Behavioral Sciences and the Law
Behav. Sci. Law **24**: 731–746 (2006)
Published online in Wiley InterScience
(www.interscience.wiley.com) DOI: 10.1002/bsl.726

Suicide-Related Behavior after Psychiatric Hospital Discharge: Implications for Risk Assessment and Management

Jennifer L. Skeem, Ph.D.,* Eric Silver, Ph.D.,† Paul S. Aippelbaum, M.D.‡ and Jenny Tiemann, B.A.§

Suicide-related behavior (SRB), including suicide attempts and instrumental SRB, occurs far more often than completed suicide and exacts a toll on patients, their loved ones, and society. Nevertheless, few prospective studies of SRB have been conducted. In this study, 954 patients were interviewed in a psychiatric hospital and then followed for one year after discharge. During this one-year period, nearly one-quarter of patients (23%) engaged in SRB, with the rate of suicide attempts (18%) three times greater than the rate of instrumental SRB (5%). Risk factors for SRB were demographic (White ethnicity, female gender), clinical (past SRB, depression, impaired functioning), and contextual (unemployment, large social networks). In contrast with other studies, there was no ''peak'' in the risk of SRB shortly after hospital discharge. Instead, patients' rate of SRB was relatively constant over the one-year follow-up. Implications for risk assessment and management in acute inpatient settings are discussed.
Copyright © 2006 John Wiley & Sons, Ltd.

Although suicide is the leading cause of violent death world-wide (World Health Organization, 2004), it represents only a small fraction of self-injurious behavior. In the year 2000, the rate of intentional, self-inflicted injuries that required medical

*Correspondence to: Jennifer L. Skeem, Ph.D., University of California, Irvine, CA, U.S.A.
E-mail: skeem@uci.edu
†Pennsylvania State University.
‡University of Massachusetts Medical School.
§University of Nevada, Las Vegas.
Work on this article was supported by the MacArthur Foundation Network on Mental Health and the Law and the National Institute of Mental Health (Grant 5-34282 for the collection of collateral data).

Contract/grant sponsor: MacArthur Foundation Network on Mental Health and the Law.
Contract/grant sponsor: National Institute of Mental Health; contract/grant number: 5-34282.

Copyright © 2006 John Wiley & Sons, Ltd.

attention was at least nine times higher than the rate of completed suicides (Centers for Disease Control and Prevention, 2004; McCaig & Ly, 2001; Minino, Arias, Kochanek, Murphy, & Smith, 2002). People who engage in suicide-related behaviors (SRBs) that do not result in death are at high risk for future self-injury and completed suicide (Brown, Beck, Steer, & Grisham, 2000; Cooper et al., 2005). These individuals often suffer from mental disorders and are heavy consumers of emergency psychiatric services (Platt et al., 1992).

A psychiatric patient's risk of self-injury is "a source of endless disquiet to practicing mental health professionals" (Bongar, 2002, p. 3). Clinicians typically work in environments that require them to manage high-risk patients in outpatient settings. Little empirically based guidance is available to aid them in this task. Most research in this area is retrospective rather than predictive, limited to high-risk samples (e.g. depressed patients), focused on narrow classes of SRB (e.g. completed suicide), or restricted to static predictive variables (e.g. demographic factors). Studies also apply varying definitions of SRB, which makes integrating their results difficult. To inform clinical efforts to identify and reduce risk of SRB, more rigorous research is needed.

In this study, we focus on risk of SRB among a sample of 954 discharged psychiatric inpatients. We define *SRB* as potentially self-injurious behavior in which the person either intended at some non-zero level to kill herself (*suicide attempt*), or wished to use the appearance of a suicide attempt to achieve some other purpose (*instrumental SRB*; O'Carroll et al., 1996). We focus on SRB because it is relatively common, accounts for a substantial expenditure of psychiatric and general medical resources, and concerns clinicians, who must attempt to predict and manage their patients' behavior in the community. We focus on discharged psychiatric patients because they are at high risk of engaging in SRB, because they are more likely than outpatients to die by suicide (Bostwick & Pankratz, 2000), and because clinicians must make reasoned decisions about whether and how to discharge them. Because few studies have adopted this focus, we begin by summarizing relevant past research.

Most research focuses on the correlates of suicide attempts and completed suicide (Beautrais, Joyce, & Mulder, 2000; Maris, Berman, & Silverman, 2000). The most robust correlates are past SRB and certain types of psychopathology (major depressive, substance-related, externalizing personality, and comorbid disorders). Schizophrenia appears to be a more robust correlate for completed suicide than suicide attempts (Beautrais, 2001). Women, youth, and young adults (ages 15–24) are more likely to attempt suicide, whereas men and the elderly are more likely to complete suicide. White and unmarried individuals are at relatively greater risk both to attempt and complete suicide. Contextual correlates include stressors (e.g. interpersonal loss), social isolation, and familial history of SRB.

Less is known about the correlates of SRB more broadly. In a multi-site study conducted by the World Health Organization (WHO), correlates of SRB included prior SRB, younger age (under 34), female gender, unmarried status, and low socioeconomic status (Platt et al., 1992; Schmidtke et al., 1996). Data from two sites indicate that SRB also correlates with psychopathology (depressive, substance-related, personality, and comorbid disorders; Haw, Hawton, Houston, & Townsend, 2001; Suominen et al., 1996). These results suggest that the correlates of SRB are similar to those for suicide attempts and, to a lesser extent, suicide completion. To date, however, few studies have distinguished between suicide

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

attempts and instrumental SRB, although almost half of all apparent "suicide attempters" do not intend to die (Kessler, Borges, & Walters, 1999). Moreover, no prospective studies of adult psychiatric inpatients are available to inform clinicians' efforts to predict and prevent their SRB.

Available data do, however, suggest that the risk of *completed* suicide typically peaks within six months of hospital discharge (Pokorny, Kaplan, & Lorimor, 1983; Roy, 1982). Similar findings have been observed for *SRB* more broadly, but these findings are based on patients initially hospitalized for SRB (Beautrais et al., 2000; Kessel & McCulloch, 1966). It is unclear whether the results will generalize to adult psychiatric inpatients as a group. Given the relatively high frequency of SRB and diminishing inpatient resources, this is a large gap in the literature. If clinicians know that a period of pronounced risk for SRB immediately follows discharge, they can justify plans to intensively monitor and treat at-risk patients to prevent SRB. If there is no such peak in risk of SRB just after discharge, clinicians can organize their resources to manage chronic risk on a longer-term basis.

This paper reports an analysis of SRB among adult discharged psychiatric inpatients, with the goals of (1) describing the prevalence of suicide attempts and instrumental SRB during the year after inpatient discharge, (2) identifying demographic, psychiatric, and contextual risk factors for these SRBs, and (3) assessing whether there is a peak in SRB shortly after hospital discharge.

METHOD

The data analyzed in the present research were collected as part of the MacArthur Violence Risk Assessment Study (available at http://macarthur.virginia.edu; Monahan et al., 2001). In this study, researchers interviewed psychiatric inpatients to assess a variety of risk factors for violent and suicide-related behavior. After patients were discharged, researchers attempted to interview them every ten weeks for one year to assess a variety of factors, including their engagement in SRB.

Participants

Participants were sampled according to age, gender, and ethnicity from acute inpatient facilities in three cities to maintain a consistent distribution of these characteristics across sites. Study inclusion criteria were (1) civil admission, (2) between the ages of 18 and 40 years, (3) English speaking, (4) White or African-American ethnicity, and (5) a medical record diagnosis of schizophrenia, schizophreniform or schizoaffective disorder, depression, dysthymia, mania, brief reactive psychosis, delusional disorder, substance abuse or dependence, or personality disorder.

Research interviewers approached 1,695 eligible inpatients to request informed consent, and 71% agreed to participate. The 1,136 participants generally were young ($M = 30$ years, SD = 6), White (69%; African American, 29%; Hispanic, 2%), male (59%), voluntarily admitted (58%), patients with primary diagnoses of depression or dysthymia (40%), schizophrenia or schizoaffective disorder (17%), bipolar disorder

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

(13%), substance abuse (24%), personality disorder (2%), or other disorder (4%). Approximately 36% of patients had co-occurring Axis I and substance abuse disorders. Patients who refused to participate in the study were significantly older, more likely to be diagnosed with schizophrenia, and less likely to be diagnosed with substance abuse and personality disorders than study participants (Steadman et al., 1998).

Procedure

Patients were interviewed initially in the hospital by a research interviewer to obtain data on demographic and historical factors, and by a research clinician (PhD or MA/MSW) to confirm the medical record diagnosis and administer clinical scales. Participants' median length of hospitalization was 9 days. After patients were discharged, research interviewers re-contacted them in the community and interviewed them up to five times (every 10 weeks) during a one-year period. A collateral informant (e.g. family member, friend) for each patient was interviewed on the same schedule. Patients and collaterals were paid for their participation.

Of the 1,136 patients enrolled in the study, 84% completed at least one follow-up interview, 72% completed three or more follow-up interviews, and 50% completed all five follow-up interviews. We included the 954 patients who completed at least one follow-up interview in the present study. Patients who were lost to follow-up were significantly less likely to be diagnosed with bipolar disorder and more likely to be diagnosed with substance abuse disorders; more likely to have a legal status of gravely disabled; and more likely to have a documented history of violence than study completers (Steadman et al., 1998). Additional analyses indicate that patients with SRB (defined below) at baseline were as likely as those without SRB to miss the first two follow-up interviews, and were significantly *less* likely to miss the last three follow-up interviews. To ensure that our results were not confounded by patients missing follow-up interviews, all analyses were replicated using only those patients who completed all five follow-up interviews. These replication analyses yielded results similar to those reported below.

Measures

Clinical Factors

The DSM-III-R Checklist (Janca & Helzer, 1990) was used to code diagnoses of depression (depression or dysthymia), schizophrenia (schizophrenia or schizoaffective disorder), bipolar disorder, substance abuse or dependence, personality disorder, or other disorder. Primary diagnoses obtained using the DSM-III-R Checklist corresponded to a medical record diagnosis in 86% of cases. The Brief Psychiatric Rating Scale (BPRS; Overall & Gorham, 1962) was used to assess patients' symptom constellations (activation, anergia, anxiety–depression, thought disturbance, and hostility). Interrater reliability was acceptable (BPRS total kappa $= 0.73$, with agreement defined as ± 7.5 points). Psychosocial functioning was operationalized as self-reported difficulties with the activities of daily living,

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

using a five-item inventory that asked patients to rate their degree of difficulty in performing daily tasks (e.g. housework, managing money). Suicide-related behavior prior to hospital admission was operationalized as outlined below.

Contextual Factors

Patients' self-reported employment status (employed/unemployed) and residence status (homeless/not homeless) was coded, as was their socioeconomic status (SES; highest classes 1–3; class 4; lowest class 5; Hollingshead & Redlich, 1958). Patients completed the self-report-based Perceived Stress Scale (Cohen, Karmarck, & Mermelstein, 1983) to assess their appraisal of their life situation as unpredictable, uncontrollable, overwhelming, and generally stressful. The interview-based Social Network Inventory (SNI; Estroff & Zimmer, 1994) was used to code the *number* of total persons in each patient's social network, and the *proportion* of the network accounted for by mental health professionals and by family members. Two SNI items were summed to indicate the *number* of conflicted relationships (Silver, 2002).

Suicide-Related Behavior

At baseline and each follow-up, interviewers administered a two-stage structured interview based on the work of Weisman and Worden (1972)) and Beck, Schuyler, and Herman (1974). In Stage One, interviewers determined whether SRB had occurred by asking whether patients had attempted to hurt themselves during the reference period (past two months at baseline; past 10 weeks at each follow-up), and, if so, how they had tried to do so. Patients who took physical action to harm themselves were coded as having engaged in SRB. In Stage Two, interviewers determined the nature and purpose of SRB by asking patients to provide an account of the most recent SRB event ("Can you tell me something about the attempt?"). These accounts were followed up with probe questions about *suicidal intent* (e.g., "Were you trying to kill yourself?" no versus *yes*) and about four indices of SRB risk: (a) premeditation (3 hours or less versus *more than 3 hours of preparation time*), (b) active preparation for attempt (none/minimal versus *moderate/extensive*), (c) a written self-harm note (none/thought about versus *note present/tore up*), and (d) precautions against discovery (e.g. locked door; no versus *yes*).

SRB was coded into two categories, based on the framework by O'Carroll et al., (1996). A *suicide attempt* was defined as self-harm accompanied by evidence of any non-zero level of intent to die. *Instrumental suicide-related behavior* was defined as all other self-harm behaviors. Intent to die was either stated explicitly or was inferred based on the presence of one or more risk indices ((a)–(d) above). These indices were used to infer intent based on their similarity to key items in the Suicide Intent Scale (Beck et al., 1974). Extensive pre-testing indicated that adding inferred intent increased the number of acts labeled as suicide attempts (by 15%). For analyses, dichotomous measures of *suicide attempts*, *instrumental SRB*, and *SRB* (which includes both) were used to reflect whether one or more of these acts occurred prior to baseline (*"recent"* acts) and during each follow-up.

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

Treatment

Treatment involvement was operationalized as the total number of mental health or substance abuse treatment sessions that patients reported attending during the 10-week follow-up periods. Given that treated patients attended a median of eight sessions in follow-up one, treatment involvement was categorized as *little or none* (0–6 sessions), or *moderate to high* (7 or more sessions; see Swartz et al., 1999). Treatment typically consisted of a combination of verbal therapy and medication (37%) or verbal therapy only (40%). Less often, treatment included medication only (10%), drug and alcohol treatment (5%), group therapy only (5%) or other treatment (3%).

RESULTS

SRB: Rate, Timing, and Risk Factors

During the one-year follow-up, 18.0% of patients attempted suicide and 4.8% engaged in instrumental SRB, for an overall SRB prevalence rate of 22.8%. The most common methods of SRB were cutting or stabbing (40.5%) and self-poisoning (39.1%); cutting and stabbing was more often associated with instrumental SRB, and self-poisoning with suicide attempt, $\chi^2[2, N = 348] = 29.6$, $p < 0.001$. According to project records, two patients died by suicide during the course of the study.

As shown in Table 1, the rate of SRB was highest during the two months prior to hospital admission (28%) then dropped, and remained relatively constant across the five follow-up periods following discharge. Rates of SRB at each follow-up period were statistically similar to one another. These results were not due to attrition; the same pattern and nearly identical rates were obtained with the subset of 556 patients who completed all five follow-up interviews. Although patients who had engaged in SRB during the two months prior to admission had a substantially higher rate of post-discharge SRB than those who had not (38% versus 23%; $\chi^2[1, N = 950] = 38.9$, $p < 0.001$), the same pattern of SRB over the one year follow-up was obtained for this high-risk subgroup, as shown in Table 2. Given the stable rate of SRB over the one-year follow-up, most of the remaining analyses focus on SRB occurring at any time during the one-year follow-up period.

Table 3 depicts risk factors for SRB. *Demographically*, instrumental SRB was more common among Whites than non-Whites, and both instrumental SRB and suicide attempts were more common among females than males. SRB was unrelated to

Table 1. Rate of suicide-related behavior (SRB): entire sample

	N	% Suicide attempt	% Instrumental SRB	% Total SRB
Pre-hospital admission	1,135	22.1	5.9	28.0
Follow-up 1	843	7.6	3.3	10.9
Follow-up 2	830	5.9	3.1	9.0
Follow-up 3	768	6.1	2.5	8.6
Follow-up 4	753	4.5	2.1	6.6
Follow-up 5	752	5.5	3.2	8.6
1-year follow-up	951	18.0	4.8	22.8

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

Table 2. Rate of suicide-related behavior (SRB): patients with baseline SRB

	N	Suicide attempt %	Instrumental SRB %	Total SRB %
Follow-up 1	246	14.2	8.1	22.4
Follow-up 2	241	9.5	6.2	15.8
Follow-up 3	230	11.7	4.8	16.5
Follow-up 4	225	10.2	4.4	14.7
Follow-up 5	225	9.8	6.2	16.0
1-year follow-up	275	30.2	8.0	38.2

patient age, SES, or marital status. *Clinically*, patients with primary diagnoses of personality disorder or depression were significantly more likely than patients in other diagnostic groups to engage in SRB, whereas those with primary diagnoses of schizophrenia were at significantly reduced risk. Although *any* diagnosis of depression (primary or comorbid) was associated with increased likelihood of SRB, *any* diagnosis of substance abuse was not. In addition, there was no significant difference in SRB between patients who qualified for one versus more than one diagnosis (data not shown).

We also examined psychiatric symptoms and levels of functioning and found that patients' total BPRS scores and four of its five subscales were unrelated to SRB (data not shown). Only the Anxiety–Depression subscale was significantly related to total SRB (eta $= 0.19$; $F = 1.58$, df $= 23$, $p < 0.05$). Impaired psychosocial functioning was significantly related to both instrumental SRB (eta $= 0.18$; $F = 1.81$, df $= 18$, $p < 0.05$) and suicide attempts (eta $= 0.18$; $F = 1.63$, df $= 18$, $p < 0.05$).

Finally, as noted earlier, patients with SRB during the two months prior to hospitalization were nearly twice as likely as those without pre-admission SRB to exhibit SRB during the follow-up period. To explore the utility of different forms of pre-admission SRB in predicting post-discharge SRB, groups of patients with instrumental SRB versus suicide attempts at baseline were statistically compared. The groups did not differ in their likelihood of future suicide attempts (27 versus 21%, respectively; $\chi^2[1, N = 318] = 0.61$, ns) or total SRB (36 versus 32%; $\chi^2[1, N = 318] = 0.30$, ns). However, patients with instrumental SRB at baseline were more likely to engage in instrumental SRB during the follow-up period (24 versus 11%; $\chi^2[1, N = 318] = 7.18$, $p < 0.01$).

Contextually, SRB was predicted by unemployment and social network size and composition at baseline, but not homelessness, perceived stress, or involvement in conflicted relationships. The size of the social network related *positively* to SRB, whereas the proportion of the social network that was composed of family members and of clinicians related *inversely* to SRB.

SRB as a Function of Follow-up Treatment

As mentioned above, we did not find a significant peak in SRB shortly after hospital discharge. To examine the possibility that this expected peak was masked by the provision of intensive and effective follow-up treatment, we assessed the relationship between treatment involvement and SRB during follow-up 1 for all patients, and for those subgroups likely to be perceived by clinicians as at "high risk" for SRB (i.e.

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

Table 3. Demographic, clinical, and contextual risk factors for suicide-related behavior (SRB)

	N	Suicide attempt		Instrumental SRB		Total SRB	
		%	Odds	%	Odds	%	Odds
Demographic							
Age							
18–25 years	225	19.6	1.1	5.3	1.2	24.9	1.2
25–40 years	726	17.5		4.7		22.2	
Race							
% white	654	18.8	1.2	6.1	3.2**	24.9	1.5*
% non-white	297	16.2		2.0		18.2	
Gender							
% female	403	21.6	1.5*	7.2	2.4**	28.8	1.8***
% male	548	15.3		3.1		18.4	
SES							
Highest I-III	118	14.4	1.2	4.2	1.4	18.6	1.2
Class IV	259	17.4		3.1		20.5	
Lowest V	571	19.1		5.8		24.9	
Marital status							
Married = 1	100	23.0	1.4	4.0	0.8	27.0	1.3
Never married	850	17.4		4.9		22.4	
Clinical							
Primary diagnosis[a]							
Depression	397	20.9	1.4*	6.5	1.9*	27.5	1.6**
Bipolar	132	17.4	1.0	5.3	1.1	22.7	1.0
Schizophrenia	162	6.8	0.3***	1.9	0.3	8.6	0.3***
Substance	211	19.9	1.2	2.8	0.5	22.7	1.0
Personality	20	40.0	3.1*	15.0	3.6*	55.0	4.3**
Other	29	13.8	0.7	3.4	0.7	17.0	0.7
Any diagnosis[b]							
Depression—yes	560	21.4	1.8**	6.6	3.0**	28.0	2.1***
Depression—no	391	13.0		2.3		15.3	
Substance—yes	534	16.7	0.8	3.9	0.6	20.6	0.8
Substance—no	417	19.7		6.0		25.7	
Contextual							
Living & work							
Homeless—yes	50	22	1.3	4.0	0.8	26.0	1.2
Homeless—no	901	17.8		4.9		22.6	
Unemployed	435	13.3	0.5**	3.7	0.6	17.0	0.5***
Employed	516	21.9		4.8		27.7	
Stress & network		*Eta*		*Eta*		*Eta*	
Stress		0. 23		0.17		0.22	
Network size		0.23*		0.17		0.23*	
Proportion family		−0.39*		−0.40*		−0.40*	
Proportion clinicians		−0.34**		−0.32*		−0.34**	
Conflicted relationships		−0.05		−0.07		−0.03	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[a]Inferential tests compare the index diagnosis to all other diagnostic groups combined.
[b]Inferential tests compare the presence with the absence of the diagnosis.

patients with recent SRB immediately prior to hospitalization or with diagnoses of depression). As shown in Table 4, patients with SRB during the first follow-up were on average *more* likely to be involved in intensive treatment. This same pattern held for the high-risk patient subgroups. Next, we assessed whether greater treatment

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

Table 4. Treatment involvement and suicide-related behavior (SRB) during follow-up 1[b]

Comparison	N	Suicide attempt %	Suicide attempt Odds	Instrumental SRB %	Instrumental SRB Odds	Total SRB %	Total SRB Odds
All cases							
0–6 sessions	459	4.6	2.1*	2.4	1.6	7.0	2.0**
≥7 sessions	294	9.2		3.7		12.9	
Recent SRB cases							
0–6 sessions	129	8.5	2.5*	7.0	1.1	15.5	2.0*
≥7 sessions	89	19.1		7.9		27.0	
Primary Dx depression							
0–6 sessions	171	6.4	2.3*	2.9	1.6	9.4	2.1*
≥7 sessions	149	13.4		4.7		18.1	
Any Dx depression							
0–6 sessions	249	5.2	2.6**	2.4	1.9	7.6	2.5**
≥7 sessions	201	12.4		4.5		16.9	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
[b]Inferential tests are of treatment involvement by SRB (present/absent) during the follow-up.

involvement at follow-up X predicted less SRB during follow-up $X + 1$. We found precisely the opposite. For example, greater treatment involvement at the first follow-up predicted a greater likelihood of SRB during the second follow-up, $\chi^2(1, 665) = 10.8$, $p < 0.001$. Of patients involved in little or no treatment during follow-up 1, 6.1% engaged in SRB during follow-up 2, compared with 13.6% of patients who had participated in more treatment. The same pattern held for the high-risk patient subgroups. Because patients were not randomized to treatment conditions, these results cannot be taken as evidence of treatment ineffectiveness. Even *more* patients at risk for SRB might have engaged in SRB had they not been provided with intensive treatment. We cannot rule out the possibility that a peak in SRB risk was present, but masked by intensive post-discharge treatment efforts.

DISCUSSION

This study yielded three key findings. First, the prevalence of serious SRB among discharged psychiatric inpatients is relatively high: nearly one-quarter of patients engaged in SRB during the year following hospital discharge. Second, specific demographic (White ethnicity, female gender), clinical (past SRB, depression, impaired functioning), and contextual (unemployment, large social networks) factors significantly predicted SRB during the one-year period following hospital discharge. Third, there was no peak in SRB immediately following hospital discharge.

In interpreting these findings it is important to note that because our sample was drawn from a high-risk population of adult hospitalized psychiatric patients we cannot determine whether our conclusions apply to patients who were not admitted to psychiatric facilities, or adolescents and patients older than 40 years of age, including the elderly. Moreover, because not all eligible former inpatients completed

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

this study, we cannot rule out the possibility that selection factors were at play. However, most (71%) eligible patients enrolled in the study, and most (84%) of these enrolled patients completed at least one follow-up interview. Given our follow-up period of one year, we cannot comment on the longer-term trajectory of risk for SRB. We believe that these limitations are balanced by the study's prospective design, large sample, and distinction among forms of SRB.

Prevalence of SRB

The time period that precedes and follows a psychiatric hospitalization is one of increased risk for SRB. During the two months before hospitalization, over one-quarter (28%) of patients deliberately harmed themselves. During the year after discharge, almost one-quarter (23%) engaged in SRB, with 18% attempting suicide and 5% engaging in instrumental SRB. These rates are markedly higher than the *lifetime* prevalence rates typically observed among the general population. Results from the National Comorbidity Study suggest a general lifetime prevalence rate of 4.6% for overall SRB, 2.4% for suicide attempts, and 2.2% for instrumental SRB (Kessler et al., 1999).

In contrast with these population statistics, the rate of suicide attempts in the present study was three times that of instrumental SRB. This difference is not solely due to a broad definition of suicide attempts in this study. An act of self-harm was defined as a suicide attempt rather than instrumental SRB if the patient exhibited any evidence of an intent to die (O'Carroll et al., 1996). Intent was either stated by the patient or inferred based on the presence of one or more commonly used indicators (e.g. precautions taken against discovery). Adding inferred intent to stated intent only modestly increased the estimated rate of suicide attempts. Thus, reliance on stated intent alone would reduce the proportion of SRB classified as suicide attempts from 80% to 63%. The latter figure is consistent with the results of the WHO study, which suggests that 64% of SRB involved suicide attempts (Hjelmeland, 1996; Hjelmeland et al., 2002). Additional research suggests that only a small subgroup of patients repeatedly engage in SRB (Kessel & McCulloch, 1966), and this group manifests less intent to die than those with less frequent SRB (Hjelmeland, 1996).

Risk Factors for SRB

General

The risk factors for SRB identified in this research are more consistent with those identified in past research for suicide attempts than they are for completed suicide. These included recent SRB, female gender, White ethnicity, diagnoses and symptoms of depression, unemployment, and difficulties performing the activities of daily living. Similar factors were related to SRB in the WHO study (Platt et al., 1992; Schmidtke et al., 1996) and in related research on parasuicide (Welch, 2001), although young age emerged as a risk factor in some of that work. Setting aside demographic variables, many of these factors also have been identified as among the

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

strongest risk factors for completed suicide among adult outpatients (Brown et al., 2000) and those with past SRB (Beautrais, 2001; Beautrais, Joyce, & Mulder, 1999).

Clinical

In keeping with past work, we found that past SRB is a relatively strong predictor of future SRB (Brown et al., 2000; Diekstra, 1993; Hjelmeland, 1996; King et al., 2001; McKenzie & Wurr, 2001). Diagnostic variables were also important. Patients diagnosed with schizophrenia were significantly *less* likely than other patients to engage in SRB, consistent with the observation that schizophrenia is more indicative of risk for completed suicide than SRB *per se* (Schmidtke et al., 1996). Our finding that patients with substance abuse disorders or diagnostic comorbidity were no more likely than other patients to engage in SRB has received mixed support in prior work. Uncontrolled registration studies (Haw et al., 2001; Suominen et al., 1996) reveal high rates of substance abuse and diagnostic comorbidity among those who engage in SRB. However, prospective studies of adolescent psychiatric patients (Brent, Kolko, Birmaher, Baugher, & Bridge, 1999; Goldston et al., 1999) and adult outpatients (Brown et al., 2000) indicate that substance disorders and diagnostic comorbidity do not strongly predict SRB. Moreover, case–control studies and population surveys (Beautrais et al., 1996; Kessler et al., 1999) indicate that suicide attempts relate much more strongly to mood disorders than to substance use disorders. Our finding also is consistent with evidence that the relationship between comorbid disorders and SRB is weak, after controlling for the main effects of mood disorders (Kessler et al., 1999).

In short, we found that mood disorders and related symptoms are the most important (if not the only) Axis I diagnostic risk factors for SRB among recently treated psychiatric inpatients. We specify Axis I because this study did not include rigorous measures of personality disorder, which precluded a clear assessment of its relationship to SRB. This is an important limitation, given our finding that patients with personality disorder as a *primary* diagnosis were at relatively great risk for SRB, and its consistency with past findings that externalizing and impulsive personality disorders are linked with SRB and completed suicide (Duberstein & Conwell, 1997).

Contextual

Our results also suggest that patients' risk of SRB cannot be approached strictly as a diagnostic enterprise because contextual factors are often involved. In keeping with past research (Platt, 1984; Welch, 2001), we found that patients who were unemployed were at risk for SRB. Patients with social networks that were relatively large were also at *greater* risk for SRB. It seems plausible that patients who are depressed, distressed, and at risk for SRB tend to attract social support from others. However, the literature on social networks and SRB is thin, and sheds little light on the directionality of the associations among these variables.

More counter-intuitive are our findings that patients who were single, involved in conflicted social relationships, or highly stressed were *not* at increased risk for SRB. These findings are inconsistent with evidence that SRB is associated with low social contact, interpersonal conflict, and recent stressful interpersonal, legal, and work

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

events (Beautrais, 2001; Hall, Platt, & Hall, 1999). These inconsistencies may indicate that we did not assess these variables often enough to detect acute changes that may have occurred just before SRB.

Lack of Post-Discharge "Peak" in Risk for SRB

Although most past research suggests that the risk of completed suicide is greatest during the first 1–6 months after hospital discharge, there is less robust evidence that this is the case for SRB. Two studies suggest that the risk of SRB among those with *past* SRB is greatest within 3–6 months of discharge (Beautrais, 2001; Kessel & McCulloch, 1966). In this study of general psychiatric inpatients, we found no peak in the risk of SRB shortly after discharge. Instead, risk remained relatively high and stable for a full year.

Although this lack of a post-discharge peak in SRB cannot be attributed to the effects of attrition or to our focus on a broad patient sample, it may partially reflect clinicians' intensive follow-up treatment efforts. Patients likely to be perceived as high risk by clinicians (e.g. those with recent SRB) were involved in more intensive post-discharge treatment than other patients. To the extent that clinicians effectively intervened where they perceived risk, their efforts may have masked the expected post-discharge spike in risk of SRB. An understanding of the link between treatments received and risk of SRB must await future research. Nonetheless, despite the possible effects of treatment efforts, the risk of SRB was relatively high throughout the one-year follow-up.

Implications for Risk Assessment and Risk Management in Acute Settings

These findings have implications for assessing risk in acute settings. First, our findings indicate that clinicians should attend to the full spectrum of SRB, rather than focusing narrowly on suicide or suicide attempts. When patients injure themselves for instrumental reasons, they may not be taken as seriously in an emergency room as those who attempt suicide *per se*. The results of this study indicate that it would be a mistake to underestimate the risk of those with recent instrumental SRB, dismissing their behavior as manipulative or attention seeking. Relative to patients with a recent suicide attempt, patients with recent instrumental SRB were at equal risk for suicide attempts and greater risk of instrumental SRB during the follow-up. This is consistent with past findings that deliberate self-harm (regardless of intent) strongly predicts future self-injury and completed suicide (Brown et al., 2000; Cooper et al., 2005). This may be because acts of self-harm that are not intended to cause death can do so. It may also be because, over time, many high-risk patients engage in both instrumental SRB and suicide attempts. There is some support for this assumption. Based on a comparison of patients with suicide attempts who did and did not have at least one past episode of instrumental SRB, Stanley, Gameroff, Michalsen, and Mann (2001) found that those with past instrumental SRB were at greater risk for suicide. Although the two groups' SRB was similarly lethal, those with a history of instrumental SRB rated their injuries as less

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

likely to result in death and manifested greater depression, hopelessness, and suicidal ideation.

Second, our findings point the way toward some screening tools and structured protocols to aid in assessing risk of SRB. When clinicians are faced with managing and treating a patient at risk for SRB, ''clinical judgment informed by assessment of risk factors is the mainstay of decision making'' (Rush, Kashdan, Pollack, & Bajmakovic-Kacila, 2004, p. 1491). Although over 20 instruments are available for assessing risk (Range & Knott, 1997), clinicians rate these tools as limited in their utility, and report using them infrequently (Jobes, Eyman, & Yufit, 1990; Peruzzi & Bongar, 1999). This may be because (a) most tools are time consuming to administer and (b) no one tool covers the full range of SRB risk or is appropriate for all populations. Avenues are available to address both of these concerns. In this study, we found that past SRB and diagnoses of depression (but not schizophrenia or substance abuse) are particularly strong risk factors for SRB. Several brief (5–10 minute) self-report and computer-administered tools are available to assess relevant constructs, and have demonstrated utility in predicting SRB. Among the most promising are tools for rapidly assessing suicidal ideation and intent (Beck, Steer, & Ranieri, 1998) and hopelessness (Beck, Steer, Kovacs, & Garrison, 1985).

Patients' responses to these brief instruments can be considered in light of information obtained through the clinical interview. We recommend that the interview be structured so that clinicians consider a consistent set of risk factors. These risk factors can systematize essential areas of inquiry for semi-structured interviews, improving the reliability and validity of assessments without forcing an untenable ''one size fits all'' approach. Research on psychiatric diagnosis (e.g. Luria & Guziec, 1981) and forensic assessment (Nicholson & Kugler, 1992) indicates that clinical judgment is more reliable when it is structured by tools that focus on the precise issue than when it is based on a ''seat of the pants'' interview. The results of this study specify demographic, clinical, and contextual risk factors for SRB that could easily be integrated with, or developed into, simple clinical guides (see, e.g., Packman, Marlitt, Bongar, & Pennuto, 2004). When there is past SRB, the interview should briefly cover areas of inquiry outlined in such tools as the ''Risk-Rescue'' rating scale by Weisman and Worden (1972) (see ''Method'' above) to assess the intent associated with the self-harm, as well as the nature and lethality of past attempts. Such inquiries may prove critical. Even among those with repeated SRB, those with increasing intent over time are more likely to complete suicide (Scorro, Marietta, Tonietto, Dello Buona, & De Leo, 2000).

These risk assessment approaches may help clinicians target their interventions—including more frequent contact—to the groups at highest risk. Our finding that patients with recent SRB receive relatively intensive treatment after hospital discharge suggests that, at least at a global level, clinicians' brief risk assessments are on track. The use of brief self-report scales to assess suicidality and hopelessness, in combination with a semi-structured interview, may fine-tune these assessment procedures.

Third, the present results have implications for risk management. There is evidence that intensive treatment efforts are necessary for high-risk patients. Several studies reviewed earlier indicate that the risk of suicide (if not SRB *per se*) is highest immediately following hospital discharge. Moreover, patients' risk of suicide significantly increases when their provider is unavailable (King et al., 2001). This

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

suggests that targeted risk assessment and treatment efforts for high-risk patients make a difference. The present data clearly suggest that efforts to minimize SRB should be sustained for at least one year after discharge, given that we found no diminution in risk over that period.

REFERENCES

Beautrais, A. (2001). Suicides and serious suicide attempts: Two populations or one? *Psychol Med, 31*, 837–845.

Beautrais, A., Joyce, P., & Mulder, R. (1999). Personality traits and cognitive styles as risk factors for serious suicide attempts among young people. *Suicide Life Threat Behav, 29*, 37–47.

Beautrais, A., Joyce, P., & Mulder, R. (2000). Unmet need following serious suicide attempt: Follow-up of 302 individuals for 30 months. In G. Andrews, & S. Henderson (Eds.), *Unmet need in psychiatry* (pp. 245–255). New York, NY: Cambridge University Press.

Beautrais, A., Joyce, P., Mulder, R., Fergusson, D., Deavoll, B., & Nightingale, S. (1996). Prevalence and comorbidity of mental disorders in persons making serious suicide attempts: A case–control study. *Am J Psychiatry, 153*, 1009–1014.

Beck, A., Schuyler, D., & Herman, I. (1974). Development of the Suicidal Intent Scales. In A. Beck, H. Resnik, & D. Lettieri (Eds.), *The prediction of suicide* (pp. 45–69). Philadelphia, PA: Charles.

Beck, A. T., Steer, R. A., Kovacs, M., & Garrison, B. (1985). Hopelessness and eventual suicide: A 10-year prospective study of patients hospitalized with suicidal ideation. *Am J Psychiatry, 14*, 559–563.

Beck, A. T., Steer, R. A., & Ranieri, W. (1998). Scale for Suicide Ideation: Psychometric properties of a self-report version. *J Clin Psych, 44*, 499–505.

Bongar, B. (2002). *The suicidal patient: Clinical and legal standards of care* (2nd ed.). Washington, DC: American Psychological Association.

Bostwick, J. M., & Pankratz, S. (2000). Affective disorders and suicide risk: A re-examination. *Am J Psychiatry, 157*, 1925–1932.

Brent, D., Kolko, D., Birmaher, B., Baugher, M., & Bridge, J., (1999). A clinical trial for adolescent depression: Predictors of additional treatment in the acute and follow-up phases of the trial. *J Am Acad Child Adolesc Psychiatry, 38*, 263–271.

Brown, G., Beck, A., Steer, R., & Grisham, J. (2000). Risk factors for suicide in psychiatric outpatients: A 20-year prospective study. *J Consult Clin Psychol, 68*, 371–377.

Centers for Disease Control and Prevention. (2004). *Nonfatal Self-Inflicted Injuries Treated in Hospital Emergency Departments—United States, 2000*. Retrieved November 18, 2004, from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5120a3.htm.

Cohen, S., Karmarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *J Health Soc Behav, 24*, 385–396.

Cooper, J., Kapur, N., Webb, R., Lawlor, M., Guthrie, E., Mackway-Jone, K., & Appleby, L. (2005). Suicide after deliberate self-harm: A 4-year cohort study. *Am Journal Psychiatry, 162*, 297–303.

Diekstra, R. F. W. (1993). The epidemiology of suicide and parasuicide. *Acta. Psychiatrica Scandinavica Supplementum, 371*, 9–20.

Duberstein, P. R., & Conwell, Y. (1997). Personality disorders and completed suicide: A methodological and conceptual review. *Clinical Psychology: Science and Practice, 4*, 369–376.

Estroff, S. E., & Zimmer, C. (1994). Social networks, social support, and violence among persons with severe, persistent mental illness. In J. Monahan, & H. Steadman (Eds.), *Violence and mental disorder: Developments in risk assessment* (pp. 259–295). Chicago, IL: University of Chicago.

Goldston, D., Daniel, S., Reboussin, D., Reboussin, B., Frazier, P., & Kelley, A. (1999). Suicide attempts among formerly hospitalized adolescents: A prospective naturalistic study of risk during the first 5 years of discharge. *J Am Acad Child Adolesc Psychiatry, 38*, 660–671.

Hall, R., Platt, D., & Hall, R. (1999). Suicide risk assessment: A review of risk factors for suicide in 100 patients who made severe suicide attempts. *Psychosomatics, 40*, 18–27.

Haw, C., Hawton, K., Houston, K., & Townsend, E. (2001). Psychiatric and personality disorders in deliberate self-harm patients. *Brit J Psychiatry, 178*, 48–54.

Hjelmeland, H. (1996). Repetition of parasuicide: A predictive study. *Suicide Life Threat Behav, 26*, 395–404.

Hjelmeland, H., Hawton, K., Nordvik, H., Bille-Brahe, U., De Leo, D., Fekete, S., Grad, O., Haring, C., Kerkhof, A. J., Loennqvist, J., Michel, K., Renberg, E., Schmidtke, A., Van Herringen, K., & Wasserman, D. (2002). Why people engage in parasuicide: A cross-cultural study of intentions. *Suicide Life Threat Behav, 32*, 380–393.

Hollingshead, A., & Redlich, F. (1958). *Social class and mental illness: A community study*. Oxford: Wiley.

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

Janca, A., & Helzer, J. (1990) DSM III-R criteria checklist. *DIS Newsletter, 7*, 17.
Jobes, D. A., Eyman, J. R., & Yufit, R. I. (1990, April). Suicide risk assessment survey. Paper presented at the Annual meeting of the American Association of Suicidology, New Orleans, LA.
Kessel, N., & McCulloch, W. (1966). Repeated acts of self-poisoning and self-injury. *Pro R Soc Med, 59*, 89–92.
Kessler, R., Borges, G., Walters, E. (1999). Prevalence of and risk factors for lifetime suicide attempts in the national comorbidity survey. *Arch Gen Psychiatry, 56*, 617–626.
King, E., Baldwin, D., Sinclair, J., Baker, N., Campbell, M., & Thompson, C. (2001). The Wessex Recent In-patient suicide study, I: Case–control study of 234 recently discharged psychiatric patient suicides. *Brit J Psychiatry, 178*, 531–536.
Luria, R., & Guziec, R. (1981). Comparative descriptions of the SADS and PSE. *Schz Bull, 7*, 248–257.
Maris, R. W., Berman, A., & Silverman, M. (2000). *Comprehensive textbook of suicidology*. New York: Guilford.
McCaig, L. F., & Ly, N. (2001). National Hospital Ambulatory Medical Care Survey: 2000 emergency department summary. *Advance Data, 22*, 1–32.
McKenzie, W., & Wurr, C. (2001). Early suicide following discharge from a psychiatric hospital. *Suicide and Life Threatening Behavior, 31* 358–363.
Minino, A., Arias, E., Kochanek, K., Murphy, S., & Smith, B. (2002). Deaths: Final data for 2000. *National Vital Statistics Reports, 50*, 15.
Monahan, J., Steadman, H., Silver, E., Appelbaum, P., Robbins, P., Mulvey, E., Roth, L., Grisso, T., & Banks., S. (2001). *Rethinking risk assessment: The MacArthur Study of Mental Disorder and Violence*. New York: Oxford University Press.
Nicholson, R. A., & Kugler, K. E. (1991). Competent and incompetent criminal defendants: A quantitative review of comparative research. *Psych Bull, 109*, 355–370.
O'Carroll, P. W., Berman, A. L., Maris, R. W., Moscicki, E. K., Tanney, B. L., & Silverman, M. M. (1996). Beyond the Tower of Babel: A nomenclature for suicidology. *Suicide Life Threat Behav, 26*, 237–252.
Overall, J. E., & Gorham, D. R. (1962). The Brief Psychiatric Rating Scale. *Psychol Rep 10*, 799–812.
Packman, W. L., Marlitt, R., Bongar, B., & Pennuto, T. O. (2004). A comprehensive and concise assessment of suicide risk. *Behavioral Sciences and the Law, 22*, 667–680.
Peruzzi, N., & Bongar, B. (1999). Assessing risk for completed suicide in patients with major depression: Psychologists' views of critical factors. *Professional Psychology: Research and Practice, 30*, 576–580.
Platt, S. D. (1984). Unemployment and suicidal behaviour: A review of the literature. *Soc Sci Med, 19*, 93–115.
Platt, S., Bille-Brahe, U., Kerkhof, A., Schmidtke, A., Bjerke, T., Crepet, P., De Leo, D., Haring, C., Lönnqvist, J., Michel, K., Philippe, A., Pommereau, X., Querejeta, I., Salander-Renberg, E., Temesvary, B., Wasserman, D., & Sampaio Faria, J. (1992). Parasuicide in Europe: The WHO/EURO multicentre study on parasuicide. I. Introduction and preliminary analysis for 1989. *Acta Psych Scand, 85*, 97–104.
Pokorny, A. D., Kaplan, H., & Lorimor, R. (1983). Effects of diagnosis and treatment history on relapse of psychiatric patients. *Am J Psychiatry, 140*, 1598–1601.
Range, L. M., & Knott, E. C. (1997). Twenty suicide assessment instruments: Evaluation and recommendations. *Death Stud 21*, 25–58.
Roy, A. (1982). Risk factors for suicide in psychiatric patients. *Arch Gen Psychiatry, 39*, 1089–1095.
Rush, M. J., Kashdan, T., Pollack, S., & Bajmakovic-Kacila, S. (1999). Assessment of suicide risk 24 hours after psychiatric hospital admission. *Psych Ser, 50*, 1491–1493.
Schmidtke, A., Bille-Brahe, U., DeLeo, D., Kerkhof, A., Bjerke, T., Crepet, P., Haring, C., Hawton, K., Lonnqvist, J., Michel, K., Pommereau, X., Querejeta, I., Phillipe, I., Salander-Renberg, E., Temesvary, B., Wasserman, D., Fricke, S., Weinacker, B., & Sampaio-Faria, J. G. (1996). Attempted suicide in Europe: Rates, trends and sociodemographic characteristics of suicide attempters during the period 1989-1992. Results of the WHO/EURO Multicentre Study on Parasuicide. *Acta Psych Scand, 93*, 327–338.
Scorro, P., Marietta, P., Tonietto, M., Dello Buono, M., & De Leo, D. (2000). The role of psychopathology and suicidal intention in predicting suicide risk: A longitudinal study. *Psychopathology, 33*, 143–150.
Silver, E. (2002). Mental disorder and violent victimization: The mediating effect of involvement in conflicted social relationships. *Criminology, 40*, 191–212.
Stanley, B., Gameroff, M. J., Michalsen, V., & Mann, J. J. (2001). Are suicide attempters who self-mutilate a unique population? *Am J Psychiatry, 158*, 427–432.

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl

Steadman, H. J., Mulvey, E. P., Monahan, J., Robbins, P. C., Appelbaum, P. S., Grisso, T., Roth, L. H., & Silver, E. (1998). Violence by people discharged from acute psychiatric inpatient facilities and by others in the same neighborhoods. *Arch Gen Psychiatry, 55*, 393–401.

Suominen, K., Henriksson, M., Suokas, J., Isometsa, E., Ostamo, A., & Lonnqvist, J. (1996). Mental disorders and comorbidity in attempted suicide. *Acta Psych Scand, 94*, 234–240.

Swartz, M. S., Swanson, J. W., Wagner, H. R., Burns, B. J., Hiday, V. A., & Borum, R. (1999). Can involuntary outpatient commitment reduce hospital recidivism? Findings from a randomized trial with severely mentally ill individuals. *Am J Psychiatry, 156*, 1968–1975.

Weisman, A. D., & Worden, J. W. (1972). Risk–rescue rating in suicide assessment. *Arch Gen Psychiatry, 26*, 553–560.

Welch, S. (2001). A review of the literature on the epidemiology of parasuicide in the general population. *Psychiatr Serv, 52*, 368–375.

World Health Organization. (2004). *Violence and health: Report by the Secretariat* Retrieved January 2, 2004, from http://www.who.int/gb/ebwha/pdf_files/EB109/eeb10915.pdf

Copyright © 2006 John Wiley & Sons, Ltd.

DOI: 10.1002/bsl