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## Suicide screening scales may not adequately predict disposition of suicidal patients from the emergency department

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## ABSTRACT

**Background:** Suicide screening scales have been advocated for use in the ED setting. However, it is currently unknown whether patients classified as low-risk on these scales can be safely discharged from the emergency department. This study evaluated the utility of three commonly-used suicide screening tools in the emergency department to predict ED disposition, with special interest in discharge among low-risk patients.

**Methods:** This prospective observational study enrolled a convenience sample of patients who answered “yes” to a triage suicidal ideation question in an urban academic emergency department. Patients were administered the weighted modified SADPERSONS Scale, Suicide Assessment Five-step Evaluation and Triage, and Columbia-Suicide Severity Rating Scale. Patients who subsequently received a psychiatric evaluation were included, and the utility of these screening tools to predict disposition was evaluated.

**Results:** 276 subjects completed all three suicide screening tools and were included in data analyses. Eighty-two patients (30%) were admitted or transferred. Three patients (1%) died by suicide within one year of enrollment; one was hospitalized at the end of his or her enrollment visit, dying by suicide seven months later and the other two were discharged, dying by suicide nine and ten months later, respectively. The screening tools exhibited modest negative predictive values (range: 0.66–0.73).

**Conclusion:** Three suicide screening tools displayed modest ability to predict the disposition of patients who presented to an emergency department with suicidal ideation. This study supports the current ACEP clinical policy on psychiatric patients which states that screening tools should not be used in isolation to guide disposition decisions of suicidal patients from the ED.

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### 1. Introduction

Suicide was the tenth leading cause of death for all ages and the seventh leading cause of in-hospital adverse events in 2016. Unfortunately, predicting suicidal behavior remains challenging in the emergency department (ED) setting. Neither simple questions about suicidal ideation (SI) at triage nor structured suicide screening tools have been shown to adequately predict suicidal behavior among ED patients [1–7]. However, a screening tool that exhibits poor sensitivity for suicide could potentially still have significant clinical utility if it could detect patients who might be safely discharged from the ED [8]. At least one study has

indicated that this may indeed be the case. Although the weighted modified SADPERSONS scale (MSPS) may have poor sensitivity for eventual suicide [9], a study by Hockberger and Rothstein has indicated that it nonetheless might be useful in predicting emergency department disposition [10]. In this single-center study, the authors used hospitalization as their primary outcome measure and reported a 100% negative predictive value. Despite this impressive finding, however, other studies have failed to predict patient disposition and suicidal behavior using screening tools [11–14]. Subsequently, a recent American College of Emergency Physicians (ACEP) clinical policy on psychiatric patients recommended against using existing screening tools in isolation to discharge patients from the emergency department in part because studies in this domain have been limited by poor follow-up and screening tools with low predictive validity [15].

The objectives of this study were to replicate the results of Hockberger and Rothstein and further investigate whether other suicide

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screening tools might have similarly high negative predictive values in predicting disposition of suicidal patients from the ED.

## 2. Methods

### 2.1. Setting and participants

This is a prospective observational study of a convenience sample of patients presenting to an urban academic ED with approximately 65,000 visits per year. Data were collected from 8/5/13 to 7/31/15 whenever research associates were available, typically weekdays, between 8 AM and 8 PM. The local Institutional Review Board committee (IRB) reviewed and approved this study prior to data collection.

Patient responses to questions from the Modified Sad Persons Scale (MSPS), the SAFE-T scale, and the Columbia Suicide Severity Rating Scale (C-SSRS) were collected prospectively using REDCap software implemented on tablet computers. Patients were only approached after being evaluated by their emergency physician and before being admitted, transferred or discharged.

Patients were eligible for inclusion if they were  $\geq 18$  years of age and answered 'yes' to a suicide screening question by a triage nurse, documented in their chart as: "Does the patient express suicidal ideation (Y/N)?" Patients were only included in data analysis if they also received a formal psychiatry consultation while in the ED. Criteria for exclusion were the following: denial of suicidal ideation, medical instability, incarceration, and not English speaking. Additionally, patients were excluded if they left the ED against medical advice (AMA) after enrollment, as the primary measure of interest was patient disposition.

Following Hockberger and Rothstein, non-psychiatrists were utilized for data collection. However, unlike Hockberger and Rothstein, nonmedical but trained research associates were utilized to administer each screening tool. As many EDs do not have dedicated staff for suicide assessment, this was thought to more closely approximate typical ED practice.

RAs were trained on the administration of the assessment tools, but had little to no other medical background. The RAs are typically undergraduate students or post baccalaureate student volunteers who work four hour shifts in the ED with the specific role to screen for and enroll patients into research studies. They all have been oriented to the hospital as volunteers and completed training regarding the protection of human subjects in research as well as HIPAA. Monthly retrainings were conducted with the RAs and fidelity to study protocol was assessed by biweekly review of case report forms. All RAs were blinded to the hypotheses of this study.

After the ED visit was over, an RA retrospectively collected the disposition, length of stay, and toxicology screening results of each patient. These data were then audited for accuracy and completion by a second trained RA using a protocol designed a priori. A search was also performed of the San Diego County Medical Examiner's database, using first names, last names, and dates of birth for exact matches of patients. Returned matches were manually inspected for the word "suicide". Disagreements were resolved by consensus among study authors; a kappa score was not calculated. Generally accepted guidelines for assessing data retrospectively were followed, including blinding RAs to the hypotheses of the study [16,17].

### 2.2. Screening tools: MSPS

The MSPS assesses ten binary risk factors for future suicidal behavior and is scored from 0 to 14 by summing the points earned for each criterion [10]. Unlike other suicide scales, the MSPS does not operationally define or provide a script when interviewing patients. Please see Table 1 for adapted MSPS criteria.

A cutoff score  $\leq 5$  classified a patient as likely to be discharged, whereas a score of 6 or above classified a patient as likely to be admitted [10].

**Table 1**  
MSPS scoring criteria.

Letter	Meaning	Points
S	Sex (male)	1
A	Age (<19 or >45 years)	1
D	Depression or hopelessness <i>An affirmative response by the patient to the following question:</i>	2
P	<ul style="list-style-type: none"> <li>"Do you presently feel any of the following symptoms: depression, inability to concentrate, inability to sleep, lack of libido, loss of the ability to experience pleasure in activities, or hopelessness?"</li> </ul> Previous attempts or psychiatric care <i>An affirmative response by the patient to at least one of the following questions:</i> <ul style="list-style-type: none"> <li>"Have you ever attempted suicide?"</li> <li>"Are you currently seeking psychiatric care at a medical or private facility?"</li> <li>"In the past, have you sought counseling at a medical center or private facility?"</li> <li>"In your lifetime, have you made a suicide attempt?"</li> </ul>	1
E	Excessive alcohol or drug use <i>At least one of the following patient behaviors:</i>	1
R	<ul style="list-style-type: none"> <li>Presenting to any ED in the past month more than once for alcohol or signs of excessive use</li> <li>Having a blood alcohol level above 80 or testing positive for street drugs such as methamphetamine, cocaine, or PCP at the enrollment visit</li> </ul> Rational thinking loss <i>Agreement by the RA with the following statement:</i> <ul style="list-style-type: none"> <li>Patient displays rational thinking loss (has difficulty comprehending simple facts or being rational)</li> </ul>	2
S	Separated, divorced, or widowed	1
O	Organized or serious attempt <i>Agreement by the RA with the following statement:</i>	2
N	<ul style="list-style-type: none"> <li>Patient has organized or serious suicidal plan (one that could end the life of an average person)</li> </ul> No social supports <i>A negative response by the patient to the following question:</i> <ul style="list-style-type: none"> <li>"Do you have any sources of social support?"</li> </ul>	1
S	Stated future intent <i>Agreement by the RA with the following statement:</i>	2
	<ul style="list-style-type: none"> <li>Patient stated future intent to repeat attempted suicide or patient is ambivalent about doing so</li> </ul>	

### 2.3. Screening tool: SAFE-T

The SAFE-T assesses patient risk factors, protective factors, and suicidality in order to help clinicians determine patient disposition [18]. Like the MSPS, the SAFE-T does not operationally define or provide a script when interviewing patients. However, the SAFE-T diverges from both the MSPS and the C-SSRS in that it lacks an arithmetical system for quantifying risk; please see Table 2 for adapted SAFE-T criteria.

The SAFE-T suggests discharging patients with internal protective factors such as religious affiliations or coping skills as well as external protective factors such as social support or pets if they also lack a plan, intent, and history of suicidal behavior [18].

At least one internal protective factor coupled with at least one external protective factor combined with an absence of all risk factors listed in Table 2 classified a patient as likely to be discharged; all other patients were classified as likely to be admitted.

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