencing recent significant losses, OR 2.57, 95% CI 1.85-3.58; exhibiting impulsive behaviors, OR 2.18, 95% CI 1.58-3.0; having a suicide method available, OR 2.18, 95% CI 1.59-2.99; and having chronic pain or serious medical condition, OR 1.93, 95% CI 1.38-2.70. Although found to be statistically significant, in those cases in which no risk factors were identified, evaluators were unlikely to rate suicidal veterans at high risk, OR 0.00, 95% CI 0.00-0.79.

Sensitivity and specificity of each of the significant suicide risk ratings was determined by calculating their positive predictive values (PPV) and negative predictive values (NPV), as shown in Table 4. All 15 risk factors were found to be associated with a higher risk of a false positive rating. Those risk factors that were least associated with the potential for a false positive were: perceived burdensomeness, PPV = 30%; hopelessness, PPV = 29%; command hallucinations to harm self, PPV = 29%; and refusal to engage in safety planning, PPV = 28%. The remaining 11 risk factors had PPVs that

ranged from 0 (no risk factors) to 22% (recent significant losses), further increasing the odds that a suicidal veteran would be assessed to be at high risk when he or she was not.

Those risk factors that had the lowest NPVs and were most highly associated with a false negative were: aggressive behaviors, 88%; homicidal ideation, 88%; severe agitation, 88%; command hallucinations to harm self, 88%; current psychiatric/substance use disorder, 88%; and having no risk factors, 87%. The absence of the following risk factors was most likely to predict a true negative were: suicidal ideation, 99%; hopelessness, 94%; prior suicide attempt, 92%; suicide method available, 91%; refusal to engage in safety planning, 91%; impulsive behaviors, 90%; recent significant losses, 90%; perceived burdensomeness, 89%; and chronic pain/serious medical problems, 89%.

Chi-square analysis was conducted on the frequency distributions of provider selections for each of the 15 independent risk factors contained in the PVAMC Comprehensive Suicide Risk Assessment to determine whether their presence or absence made any significant difference in providers' subsequent ratings of moderate suicide risk. In this case, it was necessary to analyze the low, moderate, and high risk categories as separate entities to determine whether each served an independent purpose.

The frequency distributions and percentages for each risk factor and the corresponding global rating of suicide risk are reflected in Table 5. Those risk factors most associated with ED providers' assessment of high risk are: perceived burdensomeness (29.6% with this risk factor having a high rating, vs. 10.7% without factor), hopelessness (28.6% vs. 5.8%), hallucinations to harm oneself (28.6% vs. 11.75), and refusal to engage in safety planning (27.7% vs. 9.3%). The best predictors of ED providers' moderate risks rating (overall 41.1%) were: refusal to engage in safety

planning (57.7% vs. 37.6%), homicidal ideation (63.5% vs. 39.3%), and hallucinations to harm oneself (58.3% vs. 40.1%).

Table 5.

Frequency Distributions and Percentages of Individual Suicide Risk Factors and Perceived Suicide Risk Ratings

Risk Factor	Present						Not Present					
	High Risk		Moderate Risk		Low Risk		High Risk		Moderate Risk		Low Risk	
Suicidal Ideation	192	(19.2)	549	(54.8)	261	(26.0)	4	(0.7)	92	(16.5)	462	(82.8)
Prior Suicide Attempt	117	(21.1)	291	(52.4)	147	(26.5)	79	(7.9)	350	(34.8)	576	(57.3)
Hopelessness	132	(28.6)	262	(56.7)	68	(14.7)	64	(5.8)	379	(34.5)	655	(59.7)
Current Psychiatric Disorder	158	(12.7)	558	(45.0)	525	(42.3)	38	(11.9)	83	(26.0)	198	(62.1)
Hallucinations to Harm Self	24	(28.6)	49	(58.3)	11	(13.1)	172	(11.7)	592	(40.1)	712	(48.2)
Impulsive Behavior	82	(19.5)	205	(48.7)	134	(31.8)	114	(10.0)	436	(38.3)	589	(51.7)
Severe Agitation	49	(14.3)	180	(52.6)	113	(33.0)	147	(12.1)	461	(37.8)	610	(50.1)
Perceived Burden on Family	42	(29.6)	65	(45.8)	35	(24.6)	154	(10.9)	576	(40.6)	688	(48.5)
Chronic Pain/Serious Medical Problems	67	(18.8)	152	(42.7)	137	(38.5)	129	(10.7)	489	(40.6)	586	(48.7)
Homicidal Ideation	15	(13.0)	73	(63.5)	27	(23.5)	181	(12.5)	568	(39.3)	696	(48.2)

Risk Factor	Present						Not Present					
	High Risk		Moderate Risk		Low Risk		High Risk		Moderate Risk		Low Risk	
Aggressive Behaviors Toward Others	21	(14.5)	69	(47.6)	55	(37.9)	175	(12.4)	572	(40.4)	668	(47.2)
Method Available for Suicide	113	(17.7)	309	(48.5)	215	(33.8)	83	(9.0)	332	(36.0)	508	(55.0)
Refusal to Engage in Safety Planning	76	(27.7)	158	(57.7)	40	(14.6)	120	(9.3)	483	(37.6)	683	(53.1)
Recent Significant Losses	75	(22.1)	165	(48.5)	100	(29.4)	121	(9.9)	476	(39.0)	623	(51.1)
No Risk Factors	0	(0.0)	2	(4.8)	40	(95.2)	196	(12.9)	639	(42.1)	683	(45.0)

Note. Frequencies and percentages reflect the total number of times that a risk factor was present or absent within the veteran cohort during each suicide risk assessment.

Chi-square tests revealed that ED providers distinguished between a rating of moderate and low risk, and this was the case for all 15 predictor variables (Table 6). The values for these findings are as follows: suicidal ideation, $\chi^2 (1, N = 1,560) = 345.83, p < 0.0001$, Cramér's $V = .16$; history of suicide attempt, $\chi^2 (1, N = 1,560) = 97.92, p < 0.001$, Cramér's $V = .12$; hopelessness, $\chi^2 (1, N = 1,560) = 183.45, p < 0.0001$, Cramér's $V = .22$; a current psychiatric or substance use disorder, $\chi^2 (1, N = 1,560) = 43.29, p < 0.0001$, Cramér's $V = .07$; command hallucinations to harm self, $\chi^2 (1, N = 1,560) = 30.28, p < 0.001$, Cramér's $V = .06$; highly impulsive behaviors, $\chi^2 (1, N = 1,560) = 32.89, p <$

0.0001, Cramér's $V = .08$; severe agitation, $\chi^2 (1, N = 1,560) = 31.23, p < 0.0001$, Cramér's $V = .02$; perceived burdensomeness, $\chi^2 (1, N = 1,560) = 14.04, p = 0.0002$, Cramér's $V = .14$; chronic pain or serious medical problem, $\chi^2 (1, N = 1,560) = 4.61, p = 0.0316$, Cramér's $V = .10$; homicidal ideation, $\chi^2 (1, N = 1,560) = 29.29, p < 0.0001$, Cramér's $V = .05$; aggressive behaviors towards others, $\chi^2 (1, N = 1,560) = 4.09, p = 0.0429$, Cramér's $V = .00$; method available for suicide, $\chi^2 (1, N = 1,560) = 48.98, p < 0.0001$, Cramér's $V = .08$; refusal to engage in safety planning, $\chi^2 (1, N = 1,560) = 100.06, p < 0.0001$, Cramér's $V = .13$; recent significant losses, $\chi^2 (1, N = 1,560) = 30.78, p < 0.001$, Cramér's $V = .11$; and having no risk factors, $\chi^2 (1, N = 1,560) = 31.02, p < 0.0001$, Cramér's $V = .02$.

Further chi-square tests revealed that providers distinguished between a rating of high and moderate risk on 11 of the 15 risk factors (Table 6). These risk factors were: current suicidal ideation, $\chi^2 (1, N = 1,520) = 22.40, p < 0.0001$, Cramér's $V = .16$; prior suicide attempt, $\chi^2 (1, N = 1,560) = 12.27, p = 0.0004$, Cramér's $V = .12$; hopelessness, $\chi^2 (1, N = 1,560) = 42.22, p < 0.001$, Cramér's $V = .22$; current psychiatric or substance use disorder, $\chi^2 (1, N = 1,560) = 5.03, p = 0.025$, Cramér's $V = .07$; command hallucinations to harm self, $\chi^2 (1, N = 1,520) = 3.99, p = 0.046$, Cramér's $V = .06$; impulsive behaviors, $\chi^2 (1, N = 1,520) = 6.47, p = 0.011$, Cramér's $V = .08$; perceived burdensomeness, $\chi^2 (1, N = 1,520) = 17.2, p < 0.0001$, Cramér's $V = .14$; chronic pain/serious medical condition, $\chi^2 (1, N = 1,520) = 8.52, p = 0.004$, Cramér's $V = .10$; suicide method available, $\chi^2 (1, N = 1,520) = 5.36, p < 0.022$, Cramér's $V = .08$; refusal to engage in safety planning, $\chi^2 (1, N = 1,520) = 14.8, p < 0.0001$, Cramér's $V = .13$; and recent significant losses, $\chi^2 (1, N = 1,520) = 11.5, p < 0.0001$, Cramér's $V = .11$. The predictor variables severe agitation,

homicidal ideation, aggressive behaviors towards others, and having no risk factors were not statistically significant in this regard.

Further data analysis also revealed that ED providers distinguished between ratings of high and low risk on 14 of the 15 risk factors (Table 6): current suicidal ideation, $\chi^2(1, N = 1,560) = 236.07, p < 0.0001$, Cramér's $V = .50$; prior suicide attempt, $\chi^2(2, N = 1,560) = 116.68, p < 0.0001$, Cramér's $V = .35$; hopelessness, $\chi^2(1, N = 1,560) = 304.04, p < 0.0001$, Cramér's $V = .57$; current psychiatric or substance use disorder, $\chi^2(1, N = 1,560) = 5.16, p = 0.0230$, Cramér's $V = .07$; command hallucinations to harm self, $\chi^2(1, N = 1,560) = 48.40, p < 0.0001$, Cramér's $V = .22$; exhibiting highly impulsive behaviors, $\chi^2(1, N = 1,560) = 46.57, p < 0.0001$, Cramér's $V = .22$; severe agitation, $\chi^2(1, N = 1,560) = 9.32, p = 0.0023$, Cramér's $V = .10$; perceived burdensomeness, $\chi^2(1, N = 1,560) = 55.26, p < 0.0001$, Cramér's $V = .24$; chronic pain or serious medical problem, $\chi^2(1, N = 1,560) = 20.72, p < 0.0001$, Cramér's $V = .15$; homicidal ideation, $\chi^2(1, N = 1,560) = 5.42, p = 0.0198$, Cramér's $V = .07$; method available for suicide, $\chi^2(1, N = 1,560) = 52.35, p < 0.0001$, Cramér's $V = .23$; refusal to engage in safety planning, $\chi^2(1, N = 1,560) = 154.50, p < 0.0001$, Cramér's $V = .41$; recent significant losses, $\chi^2(1, N = 1,560) = 59.71, p < 0.0001$, Cramér's $V = .25$; and having no risk factors, $\chi^2(1, N = 1,560) = 11.33, p = 0.0008$, Cramér's $V = .11$. ED providers appeared to be unable to distinguish between high and low risk on the predictor variable aggressive behavior towards others, $\chi^2(1, N = 1,560) = 1.96, p = 0.1613$.

Table 6.

Suicide Risk Factors and Subsequent Categorical Risk Ratings

Risk Factor	High vs. Low Risk		Moderate vs. Low Risk		High vs. Moderate Risk	
	X^2	p	X^2	p	X^2	p
	$df = 1$		$df = 1$		$df = 1$	
Suicidal Ideation	236.07	< .0001	345.83	< .0001	22.40	< .0001
Prior Suicide Attempt	116.69	< .0001	97.92	< .0001	12.20	0.0004
Hopelessness	304.04	< .0001	183.45	< .0001	42.20	< .0001
Current Psychiatric Disorder	5.17	0.0230	43.30	< .0001	5.03	0.0248
Hallucinations to Harm Self	32.90	< .0001	30.29	< .0001	3.99	0.0457
Impulsive Behavior	46.60	< .0001	32.90	< .0001	6.47	0.0174
Severe Agitation	9.33	0.0023	31.23	< .0001	0.72	0.3971
Perceived Burden on Family	55.27	< .0001	14.05	0.0002	17.20	< .0001
Chronic Pain/Serious Medical Problems	20.72	< .0001	4.62	0.0316	8.52	0.0035
Homicidal Ideation	5.43	0.0198	29.30	< .0001	2.23	0.1357
Aggressive Behaviors Towards Others	1.96	0.1613	4.09	0.0429	0.00	0.9999
Method Available for Suicide	52.40	< .0001	49.00	< .0001	5.36	0.0206
Refusal to Engage in Safety Planning	154.50	< .0001	100.06	< .0001	14.80	< .0001
Recent Significant Losses	59.70	< .0001	31.30	< .0001	11.50	0.0006
No Risk Factors	11.30	0.0008	31.00	< .0001	0.61	0.4336

Note. χ^2 = Chi-square value, df = degrees of freedom; compares the presence and absence of each suicide risk factor with each category of risk rating.

Chi-square tests were conducted to determine whether there was a statistically significant difference between evaluators’ global assessment of high suicide risk and future acts of SDV. High risk was compared with the combined categories of low and moderate risk, heretofore known as not high risk. The results, which are presented in Table 7, reflect that provider ratings of high risk were significantly more likely to be associated with subsequent SDV events, $\chi^2 (1, N = 1,560) = 110.18, p < 0.0001$, Cramér’s $V = .26$. ED evaluators’ ratings of high risk predicted subsequent SDV 5.5 times more often than in veterans who were rated to be not at high risk.

Table 7.

Emergency Department (ED) Provider Suicide Ratings in Relationship to Subsequent Acts of Self-Directed Violence (SDV) (Percentages in Parentheses)

Suicide Attempt	Not High Risk	High Risk	Total
Yes	61 (4.5)	49 (25.0)	110 (7.1)
No	1,303 (95.5)	147 (75.0)	1,450 (92.9)
Total	1,364	196	1,560

Note. Not high risk = the combined ratings of moderate and low risk; *df* = degrees of freedom; low and moderate risk categories were combined to compare a high risk rating with not high risk rating.

Chi-square tests were conducted individually on all three risk categories to determine whether there was any statistically significant difference between ED

providers' ratings of moderate risk and subsequent acts of SDV. The results, which are presented in Table 8, indicated that a rating of moderate risk was associated with subsequent SDV at twice the rate of those rated at low risk, $\chi^2 (1, N = 1,560) = 7.36, p = 0.0067$, whereas a rating of high risk was over 4 times more likely to be associated with subsequent acts of SDV than in those veterans who were rated at moderate risk, $\chi^2 (1, N = 1,560) = 57.085, p < 0.0001, \text{Cramér's } V = .27$.

Table 8.

Emergency Department (ED) Providers' Suicide Risk Ratings in Relationship to Subsequent Veteran Acts of Self-Directed Violence (SDV)

	Emergency Department Suicide Risk Rating							
	Low		Moderate		High		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Suicide Attempt								
Yes	22	(3.0)	39	(6.1)	49	(25.0)	110	(7.1)
No	701	(97.0)	602	(93.9)	147	(75.0)	1,450	(92.9)
Total	723		641		196		1,560	

Note. Values reflect veterans who engaged in self-directed violence (SDV) at some point after receiving a suicide risk assessment in the ED and the rating provided.

Chapter 5

Discussion

Clinical implications.

This is the first known investigation of how emergency department mental health professionals determine categorical suicide risk ratings within the veteran population. In its ongoing efforts to prevent veteran suicides, the Department of Veterans Affairs expends a great deal of resources to identify and provide case management services to those individuals who are at greatest risk of engaging in future suicidal behaviors. The findings of this program evaluation have demonstrated that key empirically based suicide risk factors reliably inform evaluators' perceptions of categorical suicide risk assessment, even when such assessment is limited to using naturalistic clinical decision making. Furthermore, each of three categorical risk ratings appears to be able to independently distinguish between known risk factors that are known to increase the probability of future SDV. As predicted, the majority of veterans who subsequently engaged in SDV were previously rated at high risk. Those who were rated at low risk represented a very small segment of those veterans who engaged in SDV. The findings also suggest that although moderate risk identifies at-risk veterans more accurately than those at low risk, the statistical associations appear to be strongest when providers are distinguishing between high and low risk. The findings of this program evaluation corroborate what is already well known in the suicide literature: a history of self-directed violence is likely to result in mental health professionals' ratings of high risk.

Despite the cautionary approach suggested in the literature concerning the use of checklists in conducting suicide risk assessment, the results of this program evaluation seem to suggest that the use of such a prescriptive measure can effectively help providers

to guide and structure their clinical interviews. Overall, the vast majority of veterans who received suicide risk assessments in the ED were ultimately judged as not needing acute psychiatric hospitalization and were appropriately transferred to outpatient specialty mental health treatment. Veterans who were assessed to be at high risk were referred to the suicide prevention team for ongoing case management.

Distinguishing between moderate and high risk as well as between high and not high risk appears to be more difficult when there are specific risk factors for a veteran to engage in other-directed violent behaviors. Extensive research has shown that violent behaviors directed towards others, especially when substance abuse is involved, correlates highly with subsequent acts of violence towards self (Conner et al., 2001; Ilgen and Kleinberg, 2011). Aggressive behaviors and homicidal ideation as risk factors of concern did not reach statistical significance, which suggests that ED professionals did not consider them important risk factors, although they should be. A qualitative analysis may have provided further information on why other-directed violence was not factored into ED providers' ratings of high risk.

One of the more sobering findings of this program evaluation relates to the three veterans who subsequently died by suicide. As previously reported, two had previously received a low risk rating by ED providers. A third deceased veteran, who was rated to be at high risk, had engaged in an act of SDV within 30 days prior to presenting to the ED. Current suicidal ideation and severe agitation were the only the risk factors were common to all three. Significantly, severe agitation and those risk factors that suggest the possibility of violence toward others were least likely to result in a rating of high risk in this program evaluation.

The vast majority of the subjects in this veteran cohort possessed three demographic factors that are known to increase risk for self-directed violence: male gender, age greater than 35 years, and being unmarried. Also, the vast majority of these veteran subjects were not combat-rated, which is consistent with recent research suggesting that military-specific variables are not independently associated with suicide risk (LeardMann et al., 2013). It is also significant to note that the three deaths by suicide which occurred in this cohort involved two African American males and one African American female, which is contrary to the older, Caucasian, male population that is typically represented.

The results of this program evaluation also suggest that whether a risk factor was modifiable or unmodifiable appears to have had no influence on an evaluator's final rating of suicide risk. The implications of this finding are critical, as they suggest that ED mental health providers may be primarily focused on assessing for acute or imminent risk while overlooking chronic, distal risk factors that underlie future, longer term risk for engaging in SDV. One assessment strategy that may be useful in avoiding these potential pitfalls, as offered by Wortzel et al. (2014), is to develop a two-dimensional risk stratification system that also takes into consideration both the severity and temporality of risk factors by providing categorical risk ratings along both the acute and chronic dimensions.

Limitations.

The hypotheses for this program evaluation were limited to examining the role that empirically based suicide risk factors playing in forming mental health professionals' perceptions of global suicide risk, so it is quite possible that although they were omitted from this program evaluation, identified protective factors may have played some

important role in determining the outcome variables. ED professionals are also likely to have approached suicide risk assessment in an idiosyncratic manner that cannot be controlled for in a retrospective study. It would be expected that a number of human factors, such as past experience of patient suicide, stress, fatigue, workload, countertransference, and time pressures, can all differentially influence a provider's rating of suicide risk. Variability in the type of training in suicide risk assessment received by any individual provider, as well as years of experience and supervision in conducting suicide risk assessments, may have also contributed to the findings. A qualitative difference in the way expert and novice practitioners approach suicide risk assessment is also to be expected.

As there is no available information for interrater reliability on the use of the PVAMC Comprehensive Suicide Risk Assessment screening tool, it is possible that final ratings may reflect more subjective, intuitive decision making on the part of the provider, rather than the empirical research on which this measure was developed. It is also not known how many, if any, of the ED mental health professionals used the PVAMC Comprehensive Suicide Risk Assessment screening tool to inform their decision making or if they simply indicated the factors post hoc.

Another possible limitation to be considered is that many of the veterans who present to the ED and endorse suicidal ideation may be engaging in help-seeking behaviors and may be likely to overreport and/or exaggerate pathology in an effort to obtain secondary gain. Although ED mental health professionals are required to record their assessments of such behaviors in the protective factors section of the PVAMC

Comprehensive Suicide Risk Assessment, it is often difficult to determine the veracity of veterans' self-report because collateral information is not always available.

The demographic composition of this urban veteran population had a slight majority of African American males, which may explain why they were overrepresented in deaths by suicide. It is quite possible that these findings would not generalize to veterans living in nonurban geographic areas. Given that the overwhelming majority of veterans do not use VHA services, the subjects of this program might very well be considered to be a sample of convenience, thereby inherently limiting the generalizability of the findings to the veteran population at large. In spite of these limitations, the retrospective nature of this program evaluation reflects naturalistic reasoning processes in suicide risk assessment as often conducted in emergency department settings where veterans seek VHA services. As such, unconstrained, idiosyncratic decision making may enhance the ecological validity of the findings of this program evaluation.

Finally, an issue that is problematic to all research related to suicide is the low base rate of such behaviors. Such was the case in the current program evaluation, given that only a small percentage of this veteran cohort engaged in SDV subsequent to receiving a suicide risk assessment in the ED, which of course, necessarily limits the statistical power for two of the hypotheses and the regression analysis.

Future research.

The findings of this program evaluation are robust enough to warrant a follow up study that incorporates all similar data at VA medical centers nationally. Replication of this program evaluation could assist in determining whether such findings are generalizable to rural populations. It may be instructive and useful to analyze similar ED data within the context of utilizing a two-dimensional risk stratification system whereby

both acute and chronic risk are assessed because this may lead to better understanding and identification those who may most benefit from longer term suicide prevention services that are currently being provided to veterans.

The use of qualitative methodological approaches could prove to be quite beneficial in terms of understanding the human dimensions of the statistical findings obtained by this program evaluation. By conducting interviews with mental health professionals who regularly conduct suicide risk assessments as part of their duties, we may be able to better understand the relevance of current theories on clinical judgment and decision making to the practical task of suicide risk assessment. The findings of such studies could prove to be very valuable in the training and development of best practice guidelines for mental health professionals and could focus on developing an awareness of the common, cognitively mediated decision-making pitfalls that are to be avoided in stressful clinical environments with a high potential for catastrophic outcomes.

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Appendix**PVAMC Comprehensive Suicide Risk Assessment**

Suicide ideation, threat, self-harm now or within 30 days:

- Patient has no suicidal ideation
- Patient has suicidal ideation or threat of self-harm
- Patient has made a suicide attempt or gesture in the past 30 days

Risk factors identified:

- None
- Prior suicide attempt (lifetime)
- Hopelessness
- Current severe psychiatric disorder including substance abuse
- Command hallucinations to hurt self
- Highly impulsive behavior
- Agitation or severe agitation
- Perceived burden on family or others
- Chronic physical pain or other acute medical problems (AIDS, COPD, Cancer, etc.)
- Homicidal ideation
- Aggressive behavior towards others
- Method for suicide available (guns, pills, etc.)
- Refuses or feels unable to agree to safety plan

- Significant recent losses (financial, employment, significant others, etc.)

Protective factors identified:

- None
- Identifies reasons for living
- Responsibility to family or others; living with family
- Supportive social network or family
- Fear of death or dying due to pain and suffering
- Belief that suicide is immoral; high spirituality
- Engaged in work or school
- Motivated to exaggerate suicide risk

Estimate risk level:

- High, with recent attempt (Suicide Prevention Coordinator notified)
- High, with no attempt (Suicide Prevention Coordinator notified)
- Moderate
- Low

Treatment planning:

- Low risk with no active suicidal ideation - patient given number for hotline. No additional suicide prevention measures warranted at this time
- Patient admitted to the hospital as the life safety plan
- Outpatient plan:
 1. Develop an outpatient safety plan required for high risk patients

2. Medication changes
3. Contact with caretakers
4. Address risk factors (especially access to means)
5. Strengthen protective factors
6. Add cognitive behavioral therapy
7. Other: