



## Editorial

## New directions for improving the prediction, prevention, and treatment of suicidal thoughts and behaviors among hospital patients

## A B S T R A C T

Each year in the United States, suicidal thoughts and behaviors lead to > 15 million visits to emergency departments and stays in psychiatric inpatient units. We describe three key areas where advances are needed: (1) more accurate detection of patients at risk for suicide in hospital settings, (2) better use of time and resources with patients while in the hospital, and (3) identifying patients who are at the highest risk for suicide when their risk is at its highest. In this introduction to the special issue, we provide describe how the papers in this issue make needed advances regarding these three topics and outline directions for future suicide research in hospital settings.

## 1. Introduction

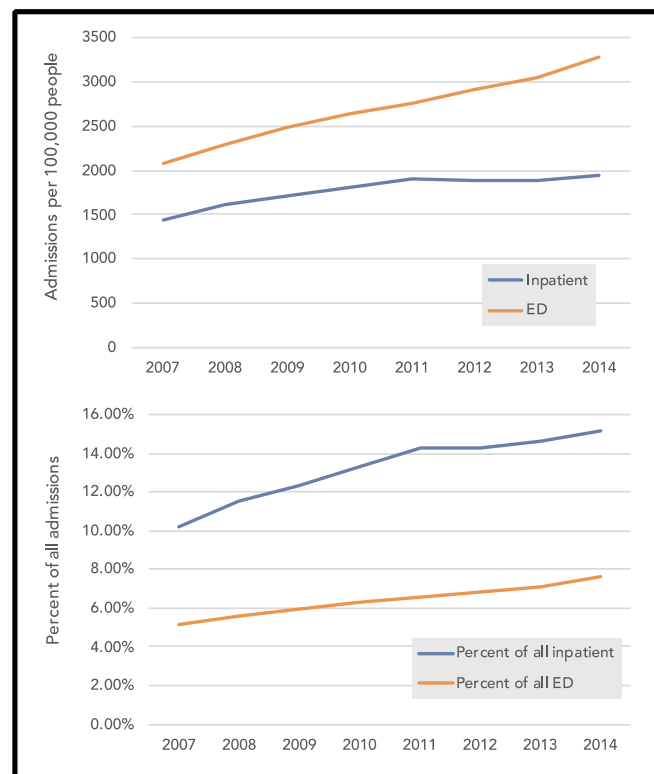
The hospital is one of the most important settings for researchers interested in suicidal thoughts and behaviors. As Fig. 1 shows, rates of emergency department and inpatient unit admissions due to a suicide attempt or suicide risk (including depression) have been steadily increasing over the past 10 years [1,2]. The > 10 million emergency department visits each year in the United States due to suicide risk represent > 15% of all emergency department visits. Moreover, among the 18–44 age group, suicide risk and related factors are the second most common reasons for an inpatient stay (following only complication from pregnancy) [3]. Additionally, the time after leaving the hospital is, somewhat paradoxically, one of the highest risk periods for suicide [4], with more suicides happening in the first three months of discharge from psychiatric care than in the entire next five years combined.

Two viewpoints emerge from these data. First, because of the high concentration of individuals at very high risk for suicide, which is otherwise a low base-rate phenomenon, the hospital setting is an ideal location for studying suicidal thoughts and behaviors. Second, given that an emergency department visit or an inpatient stay is a “last resort” for suicide risk that likely began sometime in the weeks or months before the visit, these rates are alarmingly high. Thus, there is a great need to improve how we screen, treat, and monitor individuals to reduce the rates of suicidal thoughts and behaviors so severe that they warrant a hospital visit in the first place. The papers in this special issue address both of these viewpoints by studying individuals at risk for suicide in a hospital setting, touching on three specific themes: (1) effective risk detection in the hospital setting, (2) better use of time and resources in the hospital, and (3) identifying groups of patients who are at the highest risk for suicide and times at which their risk is the highest. The goals of this introduction to the special issue are to provide an overview of the work on these topics covered in this issue as well as provide commentary about crucial next steps in each area.

## 2. Theme 1: effective risk detection in the hospital setting

In recent years there has been an increased focus on implementing suicide risk screening universally across all hospital units (not just those units explicitly related to mental health). Such a shift comes as a result of recommendations to do so by the Joint Commission [5] and studies such as ED-SAFE [6], which provide initial support for the efficacy of doing so. Despite the institutional and empirical support, for universal screening to be effective, there are several implicit assumptions that must be validated. The papers in this special issue speak to three of these assumptions.

As Horowitz [7; this issue] noted, one reason why we should screen for suicide risk is because we may be able to identify patients at risk for suicide who are already at a place where they can get care. Thus, the first assumption is that for universal screening (vs. targeted screening that only happens for some individuals like those in the psychiatric emergency room) to be effective, individuals at risk for suicide must present to the hospital setting for reasons other than suicide risk, either because the suicide risk is secondary to another complaint or because they are unwilling to voluntarily report on their suicide risk. Research supports that this occurs. For example, Barak-Corren et al. [8] used electronic medical records to track suicidal behavior after hospital visits. Although hospital visits due to mental health reasons were most predictive of future suicidal behavior, visits due to certain injuries (e.g., open wounds) were also predictive. This suggests that these patients may have been concealing injuries from a suicide attempt or perhaps engaging in the types of behaviors that would be related to acquiring the capability for a later suicide attempt. Universal screening may have helped to identify suicide risk among those who do not explicitly report to the emergency department due to suicide risk. Illustrating this point, Wnuk, Parvez, Hawa, & Sockalingam [9; this issue] found that 4.2% of their sample of individuals who were about to have bariatric surgery had attempted suicide in their lifetime, a rate > 10 times higher than the national average [10]. Thus, screening in all settings would mean that we would be able to evaluate groups such as bariatric surgery patients, who are at elevated risk for suicide, but not traditionally



**Fig. 1.** Admission rates (per 100,000 people) to emergency departments and inpatient units due to suicide risk (top panel) and percent of all admissions to each respective unit these admissions represent (bottom panel).

Note. ED = Emergency Department. Data are drawn from the HCUPNet project [1,2] which reflects data for all 50 states in the United States.

considered a high-risk group.

The second assumption is that all people who present to the emergency department will be effectively screened. Urban et al. [11; this issue] showed that this is not always the case. They found that individuals who are intoxicated are less likely to be screened for suicide risk when they present to the emergency department. This is problematic because alcohol use is associated with suicide risk [12,13] and individuals presenting to the emergency department as intoxicated are potentially at higher risk for an alcohol use disorder, thus heightening their risk for suicide. Accordingly, it is crucial to establish screening procedures that are part of the workflow for all participants.

The third assumption is that the screeners being used to identify suicide risk are effective at doing so. According to Nestadt [14; this issue], however, this assumption may not necessarily be the case. One reason for this is that most screeners primarily assess current levels of suicidal thinking. Suicidal thinking is only weakly related to future suicidal thoughts and behaviors [15]. This suggests that screening for current suicidal thinking alone may not effectively identify future suicide risk. Consequently, for universal screening to be effective, it is imperative to expand the screeners to focus on a wider range of suicide risk factors. For example, O'Connor et al. [16; this issue] tested a “risk ruler” that includes a wider range of factors beyond suicidal thinking. Beyond using screeners that employ a wider range of risk factors, as we discuss later in this introduction to the special issue, there is also a need to explore new risk factors that can be assessed in future screeners.

### 3. Theme 2: better use of time and resources in the hospital

A second theme present in the papers in this special issue is the importance of better using the time (both patients' and staff members') and resources involved in hospital psychiatric care. By using innovative treatments designed to reduce the amount of patient downtime, the time spent in the hospital can be used more effectively to improve

patient outcomes. The use of technology can help free up the necessary resources to enact these innovative treatments.

#### 3.1. More efficient use of time in the emergency department

Individuals who visit the emergency department due to suicide risk are often there for several hours, including those who are ultimately discharged rather than transferred to a higher level of care [17]. As Guzmán, Tezanos, Chang, & Cha [18; this issue] noted, this time can be quite stressful in part because little of it is spent receiving care or evaluation. Thus, there may be ways to use patient “downtime” in a way that efficiently provides some treatment. Two studies in this special issue offer ways to do this. First, Dimeff et al. [19; this issue] present initial information on Virtual Collaborative Assessment and Management of Suicidality (Virtual CAMS) a tablet-based implementation of CAMS, a framework for assessing and responding to suicide risk [20]. This implementation of CAMS is particularly interesting because it is a completely automated way to complete risk assessments while patients wait in the emergency department and even begin some therapeutic interventions. Beyond Virtual CAMS, Dimeff et al.'s study provides support for the acceptability of other tablet-based assessments and interventions that can be used to improve the efficacy of patients' downtime while they wait for a clinical provider in the emergency department. Second, O'Connor et al.'s [21; this issue] Teachable Moment Brief Intervention is an efficient treatment that can be given during the downtime experienced in the emergency department. It takes between 30 and 60 min and has several brief modules focused on helping patients identify the functions of a suicide attempt and the proximal and distal protective factors that may prevent a future attempt. Although tested in an inpatient setting, due to its short time requirements, Teachable Moment Brief Intervention could be particularly appealing for use in the emergency department with individuals who have attempted suicide and are awaiting admission to inpatient care.

### 3.2. More efficient use of time in the inpatient unit

The problems associated with excess downtime are not limited to the emergency department. In fact, these problems are possibly greater during the inpatient stay. Studies show that patients spend between 4% and 20% of their time interacting with clinical staff members [22]. This leads patients to spend a considerable amount of time (as high as 84% in some studies [23]) disengaged from staff or other patients on the unit. It is therefore unsurprising that patients often report that they are bored during inpatient care [24]. Given this high rate of underutilized downtime, there is ample room to build in treatments that could, in a potentially cost-effective manner, provide a better therapeutic usage of patients' time in inpatient care.

Three studies in this special issue address novel treatments for use in an inpatient setting. First, Conner, Wiegand, & Goldston's [25; this issue] treatment for suicide risk reduction among inpatients with problematic alcohol use is novel because it targets the unique risk for suicide associated with alcohol use that other general treatments may not address. Second, Bentley et al.'s [26; in this issue] initial data on the Unified Protocol for Transdiagnostic Treatment of Emotional Disorders has strong promise for its ability to improve inpatient care. It addresses a wide range of factors related to suicide risk, making it applicable to nearly anyone on an inpatient unit. Its use of a group-based rolling format is particularly well-suited for an inpatient unit where admissions occur on a rolling basis and clinical staff are limited, making one-on-one therapy not always feasible. Finally, the sessions are relatively brief, taking just 6 h total for all seven modules, making it particularly well-suited for short stays common in inpatient psychiatric care. Third, Holloway et al.'s [27; this issue] pilot trial of Post-Admission Cognitive Therapy is another treatment with great promise to improve inpatient care. Much like Bentley et al.'s [26] treatment, it is brief, taking just 6 to 9 h over three days. Additionally, this treatment is novel because it focuses heavily on preparing patients to better understand the causes of their suicide crises and giving them the skills to prevent future suicide attempts.

### 3.3. Better using hospital resources

Beyond making a better use of the time spent in inpatient care, it is important to explore why this time is underused in the first place. A common standard of care on most inpatient units is the use of constant (or near constant) physical observation. This means that a substantial portion of staff resources on an inpatient unit are devoted to ensuring patient safety rather than promoting patient recovery. One solution posed by Kroll et al. [28] in this issue is virtual monitoring, which allows patients several patients at a time to be monitored in a remote room in the hospital. This promising technology offers the potential to improve efficiency because more patients can be observed by fewer staff members, freeing up staff members to engage in activities more likely to improve patient recovery. An added benefit of virtual monitoring is that by replacing some staff walking around an inpatient unit, it can avoid one source of disruptions in sleep. Sleep problems are well-documented on inpatient units [29]. This could be potentially relevant to inpatient psychiatric care given how strongly sleep problems are associated with suicide risk (see Kearns et al. [30] in this issue for review).

## 4. Theme 3: identifying groups of patients who are at the highest risk for suicide and times at which their risk is the highest

Although individuals in the psychiatric emergency department or inpatient unit are at higher risk for suicide than nearly any other group, most of these individuals will not die by suicide. To illustrate this point: one study found that 1 in 48 people who visit the hospital for mental health reasons died by suicide in the 36 years after their first hospital visit [31]. Although this rate is considerably higher than the general population, where 1 in 540 people died by suicide over the same 36-year period, 1 in 48 is still a low number in absolute terms. That is, just over

2% of all people who visit the hospital for mental health reasons will die by suicide. Accordingly, it is important to identify factors that can distinguish which individuals in the hospital setting are at the highest risk for suicide after they leave the hospital. Doing so could help point to subgroups who are in need of the most intensive follow-up care.

One way to do this is to use methods such as latent class analysis which can identify subgroups of individuals based on combinations of known risk factors. Although this approach has been used for several years within the suicide literature [32,33], Randall, Sareen, & Bolton [34; this issue] highlighted an important consideration about these models. They identified subgroups of individuals presenting to a psychiatric emergency room that differed on levels of a variety of heavily-studied suicide risk factors (e.g., psychotropic medication use, childhood abuse). When comparing these groups on relevant outcomes (e.g., suicide death), however, there was no clear group who was the most likely to die by suicide. This means that although it is possible to identify subgroups of individuals based on suicide risk factors, doing so may not improve prediction of suicide.

There are at least three reasons why identifying subgroups of individuals at risk for suicide may not improve prediction. First, it may be that models like latent class analyses are potentially useful for identifying high-risk subgroups, but the factors that we include in these models are not the right ones. Accordingly, work on important but relatively understudied suicide risk factors is needed. Several papers in this special issue address this need by offering evidence for pain as a risk factor for suicide attempts [35] and sleep problems as a risk factor for suicide thoughts and behaviors [30]. Second, it may be that certain high-risk groups are only at elevated risk during certain high-risk times. Thus, it is important to identify these high-risk time periods. Two studies in this special issue did just that. Using real-time monitoring, Arney, Brick, Schatten, Nugent, & Miller [36; this issue] found that negative affect was most strongly related to suicidal thinking in the time immediately after discharge from the hospital. Using linked medical record data, Katz et al. [37; this issue] found that patients were particularly likely to have suicidal thoughts or engage in suicidal behaviors in the month after filling a new or modified antidepressant prescription. Third, because most conceptualizations of subgroups are static (e.g., experiencing abuse as a child) or trait-like and given that suicide risk is highly dynamic [38,39], it may be that certain subgroups are only at higher risk for suicide in the context of dynamic time-varying factors (e.g., mood, social context). For example, Millner et al. [40; this issue] found that although suicide attempters are not necessarily more impulsive than suicide ideators in general (as would be expected from prior research), they are more impulsive when in a negative mood state. This might suggest that impulsivity (a trait-like factor) is most relevant to suicide risk in the context of negative mood.

## 5. Summary and conclusions

This special issue highlights the role that hospital psychiatry can play in better predicting, preventing, and treating suicide risk across three themes: (1) Effective risk detection in the hospital setting, (2) better use of time and resources in the hospital, and (3) identifying groups of patients who are at the highest risk for suicide and times at which their risk is the highest.

Beyond the themes address in this special issue, there are several other areas related to hospital psychiatry where more work is needed. First, there is a need to better integrate technology into psychiatry. Although several studies in this special issue begin to address this, there is still much more work to be done. Indeed, compared to other hospital units (e.g., cardiology), the technology used in psychiatric inpatient units has evolved little in the past few decades. Recent advancements in mobile technology may offer promise into new ways to monitor patients' safety (e.g., as proposed by Kroll in this issue but also by using wearable devices that can passively sense signals of distress) and improve the efficiency of treatment (e.g., by using smartphones or tablets). Second, there is a need to improve the reintegration out of inpatient

care. The transition back to life at home, work, or school can be quite challenging for a variety of reasons (e.g., needing to make up for lost work, returning to unresolved stressors, explaining to others why they were in the hospital). There is a relative absence of treatments specifically designed to ease this transition. Third, there is a need for better post-discharge monitoring of patients. Although we know that the time immediately after discharge from the hospital is a period of very high risk, we lack strong data on why this is. Improved post-discharge monitoring (e.g., through smartphone-based real-time monitoring like Armey et al. used in this special issue) may offer insight about what types of experiences contribute to risk during this period.

Taken together, the hospital setting is important for those who want to study suicide risk both because of the high concentration of high-risk individuals in the setting and because of the multiple avenues of research not yet explored. We hope that these manuscripts will provide a springboard for future research in the hospital setting across these three themes and others that may emerge.

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Evan M. Kleiman<sup>a,\*</sup>, Matthew K. Nock<sup>b</sup>

<sup>a</sup> Rutgers, The State University of New Jersey, Piscataway, NJ, United States of America

<sup>b</sup> Harvard University, Cambridge, MA, United States of America  
E-mail address: [evan.kleiman@rutgers.edu](mailto:evan.kleiman@rutgers.edu) (E.M. Kleiman).

\* Corresponding author at: Tillett Hall, Room 627, 53 Avenue E, Piscataway, NJ 08854, United States of America.