

## National Patient Safety Goals

# A Checklist to Identify Inpatient Suicide Hazards in Veterans Affairs Hospitals

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Suicide is the 11th leading cause of death in the United States, resulting in the death of more than 33,000 people each year.<sup>1</sup> In 2006, 162,359 individuals were hospitalized for self-inflicted injuries, and in 2005, 372,722 people were treated in emergency departments for self-harm. Men take their lives at nearly four times the rate of women and represent 79.4% of all suicides.<sup>1</sup>

In 2003 the American Psychiatric Association reported that approximately 1,500 suicides take place in inpatient hospital units in the United States each year, and that one third of these take place while the patient is on 15-minute checks.<sup>2</sup> Dong, Ho, and Kan found an inpatient suicide rate of 269 suicides per 100,000 psychiatric admissions in Hong Kong,<sup>3</sup> and Shapiro and Waltzer<sup>4</sup> reported rates of between 5 and 80 per 100,000 psychiatric admissions in the United States. A review of inpatient suicides conducted by The Joint Commission found that 75% involved hanging and that another 20% resulted from patients jumping from a roof or window.<sup>5</sup> Other studies of inpatient suicide included patients who committed suicide while on pass or eloping from the hospital, so that it is difficult to discern the specific environment in which patients committed suicide<sup>6-8</sup>; however, all reported hanging and jumping to be the most common methods. A recent study of inpatient suicide in Department of Veterans Affairs (VA) hospitals also found that hanging was the most common method of inpatient suicide (accounting for 43% of all inpatient suicides) and that doors and wardrobe cabinets accounted for 41% of the anchor points used when hanging was the method of self-harm.<sup>9</sup>

Lambert and Fowler<sup>10</sup> described how veterans possess many of the common risk factors for suicide, and Kaplan et al.<sup>11</sup> reported that veterans in a community sample conducted before the Afghanistan and Iraqi wars were twice as likely as non-veterans to die of suicide. Kang and Bullman,<sup>12</sup> who examined the risk of suicide in veterans of the conflicts in Iraq and Afghanistan, found that although the overall risk for suicide among these veterans was not higher than would be expected in the population at large, it was higher for former active compo-

### Article-at-a-Glance

**Background:** Approximately 1,500 suicides take place in inpatient hospital units in the United States each year. This study, the first of its kind, examines the implementation and effectiveness of using a standardized checklist for mental health units to improve patient safety in a large health care system.

**Methods:** In 2006 a Department of Veterans Affairs (VA) committee was charged with developing a checklist to explicitly identify environmental hazards on acute mental health units treating suicidal patients. The committee developed both general guidelines to be applied to all areas of the psychiatric unit and detailed guidelines for specific rooms, such as bathrooms, bedrooms, and seclusion rooms.

**Results:** Some 113 VA facilities used the Mental Health Environment of Care Checklist to evaluate their mental health units, identifying and rating 7,642 hazards. At the end of the first year of the project, because of the checklist, 5,834 (76.3%) of these hazards had been abated by facilities; approximately 2% were identified as critical hazards, and another 27% were rated as serious. The most common hazard was anchor points for hanging, followed by material that could be used as a weapon against staff or other patients and problems keeping patients in the secured unit environment. Anchor points had the greatest risk-level classification, followed by suffocation risk and poison risk. High-risk locations included bedrooms and bathrooms.

**Discussion:** Anchor points represented almost 44% of the total number of identified hazards, and materials that could be used as weapons comprised nearly 14% of the total. It is critical to review the mental health environment of care with an eye for these potential weapons. The checklist and resulting mitigations of hazards represent steps toward the overall goal of preventing inpatient suicides.

ment service members (regular active duty military) and veterans diagnosed with some mental disorders, suggesting that suicide prevention in VA settings is a particular challenge.

Other studies have described the specific characteristics of patients who have committed suicide while in the hospital<sup>13-16</sup> or have analyzed environmental factors relevant to inpatient suicide or suicide attempts.<sup>2,5,9</sup> The Joint Commission's National Patient Safety Goal, in effect since 2007 for psychiatric hospitals and patients being treated for emotional or behavioral disorders in general hospitals, requires "a risk assessment that identifies specific patient characteristics and environmental features that may increase or decrease the risk for suicide" (NPSG.15.01.01, Element of Performance 1).<sup>17</sup>

This article describes the development and implementation of the Mental Health Environment of Care Checklist, which was designed to review the environment of care in mental health units in VA hospitals and identify environmental hazards associated with increased suicide risk. We chose to institute the use of a checklist so that those approaches and techniques that we identified to possess value could be standardized across all VA facilities. Unlike the general medical system in the United States, which is composed of thousands of independent hospitals developing idiosyncratic plans to manage risk, the VA has the advantage of being an integrated system in which systemwide strategies can be deployed across all hospitals in the system. The use of a checklist is an explicit effort to reduce ambiguity of communication and implementation to mitigate patient risk and improve care. The checklist was developed and deployed nationally in the VA hospital system in 2007-2008, and both the dissemination process and the results of using the checklist during a 12-month period are described.

## Methods

### DEVELOPING THE CHECKLIST

In Summer 2006, a confluence of two events occurred: The VA National Center for Patient Safety completed a review of all root cause analysis reports of inpatient suicides and serious suicide attempts<sup>9</sup> and the VA senior leadership recognized the need for greater national standardization in inpatient psychiatric units. Our study of reports of inpatient suicide between December 1999 and June 2006 found 42 completed suicides and 143 serious suicide attempts.<sup>9</sup> Consequently, an 18-member multidisciplinary committee was formed, which was charged with the task of developing a checklist to be used to identify environmental hazards on acute mental health units treating suicidal patients. Committee members included senior

Table 1. Risk-Level Classification Chart\*

Risk-Level Classification Chart				
Mishap Probability	A	B	C	D
Hazard Severity				
I	5	5	4	3
II	5	4	4	3
III	3	2	2	1
IV	2	2	1	1

Table Key: 5, critical; 4, serious; 3, moderate; 2, minor; 1, negligible.

\* **Hazard Severity:** I: "Catastrophic" (may cause death of a patient, staff, or visitor), II: "Critical" (may cause severe injury to patient, staff, or visitors or major property damage), III: "Marginal" (may cause minor injury to patient, staff, or visitors or minor property damage), and IV: "Negligible" (probably would not affect personal safety or health but is nevertheless in violation of Occupational Safety Health Administration, Department of Veterans Affairs, or a consensus standard). **Probability:** A: "Likely to occur immediately or within a short period of time," B: "Probably will occur in time," C: "May occur in time," or D: "Unlikely to occur." **Risk-Level Classification:** 5: Critical, 4: Serious, 3: Moderate, 2: Minor, 1: Negligible.

leaders and frontline staff in mental health, senior mental health nurses, and chief engineers and architects with experience in designing and building mental health units, as well as senior patient safety and fire safety personnel.

The committee developed both general guidelines to be applied to all areas of the psychiatric unit and detailed guidelines for specific rooms, such as bathrooms, bedrooms, and seclusion rooms. The criteria for the checklist were based on both the data collected from root cause analysis reports<sup>9</sup> and the extensive experience of the committee members. In addition, a second system was developed by the committee to rate each identified hazard for the level of risk on a scale of 1 to 5: "1" represented minimal risk and "5" represented critical risk requiring immediate abatement (Table 1, above). Critical (Level 5) hazards are capable of causing death or severe injury and are likely to occur in time. Serious (Level 4) hazards are capable of causing death or severe injury but are less likely to occur.

Drafts of the checklist were extensively pilot tested in VA hospitals during Spring and early Summer 2007 (Figure 1, page 89).

### Making the Checklist Mandatory

In August 2007, as a result of actions taken by VA leadership, use of the Mental Health Environment of Care Checklist (<http://www.patientsafety.gov/SafetyTopics.html>)<sup>18</sup> became mandatory in all VA mental health units treating suicidal patients. Every mental health unit in the VA system was required to form a multidisciplinary safety inspection team (MSIT), whose composition is shown in Table 2 (page 90), to

**Time Line of Development and Implementation of the Mental Health Environment of Care Checklist**

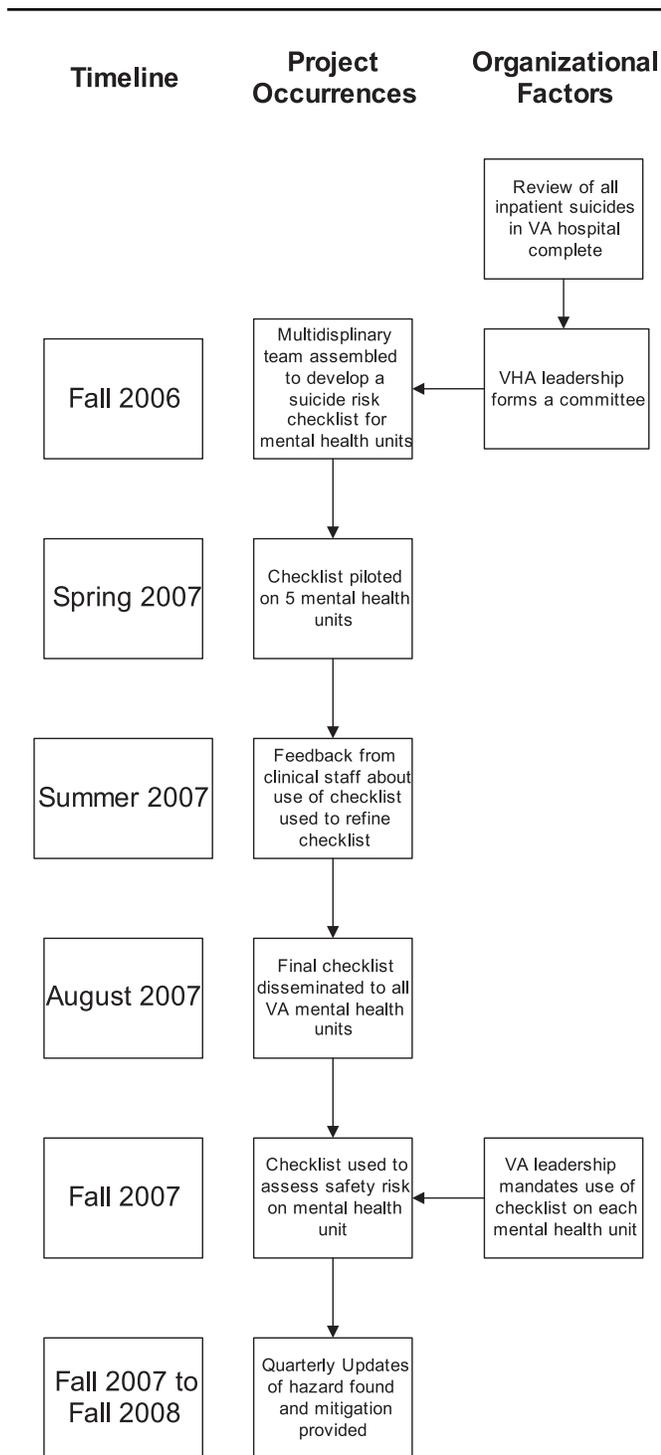


Figure 1. Project occurrences and organizational factors are shown in this time line for the checklist. VA, Department of Veterans Affairs.

review the unit on a quarterly basis. The teams were required to submit a list of all identified hazards, along with their plans for abatement, to their facility directors and to a national database maintained by the Center for Excellence located at the VA Medical Center in Canandaigua, New York. In October 2008, the facilities completed their fourth quarterly reviews using the checklist.

The MSIT uses the checklist as a tool to explicitly assess the level of patient safety in its mental health units. The MSIT identified the types and location of each hazard it identified and then rated the hazard along two continua—severity and probability of occurrence—using the risk-level classification chart (Table 1).

**DATA ANALYSIS**

We described the relative frequencies of hazards and locations and use correlational analysis to analyze the associations between the assessed hazard classification and both the type and location of the hazards. In addition, we analyzed associations between the size and age of the facility and the number of hazards identified and the percentage of hazards abated by the facility by the end of 2008 (our measure of implementation of the checklist).

**Results**

**CHARACTERISTICS OF MENTAL HEALTH UNITS**

All 113 VA facilities with mental health units treating suicidal patients used the checklist to evaluate their units. These facilities identified and rated 7,642 hazards. At the end of the first year of the project, 5,834 (76.3%) of these hazards had been abated. The number of psychiatric beds in our facilities ranged from 3 to 171 (mean, 37.8; standard deviation [SD], 34.0), while the number of identified hazards ranged from 4 to 209 (mean, 63.8; SD, 39.5). The age of mental health units (defined as the number of years since the last renovation) ranged from 2 to 73 years (mean, 18.0 years; SD, 14.0 years), and the ratio of hazards to number of beds ranged from 0.1 to 17.3 (mean, 2.8; SD, 2.5; see Table 3 [page 90]).

Correlational analysis of the facility-level factors revealed a positive relationship between the age of the facility and the number of hazards identified ( $r = 0.19, p = .048$ ) but no correlation between the age of the facility and the percentage of hazards abated by the end of 2008. In addition, there was a strong negative correlation between the number of beds in a facility and the ratio of hazards identified per bed ( $r = -.487, p > .0001$ ), but no correlation between the number of beds in a facility and the percentage of hazards abated.

Table 2. Composition of the Multidisciplinary Safety Inspection Team

- The suicide prevention coordinator
- The patient safety manager
- A facility occupational safety manager or specialist
- A psychiatric unit nurse manager
- A nonpsychiatric unit nurse manager
- A psychiatrist
- A mental health worker (e.g., an outpatient case manager, therapist, psychology technician)
- A representative from engineering
- A representative from environmental services

Table 3. Average Number of Psychiatric Beds and Hazards Identified in Sample

	Number of Psych Beds	Number of Hazards Identified	Number of 4–5 Level Hazards	Age of Psych Unit in Years	Ratio of Hazards to Beds	Percent Hazards Abated
Mean	37.76	63.76	13.85	20.52	2.774	90.3%
Std. Deviation	33.963	39.506	14.695	14.013	2.5000	14.29%
Minimum	3	4	0	2	0.1	40%
Maximum	171	209	89	73	17.3	100%

### RISK LEVEL AND LOCATION OF HAZARDS

As shown in Figure 2 (page 91), approximately 2% of the identified hazards were identified as critical hazards, and another 27% were rated as serious, for a total of 2,192 hazards.

Figure 3 (page 91) displays the location of the hazards. Many hazards were in multiple locations, but the most common specific rooms were bathrooms and bedrooms. Figure 4 (page 92) displays the types of hazards identified. The most common hazard was anchor points—that is, protrusions that could support the weight of a patient attempting to hang him or herself. The next most common hazard was material that could be used as a weapon against staff or other patients, followed by security issues which describes a problem keeping patients in the secured unit environment.

### ASSOCIATION BETWEEN HAZARDS AND RISK LEVELS

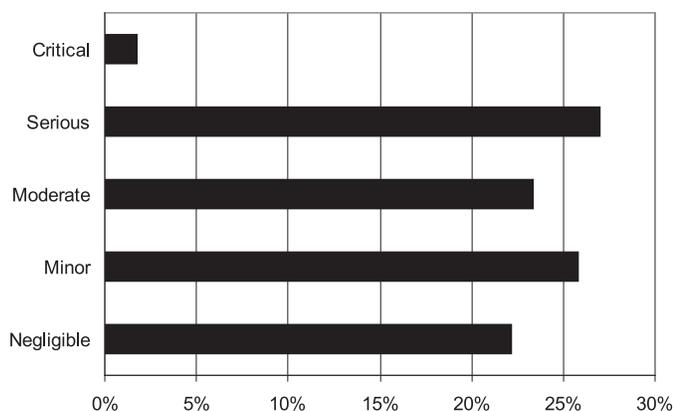
Correlational analysis using Spearman’s rho revealed the following associations between type of hazard and risk-level classifications: Anchor points had the greatest association with higher risk-level classifications (Rho = .229,  $p < .001$ ), followed by suffocation risk (Rho = .044,  $p < .001$ ) and poison risk (Rho = .023,  $p = .044$ ). The most common suffocation risk was the use of plastic liners in trash cans, while poisoning risk came from access to cleaning products. Further correlational analysis between type of room and risk-level classifications revealed the following associations: Bedrooms had the greatest association with higher risk-level classifications (Rho = .126,  $p < .001$ ), followed by bathrooms (Rho = .103,  $p < .001$ ), and congregate bathrooms (Rho = .030,  $p = .010$ ).

### Discussion

This article reports on the first study to examine the implementation and effectiveness of using a standardized checklist for mental health units to improve patient safety in a large health care system. We found that anchor points capable of sustaining the weight of a patient attempting to hang him- or herself in bedrooms and bathrooms were the most common and dangerous identified hazards. In a systematic review of suicide by hanging, Gunnell et al.<sup>19</sup> report that 50% of all hanging suicides have a ligature point below the head, so it is important to identify anchor points both above and below the head and even those relatively close to the floor. The identification of lower anchor points was emphasized in the checklist, especially in the bedroom and bathroom where, because of the greater ease of isolation, patients are at the highest risk for suicide. In our study of inpatient suicide in VA hospitals,<sup>9</sup> we found that doors and wardrobe cabinets accounted for 41% of the anchor points when hanging was the method of self-harm, so the removal of unnecessary doors was also emphasized in the checklist. Removing doors, however, continues to be a difficult process; solid corridor doors are required for fire safety, and bathroom doors are desired for privacy. Consequently, we have worked closely with interior designers and vendors to “design out” the need for doors where possible (for example, walking around a wall can replace the need for a door), and we have pilot-tested over-the-door alarms, modified piano hinges, and anti-ligature door handles where doors remain.

Although anchor points represented almost 44% of the total number of identified hazards, materials that could be used as

**Percentage of Hazards Identified on Inpatient Psychiatric Units at Each of the Five Levels of Risk**

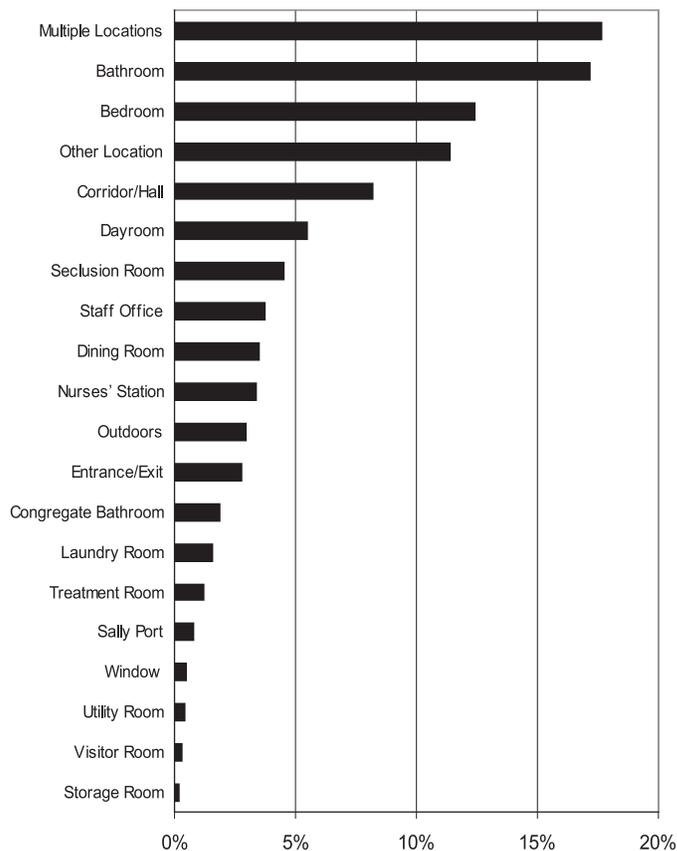


**Figure 2.** Approximately 2% (133) of the identified hazards were identified as critical hazards, 27% (2,059) were rated as serious, 23.4% (1,781) were rated as moderate, 25.8% (1,965) were rated as minor, and 22.1% (1,688) were rated as negligible (16 hazards were not rated).

weapons comprised nearly 14% of the total. It is critical to review the mental health environment of care with an eye for these potential weapons. Dresser drawers, moldings, cords, tiles, flatware, chairs, artwork, and virtually any small object can all be used to harm another or oneself and must be carefully reviewed. Yeager<sup>20</sup> also recommended looking for heavy panels on furniture or heating devices that can be removed and used to break windows or as a weapon against other patients or staff, as well specific protocols to ensure that dangerous items coming onto the unit, such as cleaning products, and items already on the units, such as lunch trays and flatware, are not left unattended.

Another common hazard was patients eloping from the secured environment, coded as “security issues” in our analysis. This type of hazard is realized not only when a patient elopes from the unit without supervision but also when a patient gains access to dangerous areas within the unit—for example, when utility room doors are not locked or group rooms are not supervised. It is not uncommon for secure environments to have areas, such as physical therapy or art rooms, where it is unsafe for suicidal patients to be unsupervised. In these areas it is critical to have redundant systems in place to ensure that the doors are closed and locked every time the staff leave. This requires ongoing staff training and is helped by environmental safeguards such as self-closing and locking doors. These safeguards can prevent unauthorized patient entry because staff don’t need

**Location of Identified Hazards on Mental Health Units**

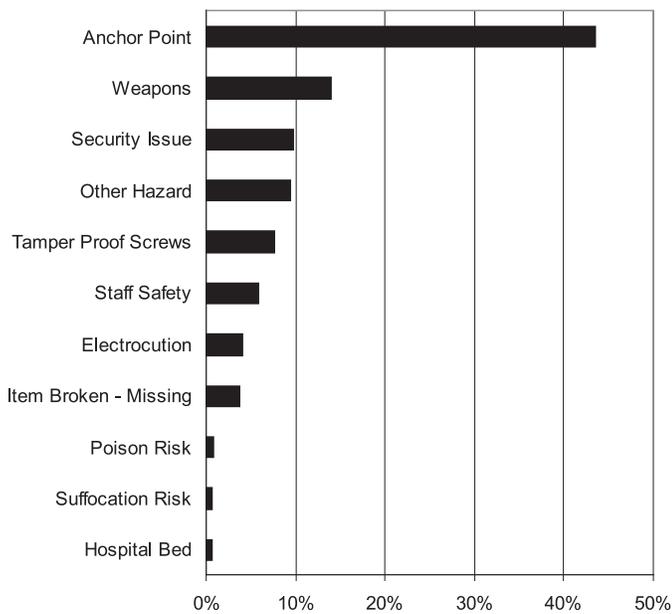


**Figure 3.** Many hazards were in multiple locations, but the most common specific rooms were bathrooms and bedrooms.

to remember to close and lock the door, but they also need to be balanced against staff safety because the likelihood of staff and patients being in the room when the door is closed will also be increased. The same idea applies to camera monitoring of secluded areas. It is not reasonable to expect staff to reliably monitor a camera for long periods,<sup>21</sup> and it is far better to make the environment safe enough so that monitoring is not needed.

As previously discussed, our correlational analysis revealed that anchor points were commonly assigned a higher risk-level classification, as were suffocation risks and poison risks. Although suffocation and poisoning were identified less often, they were very important to abate because of their high level of lethality. The most common suffocation risk was the use of plastic liners in trash cans, while poisoning risk came from access to cleaning products. By rating each hazard using the risk-level classification chart, MSITs could prioritize hazards

**Percent of Each Type of Identified Hazards on Inpatient Mental Health Units**



**Figure 4.** The most common hazard was anchor points—that is, protrusions that could support the weight of a patient attempting to hang him- or herself.

and develop a rational plan for their abatement, starting with the highest risk-level hazards first.

It is important to note that the 2,192 serious or critically serious hazards were identified in mental health units that were treating actively suicidal patients. The large number of serious hazards and the low rate of completed suicide attempts point toward the low absolute risk associated with any one of these hazards. In our previous study of inpatient suicide in the VA, we determined the rate of completed suicide on psychiatric units to be approximately 2.3 per 100,000 psychiatric admissions.<sup>9</sup> It is still too early to assess the impact of the current program on the suicide rate because many facilities are still in the process of remodeling and abating identified hazards.

As we reported, the percentage of identified hazards that were abated within the first year ranged from 40% to 100%, and the ratio of hazards identified per bed ranged from 0.1 to 17.3 hazards per bed. We also found a strong negative relationship between the number of beds in a facility and the ratio of hazards per bed, suggesting that facilities with more beds identified fewer hazards per bed. This result reflects the identification of similar types of hazards for entire units—for example, all closet doors pose a hazard and should be removed, so units with more beds end up with a lower total number of identified

hazards per bed. In addition, although there was some variation in the percentage of hazards abated, we did not find a relationship between the percentage of hazards abated and either the size or the age of the facility. One of the largest barriers to implementation was removed by a national commitment to pay for the abatement of all identified hazards.

This study has several limitations. First, although the checklist was designed using all known published literature regarding inpatient suicide attempts, it is still too early to determine whether use of the checklist has been shown to actually decrease completed suicides or the injuries associated with suicide attempts. Although future research will focus on this important question, there is no current evidence that use of the checklist will decrease the rate of patient injury. Second, although the checklist was designed to be used by clinical staff, there was no specific training of staff regarding its use. Furthermore, we have no evidence to demonstrate that the checklist was being used correctly. It is therefore possible that the checklist was incorrectly used, resulting in either under- or over-detection of potential hazards. The large number of hazards identified and the consistency of reports across more than 100 hospitals makes this overall risk low. We have no doubt, however, that some hazard was missed at some hospital. Finally, our focus with this checklist was on mental health units and not general medical units. Although the checklist could be used by non-VA psychiatric units, its usefulness for general medical units is limited because it would be almost impossible to comply with the checklist and continue to treat complex medical patients (see Bostwick and Lineberry<sup>22</sup> for further discussion of this issue). For suicidal patients on general medical units, it is recommended that one-to-one observation be used.

Limitations aside, the development and use of the Mental Health Environment of Care Checklist were undertaken to achieve one simple overriding goal: that no veteran should ever commit suicide while hospitalized in a VA psychiatric unit. (The issue of whether the costs associated with detection and mitigation of suicide hazards are justified in view of the overall low risk of inpatient suicide is beyond the scope of this article.) The checklist and resulting mitigation of hazards are seen as another step toward the overall goal of preventing inpatient suicides. ■

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