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# Suicide Risk Assessment Received Prior to Suicide Death by Veterans Health Administration Patients with a History of Depression

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## Abstract

**Objective—**To examine the quality of suicide risk assessment provided to veterans with a history of depression who died by suicide between 1999-2004.

**Methods—**Case-control study of suicide risk assessment information recorded in 488 medical charts of veterans previously diagnosed with Major Depression, Depression NOS, Dysthymia, or other, less common depression codes. Patients dying of suicide or comparison patients (n=244 pairs) were matched for age, sex, entry-year, and region.

**Results—**74% of patients with a history of depression received a documented assessment of suicidal ideation within the past year, and 59% received more than one assessment. However, 70% of patients of those who died of suicide did not have a documented assessment for suicidal ideation at their final VHA visit, even if that visit occurred within 0-7 days prior to suicide death. Most patients dying by suicide denied suicidal ideation when assessed (85%, 95% CI 75%-92%), even just 0-7 days prior to suicide death (73%, 95% CI 39%-94%). Suicidal ideation was assessed more frequently during outpatient final visits with mental health providers (60%) than during final visits with primary care (13%) or other non-mental health providers (10%) ($p<0.0001$).

**Conclusions—**Most VHA patients with a history of depression received some suicide risk assessment within the past year, but suicide risk assessments were infrequently administered at the final visit of patients who eventually died by suicide. Among patients who had assessments, denial

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of suicidal ideation appeared to be of limited value. Practice changes are needed to improve suicide risk assessment among patients with histories of depression, including the development of assessment and prevention strategies that are less dependent on the presence or disclosure of suicidal ideation at scheduled medical visits.

## Introduction

Visits with patients who have current or recent depressive disorders provide an opportunity for clinicians to assess their risk for suicidal behavior and to implement interventions to enhance safety. Such interventions may include providing quality care for their depressive disorders, referring patients to higher levels of care when needed (e.g., specialty mental health services or hospitalization), or other measures to enhance safety (e.g., safety planning or reducing access to means).

Unfortunately, some patients die by suicide soon after a clinician visit. Approximately 45% of persons dying by suicide visited a primary care provider and 19% visited a mental health provider within one month of suicide.[1] In the Veterans Health Administration (VHA), approximately 51% of patients with a history of depression who die by suicide have seen a VHA provider in the last month.[2]

Thus, the final visit prior to suicide represents the last opportunity for a clinician to appropriately assess suicide risk and potentially intervene to avoid this tragic outcome. To date, relatively few studies have examined what transpires during these final visits.[3-6] These limited findings indicate that only a minority of patients who die by suicide are assessed for suicidal ideation at their final visit (findings range from 16%[5] to 38%[4]), and among those assessed, most (>70%) deny suicidal ideation.[3, 5, 7] However, these studies examined the assessment received by a broad sample of patients dying by suicide, rather than a more specific “high-risk” group.

In this study, we focus on the high-risk group of patients previously diagnosed with depression. We also examine in greater detail than previous studies the extent of suicide risk assessment administered by clinicians at the final visit before suicide, and the interventions that clinicians implemented (e.g., safety planning, means assessment) or considered (e.g., hospitalization). Our secondary objectives included evaluating whether the occurrence of a documented clinician-administered suicide risk assessment varied by provider type (mental health versus non-mental health provider) or depended upon whether the visit occurred shortly before suicide. Lastly, we examined the rates of endorsement of suicidal ideation and planning during these final health care visits by patients who later died by suicide.

## Method

### Data Sources

We conducted a nested case-control study using the Veteran’s Health Administration’s (VHA) National Registry for Depression (NARDEP),[8] an extensive patient care database of over 2.2 million patients diagnosed with depressive disorders in VHA facilities maintained by the VHA Serious Mental Illness Treatment Resource and Evaluation Center (SMITREC)

in Ann Arbor, Michigan. NARDEP includes patient demographic and utilization information from fiscal year 1997 forward, and medication information from fiscal year 1999 forward. These data were linked to data from the National Death Index (NDI), which provides information on all causes of death, including suicide. The study was conducted with institutional review board approval from the Veterans Affairs Health System.

Patients were identified from the larger NARDEP cohort who had received either two diagnoses of depression or a diagnosis of depression plus an antidepressant prescription. Diagnosis of depression was defined by having an administratively recorded ICD-9 diagnostic code of 296.2×, 296.3×, 298.0, 300.4, 309.0, 309.1, 311, 296.90, 296.99, 293.83, or 301.12. In addition, we excluded patients with bipolar I, schizophrenia, or schizoaffective diagnoses. From the 1,892 VHA patients meeting these criteria who died from suicide during fiscal years 1999-2004, a sample who had a VHA visit during the study period was randomly selected and stratified by year of entry into the depression cohort, gender, and geographic region (of the patient's VHA facility of most use). Because of the small number of females in the VHA who died from suicide (2.9% of the suicides with a history of depression), all female cases were included (an approximately 3.8-fold oversampling). For each patient dying of suicide, a 1:1 match was performed with a randomly-selected comparison patient alive on the date of suicide death (index date), meeting inclusion criteria, and of the same stratum and age (+/− 5 years). This resulted in 244 age-, gender-, region-, and entry year-matched pairs whose charts were abstracted for this analysis.

**Administrative Data—**The NARDEP data files were used to supply all demographic and diagnostic information. Diagnostic data variables were based on diagnostic codes using the International Classification of Diseases, Ninth Revision, clinical modification (ICD-9-CM)[9] recorded in any diagnosis field of inpatient or outpatient visits.

**Chart Information—**Information regarding suicide risk assessments was abstracted by chart review of the VHA electronic medical record. Data were abstracted regarding the assessment and documentation of suicidal ideation and planning, access to suicidal means, and clinical actions considered or performed (consideration of hospitalization or the conduct of safety planning). All notes for the 365 days preceding suicide death/index date were reviewed by chart abstractors with the aid of a previously-validated electronic medical record search engine (EMERSE).[10] EMERSE highlights words in pre-defined search bundles. Search bundles were developed, pilot-tested and refined for each variable to broadly capture all the notations related to the specific conditions (i.e., "suicide attempt" or "hurt" for the suicide attempt variable). Each of four chart abstractors received training to improve the accuracy of the chart review; however, 92% of study patients were reviewed by one reviewer (C.S.). If a patient saw multiple providers on their final day of VHA contact, a patient was scored as "assessed for suicidal ideation" if any notes from that day discussed the presence or absence of suicidal ideation. Documented telephone encounters with providers were considered to be the final encounter if these occurred after the last face-to-face visit.

### Data Analysis

Demographic and clinical characteristics, utilization patterns, and assessment rates for our matched samples (Tables 1, 2, and 3) were compared either by McNemar's test (dichotomous variables) or paired t-test (continuous variables). Our matched samples included subcohorts in which we stratified our sample based on suicide imminence (i.e., whether the suicide death among the patient dying by suicide occurred within 0-30 days of the final visit (n = 111 pairs) or within 0-7 days (n=43 pairs)). Exact 95% confidence intervals were derived for the proportion of patients denying suicidal ideation.

For our analysis of suicidal ideation assessment rates by provider specialty (mental health or non-mental health), we restricted our investigation to outpatient final visits. This was to avoid biasing our comparison by location of care, given that more patients receiving mental health provider evaluations were either inpatients or had telephone final visits. Fisher's exact test was used to determine statistical significance. For our analyses restricting the sample only to patients with either a current diagnosis of depression or antidepressant use, qualifying diagnoses of depression were required to be given on the day of last visit and were limited to a diagnosis of major depressive disorder or Depression NOS (not otherwise specified) to limit any effects of diagnostic heterogeneity. Current antidepressant use was defined as the patient having an antidepressant prescription with a days supply that included the date of the last visit.

All analyses were carried out using SAS, version 9.3 (SAS Institute; Cary, North Carolina, USA).

## Results

Table 1 lists the demographic and clinical characteristics of our matched sample. Individuals who died by suicide were more likely to receive VHA mental health care, be discharged from a mental health inpatient stay, and be diagnosed with a mental health condition at their final visit.

VHA patients who died by suicide were also more likely to have received a suicide risk assessment within the year prior to suicide: almost three-quarters (74%) received at least one assessment of whether they were experiencing suicidal ideation (Table 2A). This proportion was significantly different than the rate of assessment for suicidal ideation (60%) for comparison patients not dying by suicide ($p = 0.0009$). A majority of patients dying by suicide (59%) received more than one assessment of suicidal ideation in the year prior to suicide (versus 41% of comparison patients, $p < 0.0001$) (Table 2A). 42% of patients dying by suicide also received at least one assessment of whether they had a plan for suicide, and 25% had their access to suicidal means assessed (Table 2A). Among patients only seen by non-mental health services over this period, rates of assessment among patients dying by suicide were substantially lower for all of these measures, and no statistically significant differences with comparison patients were noted except for the consideration of hospitalization (Table 2B).

While overall assessment rates over the previous year are of interest, particularly for interventions less dependent on timing for their value (e.g., discussion of access to means), of particular interest for this study is how likely assessments were to occur when the need for them might be particularly great: during the final VHA visit for each patient before suicide. Table 3 indicates that 70% of patients with a history of depression who died by suicide did not have an assessment of suicidal ideation documented in their chart at their final visit prior to suicide. Patients who died by suicide did have somewhat higher documented assessment rates for suicidal ideation than comparison patients (30% versus 20%, p=0.01). Assessment for suicidal planning was infrequent, but also differed for patients dying by suicide (7%) versus comparison patients (3%) (p=0.02).

Safety planning at final visit occurred infrequently but differed for patients dying by suicide (5%) versus comparison patients (1%) (p=0.01), whereas assessment of access to means or consideration of hospitalization were similarly infrequent, and not significantly different between patients dying by suicide and comparison patients. Of further note, 85% (95% CI 75%-92%) of patients dying by suicide in our cohort who received an assessment denied suicidal ideation at their final visit (Table 3).

Rates of assessment for suicidal ideation at final visit did increase significantly when the sample was restricted to the approximately two-thirds of the sample with the clearest indication of possible depression on that date (i.e., having either a depression diagnosis or antidepressant use extending to the final visit). Rates of assessment at final visit among patients dying by suicide with current depression or treatment increased significantly to 40.1% (p<0.0001), and among comparison patients to 26.1% (p=0.0012), compared to rates for patients without a depression diagnosis or active antidepressant treatment at the last visit.

We investigated whether rates of suicidal ideation assessment differed for patients receiving substance abuse treatment or with comorbid PTSD. Patients receiving substance abuse treatment at their final visit subsequently dying by suicide were only half as likely to receive an assessment of suicidal ideation (33%) than other patients dying by suicide seen by mental health providers at final visit (67%), although likely due to small numbers this finding was not statistically significant (p=0.07). No difference in rates of assessment for suicidal ideation was noted among patients with a comorbid PTSD diagnosis in the past year.

The pattern of greater assessment rates for patients seen by mental health providers (Table 2A compared to Table 2B) over the past year was borne out strongly during the final visit before suicide: 60% of patients dying by suicide seen by mental health outpatient providers at their final visit were assessed for suicidal ideation versus only 13% seen by primary care providers and 10% by other outpatient non-mental health providers (p<0.0001) (Table 4A). A similar proportion of comparison patients (57%) last seen by mental health providers received a suicidal ideation assessment (Table 4B).

Since non-mental health providers may understandably focus on other problems if depression does not seem to be a current issue, we also examined rates of assessment by provider after removing patients without a current depression diagnosis or antidepressant use. Rates of assessment for suicidal ideation at final visit among patients dying by suicide

did increase, but only slightly: 68% of patients with current depression seen by mental health outpatient providers were assessed for suicidal ideation, versus 17% of patients seen by primary care providers and 15% seen by other outpatient non-mental health providers ($p<0.0001$).

Table 5 examines whether assessment rates depended on how close in time the final visit was to suicide death. Patients seen close to suicide death (i.e., within 7 or 30 days) might plausibly be exhibiting visible symptoms or behaviors or reporting stressors at a higher rate than patients seen more remotely, possibly prompting providers to assess suicide risk. However, similar to the full cohort, ≤30% of patients dying by suicide were assessed for suicidal ideation at their final visit in either of these subsamples.

Table 5 also indicates that even among patients who died by suicide in the next 7 or 30 days, denial of suicidal ideation was the norm, not the exception. For example, 73% (95% CI 39%-94%) of those who were assessed and died from suicide within 7 days of their final visit denied suicidal ideation.

## Discussion

While other VHA[5] and non-VHA[3, 4, 11] chart review studies have examined the rates of assessment of suicidal ideation among patients who died by suicide, our study is distinctive in its use of matched comparisons, examination of assessments occurring close to suicide death, and comparison of mental health and non-mental health providers. We observed that rates of assessment for suicidal ideation in the final visit prior to suicide are generally low (≤30%), consistent with previous findings[3-5] even though our study specifically examined patients with current or previously diagnosed depression. Such patients may be particularly in need of more regular or more easily-triggered suicide assessments. Our findings are consistent with our prior study which observed that veterans with a history of depression were not likely to receive mental health diagnoses or optimal antidepressant treatment at their final visit before suicide.[2]

Assessment rates were no higher for patients seen shortly before suicide death: the majority (>70%) of patients who died of suicide failed to receive an assessment of suicidal ideation at their final visit, even if seen within 0-7 days of suicide. A far stronger influence than timing upon whether a patient received an assessment of suicidal ideation appeared to be whether their final visit occurred with mental health services. However, this increased assessment rate may have been primarily driven by higher rates of mental health providers routinely assessing suicidal ideation among patients with histories of depression (since assessment rates for patients last seen by mental health providers were virtually identical among patients dying by suicide [60%] and comparison patients [57%]), rather than any particular ability of mental health providers to discern who might most need assessment. Even among patients last seen by mental health services, 40% were not assessed for suicidal ideation during the final visit before suicide.

At least three broad strategies could be envisioned based upon our findings: 1) enhancing the use of less time- and visit-sensitive approaches to suicide risk reduction, such as safety

planning, means restriction, and crisis helplines; 2) developing expectations and/or means to refer as many patients reporting suicidal ideation as feasible to mental health services, to take advantage of the higher rates of assessment occurring in that setting; and 3) decreasing the burden and increasing the routinization of suicide risk assessments, this strategy has been suggested[12] and implemented[13] in a few locations using self-report depression rating scales that include a suicidal ideation item. There likely is value in each of these approaches, and the VHA has taken action since the close of our study period (2004) in each of these areas.

Decisions concerning the value and drawbacks of strategies that increase the frequency of assessments of suicidal ideation are complex; several authors have written cogently on the potential limited yield of such a strategy, especially for general medical settings, given the high level of positive screens expected relative to suicide deaths and attempts.[14, 15] Our findings further help illustrate why such efforts are challenging. Our data suggest that determining when to assess a patient for suicidal ideation is difficult, and, as others have also found,[7] there is a substantial likelihood for a negative response, even from someone who may shortly die from suicide. There is also a growing literature suggesting that crises associated with suicidal actions often have highly rapid onset. For example, near-lethal suicide attempts often occur on the same day as the crises associated with the attempt,[16, 17] and surveys have found up to 43% of suicide attempts were “unplanned.”[18]

Despite these challenges, additional considerations support more routine suicide risk screening, at least in mental health settings. First, it can be argued that few activities mental health practitioners engage in are potentially of greater importance to the health and safety of their patients, even if screening is inefficient. Second, mental health providers routinely have more time to dedicate to mental health per encounter, creating time to conduct such screens and discuss their results. Routine assessments may also help “destigmatize” reporting suicidal ideation, and empower patients to address this symptom of depression, even should it occur between sessions. Lastly, suicidality is one of the core criteria of major depressive episodes; thus it is difficult to fully assess the condition of patients with current or recent depression without asking about it. Clearly, however, these considerations change substantially in the non-mental health setting, where time spent on suicide risk screening could take time away from addressing patients’ other health concerns.

Regardless of one’s viewpoint concerning the value of suicide risk screening, our data supports broader, less time- and visit-sensitive approaches to suicide prevention such as means restriction and safety planning. These approaches were relatively unused during our study period, but are at the core of recent VHA practice changes. Since 2007, the VHA has enacted a suite of suicide prevention initiatives designed to both enhance care access and emphasize approaches that have value independent of a clinician visit, including safety planning, means restriction, and a highly -publicized 24- hour telephone hotline (the “Veterans Crisis Line”).[19] Safety planning occurs jointly between clinicians and “high-risk” patients to develop personalized strategies that patients can employ in between visits in response to the re-emergence or intensification of suicidal ideation. These recent VHA initiatives would be specifically expected to improve the low rates of safety planning and assessment of access to means observed in this study, which ended prior to the start of these

initiatives. The VHA also mandates flagging of patients judged at high risk for suicide in the medical record so all providers view information announcing their high-risk status at each VHA visit.

Of note, patients dying by suicide were more likely to endorse suicidal ideation at some point in the past year than at final visit (62% [Table 2A] versus 30% [Table 3], $p<0.0001$). This observation parallels previous research findings that suicidal ideation at its worst point during a patient's lifetime is more predictive of suicide than current ideation.[20] Future research might investigate whether suicide risk assessments could be improved by also gathering information about worst lifetime suicidal ideation, or whether patients with prior, but not current, suicidal ideation or plans should still receive interventions intended to reduce suicide risk (e.g., safety planning and means restriction).

Important limitations to our study exist. Our study is restricted to assessments documented in the chart. Providers might have assessed some patients but neglected to record the assessment, or forgotten to assess a patient but recorded language that the patient lacked suicidal ideation (either from habit or due to risk management concerns). Given the low rates of assessment we observed generally, we suspect any bias for overreporting assessments is small, except possibly among mental health providers. For inpatient care, we chose to consider only documented assessments occurring on date of discharge as the "final visit." Assessments may often have occurred at other times during the inpatient stay; however, it may be particularly important to reassess suicidal thinking immediately prior to discharge. Lastly, our case-control design, often standard in studies of rare events and essential here to efficiently target charts for abstraction, describes what occurred when suicide deaths were not averted, but does not detect instances in which high-risk individuals received assessments/interventions that averted suicide.[3] Modified or different study designs would be needed to detect these events of effective assessment or intervention.

Because our study focuses upon patients with a history of depression, some instances of non-assessment may simply reflect the provider (possibly in error) no longer viewing depression as a treatment priority. However, a subanalysis indicated that a lack of assessment for suicidal ideation at the final visit is still common among patients with current depression or antidepressant use (almost 60% of these patients dying by suicide were not assessed).

Because of the labor required to conduct the extensive chart review, only a small fraction of the patients with a history of depression dying or not dying by suicide could receive review. A matched, case-control design was thus chosen to increase efficiency, i.e., increase the likelihood that patients dying by suicide and comparison patients were comparable with respect to major demographic (age and sex) and system-level factors (geographic region and dates of assessment) that might influence likelihood of assessment. Such matching introduces bias by design, intended to counterbalance confounding bias from imbalances in these key factors between cases and comparison patients.[21] Thus, it is possible our case-control design attenuates some differences in absolute rates of assessment between cases and controls in favor of presenting what are intended to be less confounded rates of assessment. More serious biases can result if factors used for matching are not associated with exposure,

or especially outcome. We examined one factor used for matching, age, and observed that rates of assessment for suicidal ideation at final visit did vary strongly by age (34% at final visit for patients <65 years old versus 21% for patients ≥ 65 years old, p=0.05). In previous work on this matched cohort, we reported that age was significantly related to suicide risk,[22] thus supporting the rationale for matching. Lastly, only part of the value of our study is provided by the comparison between patients dying of suicide and comparison patients; examining simply the assessment rates just among patients dying by suicide also has value.

In conclusion, in a comparison of matched patients with depressive disorders who died or did not die from suicide, we observed low rates of assessment for suicidal ideation, planning, or access to means at their final visit, regardless of whether a patient ultimately went on to die by suicide or the timing of the final visit prior to suicide death. Instead, we observed that whether the final visit occurred with a mental health provider had a much bigger impact on the likelihood on whether an assessment for suicidal ideation occurred. However, even a substantial number of patients seen by mental health providers did not receive an assessment of suicidal ideation at their final visit. Adding to the challenge of clinician-based suicide risk assessment, we also observed that a sizeable majority of patients denied suicidal ideation, even among those who would subsequently die within a few days from suicide. These findings particularly suggest that clinically-based suicide risk assessment and prevention strategies need to go beyond simple reliance on patient endorsement of suicidal ideation.

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TABLE 1

**Patient Characteristics**

| Characteristic | Patients Dying by Suicide (n=244) N | % | Matched Comparison Patients[a] (n=244) N | % | P Value[b] |
|---|---|---|---|---|---|
| Gender (Male) | 214 | 87.7 | 214 | 87.7 | 1.0 |
| Race (White) | 206 | 84.4 | 195 | 79.9 | 0.19 |
| Ethnicity (non-Hispanic) | 238 | 97.5 | 232 | 95.1 | 0.16 |
| Disability (≥50% Service Connection) | 41 | 16.8 | 56 | 23.0 | 0.09 |
| Final Visit Provider/Setting | | | | | |
| Mental Health Provider | 93 | 38.1 | 61 | 25.0 | 0.001 |
| Inpatient (Mental Health)[c] | 19 | 7.8 | 1 | 0.4 | <.0001 |
| Inpatient (Non-Mental Health) | 4 | 1.6 | 4 | 1.6 | 1.0 |
| Phone Encounter | 12 | 4.9 | 6 | 2.5 | 0.16 |
| Diagnoses at Final Visit | | | | | |
| Any MH Diagnosis | 103 | 42.2 | 76 | 31.1 | 0.01 |
| Depression Diagnosis | 82 | 33.6 | 66 | 27.0 | 0.12 |
| | Mean | SD | Mean | SD | |
| Age | 57.2 | 13.9 | 57.2 | 13.8 | 0.87 |
| Recency of Final Visit (days before index date[d]) | 63.3 | 74.1 | 58.4 | 75.8 | 0.49 |

[a] Matched for age, sex, gender, year of entry into the cohort, and region of the country.

[b] All p-values are based on paired data analysis (McNemar's test or paired t-test).

[c] Of these, 58% were diagnosed with depression or a suicide attempt.

[d] Date of suicide death or, for matched comparison patients, date of suicide death in paired case.

## TABLE 2

**A. Suicide Risk Assessment and Provider Actions During the Year Prior to Suicide**

| Provider Action | Patients Dying by Suicide (n=244) | | Matched Comparison Patients (n=244) | | Number of Discordant Pairs[a] | P value[b] |
|---|---|---|---|---|---|---|
| | N | % | N | % | N/N | |
| Suicidal Ideation Assessed | 181 | 74.2 | 147 | 60.2 | 69/35 | 0.0009 |
| Suicidal Ideation Endorsed (among Assessed Patients) | 113 (*of 181*) | 62.4 | 28 (*of 147*) | 19.0 | NA-unmatched | < 0.0001 |
| Suicidal Plan Assessed | 102 | 41.8 | 44 | 18.0 | 80/22 | < 0.0001 |
| Suicidal Plan Endorsed (among Assessed Patients) | 60 (*of 102*) | 58.8 | 6 (*of 44*) | 13.6 | NA-unmatched | < 0.0001 |
| Access to Means Assessed[c] | 60 | 24.6 | 15 | 6.2 | 55/11 | < 0.0001 |
| Hospitalization Considered[d] | 91 | 41.2 | 17 | 7.7 | 76/6 | < 0.0001 |
| Received More than One Assessment of Suicidal Ideation in Past Year | 144 | 59.0 | 100 | 41.0 | 81/37 | < 0.0001 |

**B. Suicide Risk Assessment and Provider Actions during the Year Prior to Suicide for Patients with No Mental Health Visits during that year**

| Provider Action | Patients Dying by Suicide (n=69) | | Matched Comparison Patients (n=97) | | P value[b] |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Suicidal Ideation Assessed | 24 | 34.8 | 31 | 32.0 | 0.74 |
| Suicidal Ideation Endorsed (among Assessed Patients) | 8 (*of 24*) | 33.3 | 6 (*of 31*) | 19.4 | 0.35 |
| Suicidal Plan Assessed | 7 | 10.1 | 6 | 6.2 | 0.39 |
| Suicidal Plan Endorsed (among Assessed Patients) | 4 (*of 7*) | 57.1 | 3 (*of 6*) | 50.0 | 1.00 |
| Access to Means Assessed | 5 | 7.3 | 3 | 3.1 | 0.28 |
| Hospitalization Considered[e] | 5 | 9.1 | 1 | 1.2 | 0.034 |

**B. Suicide Risk Assessment and Provider Actions during the Year Prior to Suicide for Patients with No Mental Health Visits during that year**

| Provider Action | Patients Dying by Suicide (n=69) | | Matched Comparison Patients (n=97) | | P value[b] |
|---|---|---|---|---|---|
| | N | % | N | % | |
| Received More than One Assessment of Suicidal Ideation in the Past Year | 10 | 14.5 | 9 | 9.3 | 0.33 |

[a] Discordant pairs reported as Number of matched pairs in which Patient Dying by Suicide Assessed (or Action taken) but Comparison patient not assessed (or no action)/Number of matched pairs in which Patient Dying by Suicide Not Assessed (or No Action Taken) but Comparison Patient Assessed (or Action taken).

[b] For Table 2A, All p-values are from McNemar's test except for Suicidal Ideation endorsed and Suicidal plan endorsed, for which matched pairs were not preserved (Fisher's exact test used). For Table 2B, all p values based on Fisher's exact test (and no discordant pairs reported, since matched pairs were not used in the analyses).

[c] Assessment of Access to Means missing for 1 comparison subject (and 1 matched pair).

[d] Information concerning consideration of hospitalization missing for 23 patients dying by suicide and 24 comparison patients (and 43 matched pairs).

[e] Information concerning consideration of hospitalization missing for 14 patients dying by suicide and 11 comparison patients.

**TABLE 3**

**Suicide Risk Assessment and Provider Actions at the Final VHA Visit**

| Provider Action | Patients Dying by Suicide (n=244) | | Matched Comparison Patients (n=244) | | Number of Discordant Pairs[a] | P value[b] |
|---|---|---|---|---|---|---|
| | N | % | N | % | N / N | |
| Suicidal Ideation Assessed | 73[d] | 29.9[d] | 49[d] | 20.1[d] | 57/33 | 0.01 |
| Suicidal Ideation Endorsed (among Assessed Patients) | 11 (*of 73*) | 15.1 | 2 (*of 49*) | 4.1 | 11/2 | 0.07[c] |
| Suicidal Plan Assessed | 17 | 7.0 | 6 | 2.5 | 17/6 | 0.02 |
| Suicidal Plan Endorsed (among Assessed Patients) | 4 (*of 17*) | 23.5 | 0 (*of 6*) | 0 | 4/0 | 0.54[c] |
| Safety Planning conducted | 13 | 5.3 | 3 | 1.2 | 13/3 | 0.01 |
| Access to Means Assessed | 6 | 2.5 | 3 | 1.2 | 6/3 | 0.32 |
| Hospitalization Considered | 3 | 1.4[e] | 1 | 0.4[e] | 3/1 | 0.32 |

[a] Discordant pairs reported as Number of matched pairs in which Patient Dying by Suicide Assessed (or Action taken) but Comparison patient not assessed (or no action)/Number of matched pairs in which Patient Dying by Suicide Not Assessed (or No Action Taken) but Comparison Patient Assessed (or Action taken).

[b] All p-values are from McNemar's test except where noted.

[c] p-values based on Fisher's exact test.

[d] Counts and rates of assessment of suicidal ideation for subsample restricted to the 157 patients dying by suicide and the 161 comparison patients with a current depression diagnosis (Major Depression or Depression NOS) or current antidepressant use at final visit are: 63 patients, 40.1% (patients dying by suicide) and 42 patients, 26.1% (comparison patients). Both rates are statistically different at p=0.0012 or less from the rates for patients without current diagnoses or antidepressant use. P value for the comparison between patients dying by suicide and comparison patients equals 0.009 (Fisher's exact test).

[e] Does not include the 22 patients dying by suicide and 5 comparison patients who were inpatient at the time of their last final assessment, since they were already hospitalized.

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## TABLE 4

**A. Rates of Suicide Assessment during Outpatient Final Visits by Provider Specialty**

| | Patients Dying by Suicide[a] | | | | | | |
|---|---|---|---|---|---|---|---|
| **Provider Action** | **Final Visit with Mental Health Provider (n=68)** | | **Final Visit with Primary Care Provider (n=84)** | | **Final Visit with Other Non-Mental Health Provider (n=59)** | | **P Value[e]** |
| | **N** | **%** | **N** | **%** | **N** | **%** | |
| Assessed for Suicidal Ideation | 41 | 60.3 | 11 | 13.1 | 6 | 10.2 | <0.0001 |
| | **Comparison Patients[b]** | | | | | | |
| | Final Visit with Mental Health Provider (n=60) | | Final Visit with Primary Care Provider (n=86) | | Final Visit with Other Non-Mental Health Provider (n=86) | | P Value[e] |
| | N | % | N | % | N | % | |
| Assessed for Suicidal Ideation | 34 | 56.7 | 7 | 8.1 | 4 | 4.7 | <.0001 |

**B. Rates of Suicide Assessment during Outpatient Final Visits by Provider Specialty Among Patients with Current Depression Diagnosis or Antidepressant Use**

| | Patients Dying by Suicide[c] | | | | | | |
|---|---|---|---|---|---|---|---|
| Provider Action | Final Visit with Mental Health Provider (n=53) | | Final Visit with Primary Care Provider (n=48) | | Final Visit with Other Non-Mental Health Provider (n=27) | | P Value[e] |
| | N | % | N | % | N | % | |
| Assessed for Suicidal Ideation | 36 | 67.9 | 8 | 16.7 | 4 | 14.8 | <0.0001 |
| | **Comparison Patients[d]** | | | | | | |
| | Final Visit with Mental Health Provider (n=49) | | Final Visit with Primary Care Provider (n=54) | | Final Visit with Other Non-Mental Health Provider | | P Value[e] |

**A. Rates of Suicide Assessment during Outpatient Final Visits by Provider Specialty**

| | Patients Dying by Suicide[a] | | | | | | |
|---|---|---|---|---|---|---|---|
| **Provider Action** | **Final Visit with Mental Health Provider (n=68)** | | **Final Visit with Primary Care Provider (n=84)** | | **Final Visit with Other Non-Mental Health Provider (n=59)** | | **P Value[e]** |
| | **N** | **%** | **N** | **%** | **N** | **%** | |
| | N | % | N | % | (n=49) N | % | |
| Assessed for Suicidal Ideation | 31 | 63.3 | 5 | 9.3 | 3 | 6.1 | <0.0001 |

[a] Visit location missing for 9 patients dying by suicide.

[b] Visit location missing for 6 comparison patients.

[c] Visit location missing for 6 patients dying by suicide.

[d] Visit location missing for 4 comparison patients.

[e] P values based on 2 × 3 chi-square test. Because matched pairs were not preserved for the analyses by provider type, no discordant pairs are reported.

**Table 5**

**Suicide Risk Assessment and Provider Actions for Patients Seen Shortly Before Suicide Death and their Matched Comparisons**

| Provider Action | Dying by Suicide within 30d of Final Visit (n= 111 pairs) | | | | | Dying by Suicide within 7d of Final Visit (n=43 pairs) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dying by Suicide | | Comparison Patients | | P Value[a] | Dying by Suicide | | Comparison Patients | | P Value[a] |
| | N | % | N | % | | N | % | N | % | |
| Suicidal Ideation Assessed | 33 | 29.7 | 17 | 15.3 | 0.006[b] | 11 | 25.6 | 9 | 20.9 | 0.53[b] |
| Suicidal Ideation Endorsed (among Assessed Patients) | 9 (*of 33*) | 27.3 | 1 (*of 17*) | 5.9 | 0.13[c] | 3 (*of 11*) | 27.3 | 0 | 0 | 0.22[c] |
| Suicidal Plan Assessed | 11 | 9.9 | 2 | 1.8 | 0.01 | 4 | 9.3 | 0 | 0 | NA |
| Suicidal Plan Endorsed (among Assessed Patients) | 4 (*of 11*) | 36.4 | 0 (*of 2*) | 0 | 1.00[c] | 3 (*of 4*) | 75.0 | 0 | 0 | NA[c] |
| Safety Planning Conducted | 8 | 7.2 | 1 | 0.9 | 0.02 | 2 | 4.7 | 0 | 0.0 | NA |
| Access to Means Assessed | 5 | 4.5 | 1 | 0.9 | 0.10 | 3 | 7.0 | 0 | 0 | NA |
| Hospitalization Considered | 3 | 3.1[d] | 0 | 0.0 | NA | 1 | 2.8[e] | 0 | 0.0 | NA |

[a] All p-values are from McNemar's test except where noted.

[b] Discordant pairs for Suicidal Ideation Assessed totaled 25 patients dying of suicide and 9 comparison patients at 30 days and 6 patients dying by suicide and 4 comparison patients at 7 days. Proportions of Suicidal Plan Assessed, Safety Planning Conducted, Access to Means Assessed, and Hospitalization Considered were also analyzed as matched pairs; counts of discordant pairs equaled counts shown in table (i.e., no concordant pairs were observed).

[c] p-values based on Fisher's exact test.

[d] Does not include 14 patients dying by suicide and 2 comparison patients who were inpatient at the time of their last final assessment .

[e] Does not include 7 patients dying by suicide and 1 comparison patient who were inpatient at the time of their last final assessment.