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# A controlled comparison trial of the Collaborative Assessment and Management of Suicidality (CAMS) in an inpatient setting: Outcomes at discharge and six-month follow-up

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ABSTRACT

This controlled comparison trial evaluated a suicide-specific intervention, the Collaborative Assessment and Management of Suicidality (CAMS), in an extended-stay psychiatric inpatient setting. Multiple outcomes were examined for 104 patients, half of whom received individual therapy from therapists trained in CAMS. The comparison group was selected from a larger pool through Propensity Score Matching to ensure comparability on age, sex, treatment program, number of prior suicide attempts, and severity of suicidal ideation. Results showed that a) all patients improved significantly across a wide range of measures, including depression, suicidal ideation, functional disability, and well-being; b) these gains were durable over a 6-month post-discharge period; and c) patients treated by a CAMS-trained individual therapist improved significantly more from admission to discharge across all measures. Differences between CAMS and non-CAMS patients were no longer statistically significant at 6-month follow-up, although statistical power was compromised due to attrition. Although replication studies are needed, these findings suggest that interventions specifically tailored for suicidal patients may have advantages compared to usual, intensive inpatient treatment, perhaps by addressing psychological vulnerabilities specific to the population. The lack of significant differences at follow-up suggest that post-treatment contact may be needed to maintain advantages associated with this and similar interventions.

## 1. Introduction

The Joint Commission recently issued Sentinel Event Alert 56, "Detecting and Treating Suicide Ideation in All Settings," urging all health care organizations to integrate evidence-based components of effective care for individuals at risk for suicide (The Joint Commission, 2016). Among these are "treatment and discharge plans that directly target suicidality," including suicide-specific psychotherapies. Although the recommendation may seem self-evident, this development is a milestone to the extent that it furthers movement in the field past traditional views of suicidality as a symptom of illness and toward viewing suicidal ideation and behavior as a primary treatment issue warranting specialized intervention.

Indeed, recent developments in clinical suicidology have provided evidence of significant progress toward this vision. Recent years have seen increasing recognition of psychological features, such as hopelessness, cognitive rigidity, and deficient problem-solving, that distinguish individuals with suicidality from other psychiatric patients (Ellis, 2006), along with the potential for psychotherapeutic interventions focused on those features. Therapies with growing bodies of empirical support for effectiveness in reducing suicidal behaviors include Dialectical Behavior Therapy (DBT; Linehan et al., 2006), brief cognitive-behavior therapy (Rudd et al., 2015), Cognitive Therapy for Suicide Prevention (Wenzel, A.; Brown, G.K.; Beck, 2009), and mentalization-based therapy (Bateman and Fonagy, 2009, 2008). In randomized controlled trials, these interventions consistently have been shown to reduce risk of further suicidal behaviors by 50–60% compared even to enhanced usual care.

Also on the list of emerging interventions for suicidal patients is the Collaborative Assessment and Management of Suicidality (CAMS; Jobes, 2016, 2012). CAMS has shown promise in a variety of settings, including college counseling centers, (Jobes and Jennings, 2011; Jobes et al., 1997), an outpatient community mental healthcare setting (Comtois et al., 2011), a military treatment setting (Jobes et al.,

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2005), and with outpatients with borderline personality disorder traits (Andreasson et al., 2016).

All of the aforementioned interventions have been developed and tested primarily in outpatient environments. However, inpatient care remains a mainstay of psychiatric treatment for suicidal individuals, and is *de facto* standard of care in cases where patients are considered at acute risk (Jacobs et al., 2010). This remains the case despite growing awareness of a disconnect between accepted treatment protocols and empirical evidence of effectiveness in reducing or preventing suicidal behavior. Linehan comments, "The belief that hospitalization saves lives is appealing but is, none-the-less, an untested assumption" (Linehan, 2008, p. 483). This view is echoed in the 2002 report of the Institute of Medicine, which described the evidence that brief hospitalization is effective against suicide as "questionable" (Institute of Medicine, 2002, p. 7–16). The American Psychiatric Associations guidelines on the treatment of suicidal patients is even more blunt in reminding practitioners that, "Hospitalization, by itself, is not a treatment" (Jacobs et al., 2010, p. 52). Perhaps Ghahramanlou-Holloway and associates summed it up best by observing, "Given that hospitalization [for suicidality] continues despite little to no evidence supporting [its value in preventing suicide], the development of effective inpatient treatments for preventing suicide attempts is considered a significant national suicide prevention objective" (Ghahramanlou-Holloway et al., 2015, p. 93).

We are aware of two efforts to extend successes in the outpatient treatment of suicidal individuals to the inpatient environment. Ghahramanlou-Holloway and associates have published a series of papers describing their development of Post-Admission Cognitive Therapy (PACT), an effort to modify cognitive therapy for suicidal patients (Wenzel et al., 2009) for use in an acute care psychiatric setting. This protocol has been described in detail (Ghahramanlou-Holloway et al., 2012), and at this writing is being evaluated in a well-powered randomized clinical trial.

Similarly, although CAMS initially was developed for use in outpatient settings, we have recently endeavored to adapt and evaluate it for use with psychiatric inpatients. The current paper adds to a series of papers on CAMS at The Menninger Clinic, an extended stay psychiatric hospital. Earlier papers have described the adaptation and implementation process (Ellis et al., 2009), provided a detailed treatment protocol (Ellis et al., 2012a), described results of an open pilot trial (Ellis et al., 2012b), and reported outcomes of a small controlled comparison trial (Ellis et al., 2015).

### 1.1. What is CAMS?

Introduced by D. Jobes in 2004 (Jobes and Drozd, 2004), CAMS does not stipulate a particular therapeutic orientation; rather, it is a structured, collaborative framework for alliance-building, risk assessment, case formulation, treatment planning, and risk reduction with suicidal patients. Special emphasis is placed on cultivating a spirit of collaboration with the patient on tasks such as developing a shared understanding of the suicidal process and planning for stabilization, both during treatment and afterwards. It also directly addresses specific psychological vulnerabilities to suicidality, such as hopelessness and self-hatred, as well as problems jointly identified as directly connected with suicidality.

CAMS is a suicide-specific intervention, in that it conceptualizes suicidality as a primary problem and treatment focus, regardless of clinical diagnosis. The CAMS model thus stipulates that suicidal ideation and behavior are kept center stage until suicidality is resolved. A major agenda item is achieving a shared understanding of how the suicidal experience unfolds for the patient, in terms of the contributing psychological factors and typical situational triggers, cognitions, impulses, behaviors, and emotions. Particular attention is paid to patient-defined suicide "drivers," that is, problems that induce the patient to consider suicide (Jobes, 2016; Tucker et al., 2015). Treatment is thus focused on problem solving to address drivers, as well as on the development of skills and techniques that provide alternatives to suicidality as a coping response.

Within the CAMS framework, a full range of clinical techniques can be employed to promote alternate coping responses in the pursuit of a post-suicidal life defined by purpose and meaning. A variety of interventions is used to these ends; clinicians' own techniques or others borrowed from DBT, cognitive therapy, psychodynamic psychotherapy, mindfulness, and other approaches may be employed, including coping cards, chain analysis, safety planning, a Hope Kit, and other self-soothing techniques (Linehan, 1993; Wenzel et al., 2009).

In this paper, we report results from a continuation study that doubles the sample size of our previous study (Ellis et al., 2015) and adds post-discharge follow-up data. Specifically, we seek here to assess the impact of CAMS on both general and suicide-specific measures relative to a matched comparison group, and to examine outcomes following hospital discharge. Because of the substantial overlap between the two treatment conditions (see below), we felt it appropriate to approach the study as a test of the null hypothesis, namely, that outcomes among patients treated by CAMS-trained therapists would not differ significantly from those of patients in the usual treatment condition.

## 2. Method

### 2.1. Setting

The Menninger Clinic is a private, not for profit, 100-bed psychiatric hospital in Houston, Texas, specializing in the treatment of patients with complex, treatment resistant-disorders. This is an extended-stay facility, with an average length of stay of six to seven weeks. Patients at this facility typically suffer from multiple mood, anxiety, substance-related, and personality disorders, and have obtained unsatisfactory response to multiple prior medical and/or psychological treatments. Approximately 60% of patients are from other states or countries. Treatment includes general medical assessment and treatment, pharmacotherapy, individual and group psychotherapy, psycho-educational groups, family work, leisure-time social/recreational activities and discharge planning, as well as patient-selected activities such as pastoral counseling and yoga. These interventions are employed in the context of a therapeutic milieu that includes continuous nursing care as well as patient government and ample opportunity for spontaneous interactions among patients. Data for this study were aggregated from three adult treatment programs, including one for young adults, one for professionals in crisis, and one for adults with relatively chronic disorders.

### 2.2. Participants

The present study included 104 participants ranging from 18 to 70 years of age ($M$ =32.18, $SD$ =14.19). Most participants (64.4%) were female, and a large majority (93.3%) were white. Participants were well educated, generally speaking, with 38.5% indicating "some college," 34.8% reporting a Bachelor's or graduate degree, and about one-fourth reporting a high school education or less. The average length of stay for the present sample was 59.5 days. All individuals in the current study reported some form of suicidality (ideation or attempts) within two months prior to admission. The number of reported lifetime suicide attempts ranged from zero to nine ($M$ =1.69, $SD$ =1.88); 32 patients (30.8%) reported no lifetime attempts, 27 (26.0%) reported one attempt, and 45 (43.3%) reported multiple attempts.

### 2.3. Measures

In considering study measures, we set out to select instruments with established reliability and validity that would provide us with

sound information about suicidality during and after treatment, as well as possible predictors of outcomes. Measures also were selected to permit investigation of mechanisms of change (reported separately: Rufino and Ellis, in press).

#### 2.3.1. Columbia-Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011)

This is a clinician-administered rating scale measuring past and current suicidal ideation and behavior. It measures four constructs: severity, intensity, behavior, and lethality, and includes items that assess frequency, duration, and controllability of ideations. It has shown excellent internal reliability and good convergent and divergent validity. The instrument developers reported predictive validity in that baseline C-SSRS ratings significantly predicted attempts during treatment with an odds ratio of 1.45 (Posner et al., 2011). They also reported significant sensitivity to change across various constructs (Posner et al., 2011). A recent psychometric investigation indicated solid psychometric properties with the C-SSRS in an inpatient psychiatric sample (Madan et al., 2016).

#### 2.3.2. Patient Health Questionnaire-9 (PHQ-9; Spitzer et al., 1999)

This is a 9-item self-report measure assessing the presence of depressive symptoms in the prior two weeks, via 4-point Likert-type answer choices ranging from “not at all” to “nearly every day.” The PHQ-9 includes items that assess mood, sleep, appetite, concentration, and anhedonia, and is considered a reliable and valid measure of depressive symptoms (Lowe et al., 2004a). Psychometric assessment indicated good sensitivity to change (Cameron et al., 2008). The PHQ-9 has been found to predict suicides and suicide attempts among outpatients in treatment for depression after one year (Simon et al., 2013).

#### 2.3.3. Beck Scale for Suicide Ideation (BSS; Beck and Steer, 1991)

This is a self-report instrument consisting of 21 sets of statements containing content such as wish to live, wish to die, frequency of ideation, reasons for living, access to means, and perceived capability to carry out an attempt. Statements within each item are graded according to severity and scored from 0 to 2. Possible scores range from 0 to 38 (a sum of the 19 items included in the total). The BSS is widely used in suicide research and has demonstrated predictive validity for suicide attempts and deaths by suicide (Brown et al., 2006).

#### 2.3.4. Beck Hopelessness Scale (BHS; Beck and Steer, 1988)

This is a 20-item self-report instrument designed to measure negative future thinking. Items are endorsed as true or false, with approximately half of the items reverse coded. The BHS includes items such as “I just can’t get breaks, and there's no reason I will in the future” and “My future seems dark to me.” Hopelessness as measured by the BHS has been shown to be a key mediator between depression and suicidal ideation, and has demonstrated predictive validity for death by suicide (Brown et al., 2006) and attempts at three month follow up (Young et al., 1996).

#### 2.3.5. Suicide Cognitions Scale (SCS; Bryan et al., 2014; Ellis and Rufino, 2015)

This is a self-report instrument consisting of 18 items that are rated on a 5-point scale according to strength of belief. The items were constructed to be consistent with the suicidal schemas of unbearability (e.g., “I can’t cope with my problems any longer”) and unlovability (e.g., “There is nothing redeeming about me”). The instrument is scored by summing ratings across items, resulting in a range of possible scores from 18 to 90. Studies have shown that the SCS predicts suicidal ideation independent of depression and hopelessness (Ellis and Rufino, 2015) and predicts future suicide attempts above and beyond other risk factors over a two year follow up period (Bryan et al., 2014).

#### 2.3.6. Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011)

This is a seven-item self-report instrument assessing experiential avoidance/psychological flexibility. Item statements are rated on a 7-point Likert-type scale with choices ranging from “never true” to “always true.” The AAQ-II has demonstrated strong reliability and validity across many samples and settings (Bond et al., 2011). Sample items include, “Worries get in the way of my success,” and “Emotions cause problems in my life.” Scores on the AAQ-II are associated with a wide variety of outcomes, from mental health difficulties such as depression and anxiety to work absence rates (Bond et al., 2011). Furthermore, change in AAQ-II scores is known to be associated with change in suicidal ideation, independent of depression and hopelessness (Ellis and Rufino, 2016).

#### 2.3.7. WHO-5 Well-Being Index (WHO-5; Topp et al., 2015)

This is a five item self-report instrument assessing positive quality of life, in a deliberate attempt to avoid symptom related terminology. Sample items include “I have felt cheerful and in good spirits” and “My daily life has been filled with things that interest me.” Item statements are rated on a 6-point Likert-type scale with answer choices ranging from “At no time” to “All of the time.” Prior research has found support for the psychometric properties of the WHO-5 (Bech et al., 2003; Lowe et al., 2004b). The instrument has been shown to be sensitive to change in a variety of contexts, and has shown predictive validity at 6 years (Topp et al., 2015). At least one study (in international context) has indicated strong predictive validity specifically with respect to suicidal ideation (Awata et al., 2007).

#### 2.3.8. WHO Disability Assessment Schedule 2.0 (WHODAS; Ustun et al., 2010)

This is a 12-item self-report measure that covers the six domains of functioning, including self-care, cognition, life activities, mobility, participation, and getting along with others. Participants are asked to rate how much difficulty they had with each task. Options are rated on a 5-point Likert-type scale ranging from “None” to “Extreme or cannot do.” Sample items include “Getting dressed” and “Maintaining a friendship.” Respondents are then asked to tally the number of days they were unable to carry out their usual activities or had to cut back due to a health condition. The WHODAS has exhibited strong validity and reliability and has similar sensitivity to change as comparable measures of functioning (Ustun et al., 2010).

### 2.4. Procedures

This study was approved by the Institutional Review Board of Baylor College of Medicine, with the oversight of a Data Safety Monitoring Board. Eligibility for participation was determined by patients’ responses to the C-SSRS, which is administered routinely to Menninger patients as part of baseline and follow-up assessments. Patients were invited into the study if they reported experiencing any of the following within two months prior to admission: frequency of suicidal ideation 2–5 times a week or more, duration of suicidal ideation 1–4 h or more, controllability of ideation endorsed as “with a lot of difficulty” or “unable to control,” or if they reached the threshold of “suicidal ideation with or without a plan” on an incremental ideation scale of the C-SSRS. Patients with active psychosis or cognitive impairment (assessed by clinician review of each patient's psychiatric and psychological evaluations) were excluded. Patients who met inclusion criteria were approached and invited to participate in the study. Among patients approached, 82% consented to participate. Among those declining to participate, the main reason cited was the additional time requirement. Following consent, the remaining measures were administered at admission, at two-week intervals, and prior to discharge. Post-discharge outcome measures were administered by telephone by the second author.

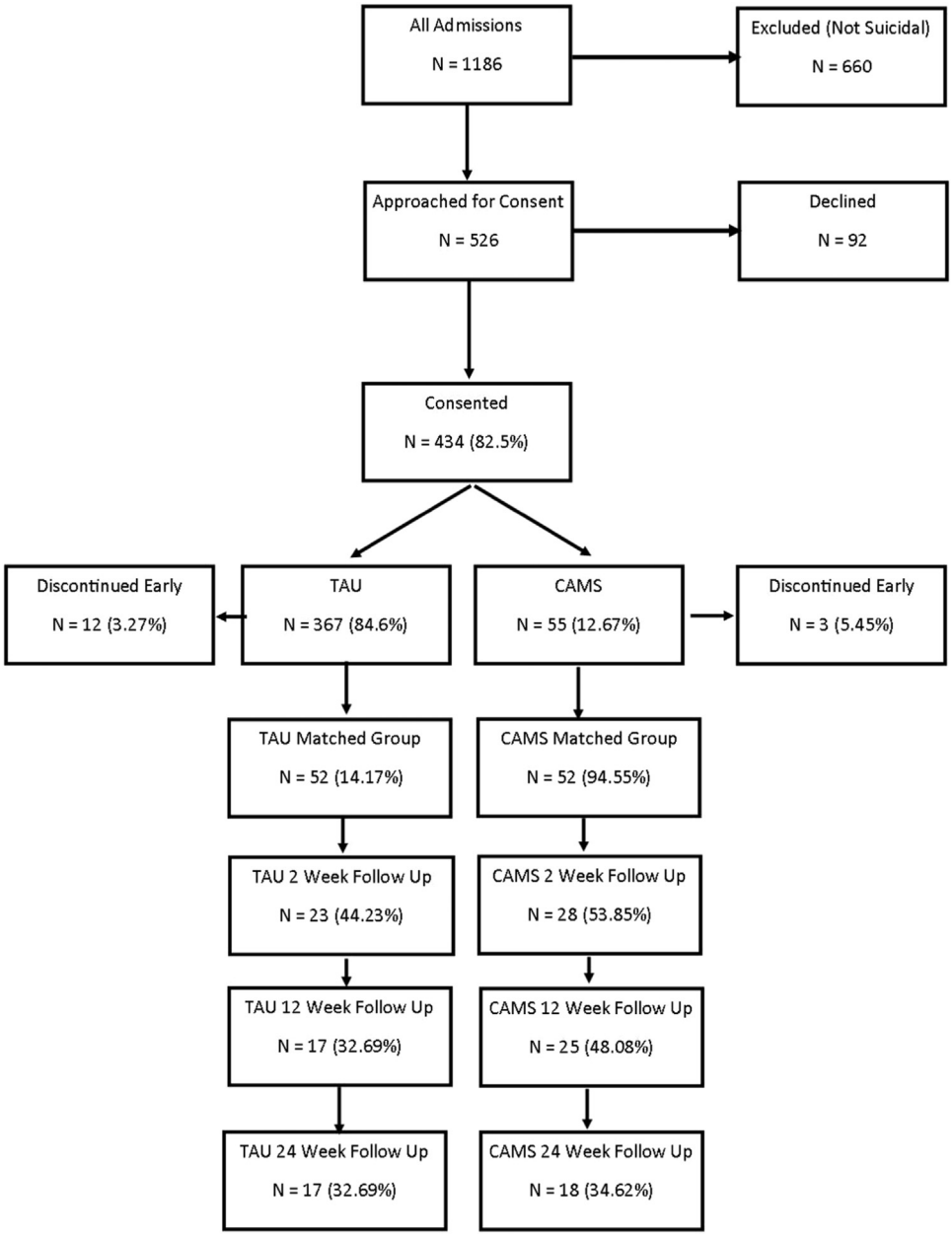


**Fig. 1.** CONSORT table.

Study therapists were licensed clinical social workers and doctoral-level psychologists employed at The Menninger Clinic. The theoretical orientations of therapists at The Menninger Clinic vary, but can be described generally as eclectic with a psychodynamic foundation, although some are more inclined toward cognitive-behavioral strategies. A post-hoc analysis revealed no significant differences in therapeutic approach or professional discipline between the CAMS and treatment as usual (TAU) groups. Study therapists received training from CAMS creator David Jobes and were required to submit videotapes for fidelity checks at Dr. Jobes' laboratory in order to qualify as study therapists. In addition to formal training and independent reading, study therapists also participated in a monthly peer supervision group, where the first author presented didactic material and facilitated discussion of issues encountered in ongoing CAMS cases. Fidelity checks via routine audio or video recordings were not feasible in this clinical setting.

#### 2.4.1. Treatment conditions

This was a nonrandomized, naturalistic, controlled comparison study (See Fig. 1 for CONSORT diagram). Group membership was determined via clinical referrals made through a combination of request by the patient's treatment team and availability of a CAMS-trained therapist at the time of referral for individual therapy. All study participants received intensive inpatient treatment, as described earlier. Among other interventions, the hospital plan of care includes two 50-min individual psychotherapy sessions per week. The treatment conditions for this study differed only in that patients in the CAMS condition received individual therapy from a therapist trained in a version of CAMS adapted for use at the Menninger Clinic (Ellis et al., 2012b). Entry into this study required a minimum of 4 CAMS sessions; actual session numbers ranged from 6 to 30 ($M$ =15.25, $SD$ =5.33).

### 2.5. Data analysis

Propensity Score Matching (PSM) was used to match the two groups based on a propensity, or balancing, score, so the distribution of baseline covariates was similar between groups. Once the groups were matched based on the propensity score, treatment effects could be directly compared, ensuring results were associated with treatment, not to baseline confounds (Austin, 2011).

The use of PSM has increased substantially in recent years. A review by Stürmer and colleagues (Stürmer et al., 2006) found a total of 8 published studies using propensity scores prior to 1998; however, that number increased to 71 in 2003 alone. This methodology was originally more popular in a traditional medical model (Stürmer et al., 2006); however, it has recently gained popularity among psychiatric (Hansen et al., 2012; Marangell et al., 2008) and psychotherapy treatment researchers as well (Bartak et al., 2009; Barth et al., 2007; Ye and Kaskutas, 2009).

## 3. Results

PSM was used to match the CAMS and TAU groups on demographic and clinical variables that might potentially confound outcome comparisons. The groups were therefore matched for age, sex, and hospital unit (unit matching ensured that roughly equal numbers of participants came from each of three differing treatment programs within the hospital). The groups also were matched for suicide severity at admission and number of prior suicide attempts. Descriptive statistics for each of these variables are shown in Table 1. The PSM procedure resulted in groups that were diagnostically comparable (Table 2), with mood disorders and personality disorders most prevalent. As expected, co-morbidity was universal in this group of patients.

Consistent with the PSM, comparisons of scores obtained at admission revealed no significant differences between the CAMS and TAU groups for any of the control variables, including age [$F(1,103) = 0.281$, $p = 0.597$], sex [$\chi^2(1) = 0.042$, $p = 0.838$], treatment unit [$\chi^2(2) = 1.413$, $p = 0.493$], number of prior attempts [$F(1,103) = 0.174$, $p = 0.678$], or ideation intensity [$F(1,103) = 0.374$, $p = 0.542$]. Comparison of the two matched groups on outcome measures revealed no significant differences at admission; these included suicidal ideation (BSS) [$F(1,103) = 0.697$, $p = 0.406$], suicidal cognitions (SCS): [$F(1,103) = 3.781$, $p = 0.055$], depression severity (PHQ-9): [$F(1,103) = 0.329$, $p = 0.567$], and experiential avoidance (AAQ-II): [$F(1,103) = 1.189$, $p = 0.278$]. The only significant difference on an outcome measure at admission was higher hopelessness in the TAU group ($M = 15.15$) relative to CAMS ($M = 12.62$) [$F(1,103) = 7.275$, $p > 0.01$].

**Table 1**
Descriptive statistics on matching variables.

| | CAMS | | TAU | |
|---|---|---|---|---|
| | *n* | *M (SD)* | *n* | *M (SD)* |
| Gender | | | | |
| Female | 33 | | 33 | |
| Male | 18 | | 19 | |
| Transgender | 1 | | 0 | |
| Age | | 31.44 (13.91) | | 32.92 (14.56) |
| Previous Attempts | | 1.77 (1.78) | | 1.61 (1.98) |
| Ideation Intensity (C-SSRS) | | 15.92 (4.93) | | 16.46 (4.00) |
| Treatment Unit | | | | |
| PIC | 9 | | 14 | |
| HOPE | 13 | | 12 | |
| Compass | 30 | | 26 | |

Note. C-SSRS=Columbia Suicide Severity Rating Scale; PIC=Professionals in Crisis program; HOPE=Hope Program for Adults; Compass=Compass Program for Young Adults.

**Table 2**
Diagnostic frequencies and comparisons between groups.

| | CAMS ($n$ =52) *N* (%) | TAU ($n$ =52) *N* (%) | $\chi^2$ | *p* |
|---|---|---|---|---|
| MDD Recurrent | 27 (51.9%) | 35 (67.3%) | 2.556 | 0.110 |
| Social Phobia | 9 (17.3%) | 10 (19.2%) | 0.064 | 0.800 |
| GAD | 10 (19.2%) | 14 (26.9%) | 0.867 | 0.352 |
| PTSD | 12 (23.1%) | 10 (19.2%) | 0.231 | 0.631 |
| Anxiety Disorder NOS | 9 (17.3%) | 10 (19.2%) | 0.064 | 0.800 |
| EDNOS | 10 (19.2%) | 11 (21.2%) | 0.060 | 0.807 |
| Avoidant PD | 18 (34.6%) | 14 (26.9%) | 0.722 | 0.395 |
| OCPD | 7 (13.5%) | 10 (19.2%) | 0.633 | 0.426 |
| BPD | 17 (32.7%) | 18 (34.6%) | 0.043 | 0.836 |

Note. CAMS=Collaborative Assessment and Management of Suicidality; TAU=treatment as usual; MDD=major depressive disorder; GAD=generalized anxiety disorder; PTSD=post-traumatic stress disorder; EDNOS=eating disorder, not otherwise specified; PD=personality disorder; OCPD=obsessive-compulsive personality disorder; BPD=borderline personality disorder.

Examination of pre-hospitalization variables also revealed no statistically significant differences between groups. However, consistent trends were noted toward greater impairment among CAMS patients, in that patients in the CAMS condition tended to have seen a greater number of therapists ($M = 5.54$, $SD = 6.63$) than TAU patients ($M = 4.77$, $SD = 4.33$), to have seen a greater number of psychiatrists ($M = 4.54$, $SD = 7.71$) compared to TAU ($M = 3.44$, $SD = 2.08$), to have missed more days of work due to psychiatric or emotional problems ($M = 8.42$, $SD = 16.18$) relative to TAU ($M = 6.18$, $SD = 12.67$), and to have experienced a greater number of prior hospital admissions, both acute ($M = 2.67$, $SD = 3.34$ vs. $M = 2.08$, $SD = 2.65$) and extended stay ($M = 2.17$, $SD = 3.43$) than TAU patients ($M = 1.56$, $SD = 2.22$).

To assess the effect of treatment condition, 2×2 Mixed Model Repeated Measure ANOVAs were conducted. Results revealed significant interactions for time and treatment course for all outcome measures. Table 3 provides means, standard deviations, and Cohen's *d* effect sizes. Participants in the CAMS condition showed greater improvement over the course of hospitalization on the entire range of suicide-specific and more general symptom measures. Effect sizes in the CAMS condition were uniformly large (Cohen's d $> 0.80$; Cohen, 1988), ranging from 1.03 on the BSS to 1.77 on the C-SSRS. In contrast, effect sizes in the TAU condition ranged from small (0.20 on the BHS) to large (1.36 on the C-SSRS).

### 3.1. Post-discharge findings

Study participants, similar to all discharged Menninger patients, were contacted by telephone for administration of assessment measures at 2, 12, and 24 weeks post-discharge. (For the sake of economy, and because patterns were similar across the follow-up period, only the 24-week data are presented here.) To decrease participant burden, and in hopes of increasing retention, we dropped the BSS, BHS, and SCS from the follow-up battery, utilizing instead the standard Menninger post-discharge assessment battery, consisting of the C-SSRS, PHQ, WHO-DAS, and WHO-5 (Fowler et al., 2015). We also inquired about re-hospitalizations and suicide attempts during the follow-up period.

As depicted in the consort table (Fig. 1), approximately one-third of participants in each condition completed assessments at the 24-week time point. There was no statistically significant difference between CAMS and TAU in rates of follow-up participation ($\chi^2(1) = 0.378$, $p = 0.539$). The only significant difference between participants who completed the six month assessment and those who did not was slightly higher levels of suicidal ideation at hospital admission among those who completed follow-up ($M = 17.43$, $SD = 3.84$ vs. $M = 15.57$, $SD = 4.67$; $F(1,102) = 4.142$, $p < 0.05$). This difference was absent at the discharge time point. There were no other significant differences between follow-up completers and non-completers, including with

**Table 3**
Pre-post means comparisons on main outcome measures.

| | CAMS | | | TAU | | |
|---|---|---|---|---|---|---|
| | Admission *n* =52 *M (SD)* | Discharge *n* =52 *M (SD)* | Cohen's *d* | Admission *n* =52 *M (SD)* | Discharge *n* =52 *M (SD)* | Cohen's *d* |
| BSS | 13.75 (9.31) | 4.82 (8.02) | 1.03 | 15.06 (9.85) | 9.35 (9.63) | 0.59 |
| SCS | 53.61 (17.78) | 33.27 (16.73) | 1.18 | 59.98 (15.52) | 50.79 (16.37) | 0.58 |
| BHS | 12.62 (5.74) | 6.25 (5.78) | 1.11 | 15.15 (3.62) | 14.42 (3.83) | 0.20 |
| AAQ | 34.79 (8.78) | 24.48 (9.95) | 1.10 | 36.65 (8.57) | 33.77 (8.74) | 0.33 |
| PHQ-9 | 18.88 (5.66) | 8.83 (6.35) | 1.67 | 19.52 (5.62) | 13.73 (5.83) | 1.01 |
| Item 9 | 1.87 (1.10) | 0.52 (0.70) | 1.46 | 1.90 (1.01) | 1.08 (1.08) | 0.78 |
| C-SSRS | 15.92 (4.93) | 5.35 (6.88) | 1.77 | 16.46 (4.00) | 9.08 (6.53) | 1.36 |
| WHO5 | 5.67 (4.41) | 13.02 (5.30) | 1.51 | 4.33 (3.80) | 8.62 (4.06) | 1.09 |
| WDAS | 19.16 (9.35) | 7.58 (6.40) | 1.45 | 21.36 (11.01) | 10.81 (8.60) | 1.07 |

Note. BSS=Beck Scale for Suicide Ideation, SCS=Suicide Cognitions Scale, BHS=Beck Hopelessness Scale, AAQ=Acceptance and Action Questionnaire, PHQ-9=Patient Health Questionnaire, depression subscale, Item 9=Question 9 of the PHQ, "Thoughts that you would be better off dead or hurting yourself in some way"; C-SSRS=Columbia Suicide Severity Rating Scale, WHO5=World Health Organization Well Being Index, WDAS=World Health Organization Disability Assessment Schedule, CAMS=Collaborative Assessment and Management of Suicidality, TAU=Treatment As Usual.

**Table 4**
Comparisons of outcome measures within and between conditions at admission, discharge, and 6-month follow-up.

| | CAMS | | | TAU | | |
|---|---|---|---|---|---|---|
| | Admission *n* =52 *M (SD)* | Discharge *n* =52 *M (SD)* | 6 Months *n* =18 *M (SD)* | Admission *n* =52 *M (SD)* | Discharge *n* =52 *M (SD)* | 6 Months *n* =21 *M (SD)* |
| Depression | 18.88 (5.66)$^{ax}$ | 8.83 (6.35)$^{by}$ | 9.50 (7.82)$^{bx}$ | 19.52 (5.62)$^{ax}$ | 13.73 (5.83)$^{bz}$ | 10.53 (5.54)$^{bx}$ |
| Suicidality | 15.92 (4.93)$^{ax}$ | 5.35 (6.88)$^{by}$ | 7.00 (7.51)$^{bx}$ | 16.46 (4.00)$^{ax}$ | 9.07 (6.53)$^{bz}$ | 9.00 (5.29)$^{bx}$ |
| WHO-5 | 5.69 (4.41)$^{ax}$ | 13.02 (5.30)$^{by}$ | 16.20 (4.43)$^{bx}$ | 4.33 (3.80)$^{ax}$ | 8.62 (4.06)$^{bz}$ | 14.27 (5.55)$^{cx}$ |
| WHO-DAS | 19.16 (9.35)$^{ax}$ | 7.58 (6.41)$^{by}$ | 10.89 (7.28)$^{bx}$ | 21.37 (11.01)$^{ax}$ | 10.81 (8.60)$^{bz}$ | 10.56 (8.21)$^{bx}$ |
| Self-Harm | 1.87 (1.10)$^{ax}$ | 0.52 (0.70)$^{by}$ | 0.56 (0.86)$^{bx}$ | 1.90 (1.01)$^{ax}$ | 1.08 (1.08)$^{bz}$ | 0.82 (0.73)$^{bx}$ |

Note: Means with the same superscripts within a row are not significantly different (a, b, and c used for within-condition comparisons; x, y, and z used for between condition comparisons). Means with different superscripts within a row are significantly different at the 0.05 level, as determined by Tukey's multiple-range test. WHO-5=WHO-5 Well-Being Index; WHODAS=WHO *Disability Assessment Schedule 2.0*.

respect to age, sex, number of previous attempts, or depression, either at admission or at discharge.

For purposes of this report, we will highlight three primary follow-up findings, shown in Table 4. First, as noted earlier, patients in both groups were greatly improved at discharge relative to their presentation at admission to the hospital, as evidenced by the significant differences on all measures from admission to discharge. These included both the suicide-specific measures of interest to this study and broader symptom measures, including well-being and functional disability.

Second, patients in both groups showed remarkable maintenance of improvement over the course of the follow-up period. Admission-to-follow-up differences on outcome measures were statistically significant across the board, while discharge-to-follow-up comparisons were uniformly non-significant, reflecting durability of treatment gains. The only exception to the general discharge-to-follow-up rule was a statistically significant change (in the direction of continued *improvement*) on the WHO-5 measure (well-being) in the TAU group.

Third, the statistically significant differences observed between CAMS and TAU at discharge were not observed at 6-month follow-up. Although mean scores on most measures trended toward lower symptom severity among CAMS participants (especially at the 2-week time point), these differences did not reach the level of statistical significance. As discussed below, attrition during the follow-up phase (see Fig. 1) may have been a factor in reducing statistical power to detect between-group differences post-discharge.

During the follow-up period, we also asked about re-hospitalizations and suicide attempts since leaving the hospital. Overall, 64.4% ($n$ =67) of patients participated in the follow up during at least one time point; analysis utilizing Little's MCAR test indicated that missing data occurred completely at random ($\chi^2(67)$ =74.56, $p$=0.246). Data regarding re-hospitalization at follow up were coded conservatively. If a patient reported re-hospitalization at 2 weeks, but then completed no more follow-ups, they were coded as re-hospitalized. However, a patient was only coded in the no re-hospitalization group if they completed a 6-month follow up assessment and denied re-hospitalization. Re-hospitalization was reported by 8 CAMS patients (15.4%), compared to 4 TAU patients (7.7%). This difference was found to be statistically nonsignificant ($\chi^2(1)$ =2.070, $p$=0.150).

Suicide-related behaviors (i.e., suicides and suicide attempts) during the follow-up period were rare; one death by suicide occurred in each group during the 6 months following discharge. Two suicide attempts occurred in the CAMS group during follow-up, compared to none in the TAU group. Between-group differences in suicide-related behaviors post-discharge were found to be statistically nonsignificant ($\chi^2(1)$ =1.040, $p$=0.308.

## 4. Discussion

In this controlled comparison trial, we found that a) suicidal inpatients in both CAMS and TAU improved significantly across a wide range of measures over the course of hospitalization, b) these gains were durable over a 6-month post-discharge period, c) those patients treated by a CAMS-trained individual therapist improved significantly more from hospital admission to discharge relative to patients receiving equivalent treatment but with an individual therapist not trained in CAMS, and d) differences in outcomes favoring the CAMS intervention at discharge were no longer statistically significant at 6 months post-discharge.

With respect to outcomes at discharge, it is notable that CAMS outperformed TAU on instruments measuring, not only suicidal ideation and cognitions, but also depression severity, hopelessness,

functional impairment, subjective well-being, and psychological flexibility. This is in contrast to our pilot study of a smaller sample, which showed differences only on suicide-relevant measures (Ellis et al., 2012b). This broader impact was an unexpected finding, considering that CAMS is a suicide-specific intervention, raising questions about mechanisms of change that may have impact beyond the agenda of finding alternatives to suicide.

Findings from post-discharge assessments of both groups generally parallel those at the discharge time point, in that therapeutic gains on all variables were sustained over the follow-up period. However, the between-group differences observed at discharge were no longer statistically significant at follow-up. It is unclear at this point to what extent the loss of participants to follow-up (more than half of the sample) might have resulted in insufficient power to detect actual differences, especially at the 2-week time point, where trends were observed in favor of CAMS. Also, when examining trajectories, we noted that, on some variables, TAU patients tended to continue improving after discharge, while CAMS patients showed little change or slight deterioration, resulting in a merging of trajectories over the follow-up period.

One way of viewing these results is to conceptualize CAMS as an "accelerant" that contributes to more rapid progress for suicidal patients over the course of hospitalization, with TAU patients catching up, given additional time following discharge. This phenomenon is sometimes observed in comparisons of disorder-specific therapies compared to other active treatment conditions, such as Poulsen and colleagues' randomized study of bulimia therapies (Poulsen et al., 2014). In the present case, the time period following discharge, during which time the TAU group is "catching up," might be viewed as a CAMS "buffer zone" with a protective effect during the high-risk period known to exist for psychiatric patients immediately post-discharge (Qin and Nordentoft, 2005).

To elaborate further on the possible impact of CAMS on clinical trajectory, we would note a potentially meaningful finding in the follow-up data, namely, that re-hospitalizations and post-discharge attempts tended to occur considerably sooner in the TAU condition relative to the CAMS condition. For example, re-hospitalizations, when they occurred, came an average of 39 days after discharge in the TAU group, compared to 59 days in the CAMS group, a difference of nearly 3 weeks. Similarly, all but one of the 6 attempts in the (larger, pre-match) TAU group occurred during the first 6 weeks post-discharge, whereas all 3 of the attempts in the CAMS group occurred later than 6 weeks post-discharge. However, these were not statistically significant differences, so any suggestion of a CAMS "buffering effect" must be considered tentative until adequately powered studies test this possibility.

The observed diminishment of differences between CAMS and TAU over the follow-up period, while not apparently due to deterioration of CAMS benefits so much as continued improvement in the TAU group, raises the question of why the CAMS group did not also continue to improve over this period. While this might be viewed as a "ceiling effect," it is also important to note in this context that CAMS provides a new language and mental model of suicide that patients readily grasp, but which might also quickly diminish with the patient's return to the environment where suicidality developed initially. A natural next step in the development of the intervention might be to make available CAMS "booster" or "refresher" sessions by telephone, on-line, and/or smartphone app, to maintain a form of therapeutic alliance and to keep CAMS concepts and skills acquired in the hospital fresh and relevant to situations experienced at home. Booster sessions have been shown to improve therapeutic outcomes (Gearing et al., 2013), and evidence exists for a suicide-preventive impact for post-treatment therapeutic contact in general (Luxton et al., 2013).

### 4.1. Study limitations

While these results carry potentially important implications for the treatment of suicidal patients, several study limitations must be noted. First, The Menninger Clinic is an atypical setting with respect to the patient population (notably with respect to educational level and race/ethnic grouping) and the fact that the extended length of stay is highly unusual in the current healthcare environment. Replication in other settings with more diverse groups of patients is needed. Moreover, at this early stage, it is not clear whether length of stay was an essential aspect of CAMS's effectiveness, or whether CAMS might be effectively delivered in shorter-stay settings. It is worth noting in this regard that a very brief "dose" of CAMS in an outpatient community mental health setting produced significant advantages to patients randomized to that condition at 12-month follow-up compared to TAU (Comtois et al., 2011).

A further limitation to this study was the loss to follow-up of over half of the participants consented to the study. A posthoc power analysis utilizing GPower revealed that while power was still relatively strong at the two week follow up (0.72), it had fallen by the six month follow up (0.57). While not unusual in studies of this nature, representativeness of the follow-up sample remains an important issue. It is worth noting here that, when examined overall, 64.4% ($n$ =67) of patients participated in the follow up during at least one time point (For detailed breakdown, see Fig. 1), and there was no statistical difference between the two conditions with regard to follow-up attrition ($\chi^2(1)$ =0.378, $p$=0.579). However, further research with larger samples at follow-up will be essential in order to obtain accurate information about the long-range trajectory of these interventions.

The issue of comparability of the two participant groups also merits consideration. While the propensity score matching strategy constitutes a strength of the study, it also presents inherent limitations. While PSM succeeded in controlling for important potential confounds, such as severity of suicidal ideation at the beginning of treatment, some differences between the two groups (post-matching) were noted. In particular, the higher mean hopelessness score in the TAU group might potentially explain at least some of the lesser outcomes in the TAU group; on the other hand, trends toward greater treatment utilization (including a higher number of prior hospital admissions) in the CAMS group, might make the performance of CAMS even more noteworthy. Such ambiguities should be clarified as outcomes research moves more in the direction of larger, fully randomized studies that hopefully will eliminate such potential confounds.

Finally, even accepting a finding of CAMS superiority in this setting, our findings reveal little about reasons for this outcome. From a theoretical standpoint, it is reasonable to hypothesize that a focus on suicide as the central, priority problem in therapy, together with greater emphasis on a collaborative process around this focus, accounts for the differences. However, studies specifically designed to examine mechanisms of change will be necessary to draw any conclusions as to why CAMS patients improve faster during hospitalization (Rufino and Ellis, in press).

#### 4.1.1. Summary and significance of findings

The present findings advance the research literature on the treatment of suicidal individuals in several ways. First, as noted earlier, while the call for effective interventions specifically for suicidal individuals is intensifying (The Joint Commission, 2016), empirical evidence for the preventive impact of hospital treatment of suicidal patients is in short supply. Patients in the present study, regardless of treatment condition, showed marked improvement in outcomes over the course of hospitalization on both general and suicide-specific measures. Second, patients who received individual therapy from CAMS-trained therapists improved significantly faster, with significantly lower symptom scores on all measures at discharge. Finally treatment gains across the board proved quite robust, with no

noteworthy deterioration over a six-month follow-up period. Superiority of the CAMS condition was no longer apparent at 6-month follow-up, although this may be attributable at least in part to reduced statistical power due to attrition among follow-up participants. Post-hospitalization interventions such as telephone and/or on-line refresher sessions are worth considering as means of maintaining the advantages of CAMS over the critical period of time post-discharge.

Finally, these findings provide indirect support for the notion of "residual risk" (Rudd, 2006), which maintains that factors beyond depression and associated symptoms create vulnerability to later suicidal episodes. For example, studies have shown that, *independent of such contributors as depression severity, hopelessness, and prior attempts*, suicidality is associated with such transdiagnostic phenomena as sleep disturbance (Nadorff et al., 2014), experiential avoidance (Ellis and Rufino, 2016), implicit associations with death (Ellis et al., 2016), anhedonia (Winer et al., 2014), and suicide-related cognitions (Ellis and Rufino, 2015); moreover, lack of improvement in these areas is often associated with lesser reductions in suicidality. It is possible that the outcome differences apparent during the hospitalization phase of the current study are attributable to impact on such factors, and these differences comport with favorable outcomes of other suicide-specific approaches (Rudd et al., 2015; Wenzel et al., 2009). Further replication might suggest the importance of moving the standard of care beyond diagnosis-oriented therapies to interventions such as this that are specifically designed with such transdiagnostic factors in mind.

## Conflicts of interest

The authors have no conflicts of interest to report.

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## References

Andreasson, K., Krogh, J., Wenneberg, C., Jessen, H.K.L., Krakauer, K., Gluud, C., Thomsen, R.R., Randers, L., Nordentoft, M., 2016. Effectiveness of Dialectical Behavior Therapy versus Collaborative Assessment and Management of Suicidality treatment for reduction of self-harm in adults with borderline personality traits and disorder—a randomized observer-blinded clinical trial. Depress Anxiety 33, 520–530 . http://dx.doi.org/10.1002/da.22472.

Austin, P.C., 2011. An introduction to propensity score methods for reducing the effects of confounding in observational studies. Multivar. Behav. Res. 46, 399–424. http://dx.doi.org/10.1080/00273171.2011.568786.

Awata, S., Bech, P., Koizumi, Y., Seki, T., Kuriyama, S., Hozawa, A., Ohmori, K., Nakaya, N., Matsuoka, H., Tsuji, I., 2007. Validity and utility of the Japanese version of the WHO-Five Well-Being Index in the context of detecting suicidal ideation in elderly community residents. Int. Psychogeriatr. 19, 77–88. http://dx.doi.org/10.1017/S1041610206004212.

Bartak, A., Spreeuwenberg, M.D., Andrea, H., Busschbach, J.J., Croon, M.A., Verheul, R., Emmelkamp, P.M.G., Stijnen, T., 2009. The use of propensity score methods in psychotherapy research. A practical application. Psychother. Psychosom. 78, 26–34. http://dx.doi.org/10.1159/000162298.

Barth, R.P., Greeson, J.K.P., Guo, S., Green, R.L., Hurley, S., Sisson, J., 2007. Outcomes for youth receiving intensive in-home therapy or residential care: a comparison using propensity scores. Am. J. Orthopsychiatry 77, 497–505. http://dx.doi.org/10.1037/0002-9432.77.4.497.

Bateman, A., Fonagy, P., 2008. 8-Year follow-up of patients treated for borderline personality disorder: mentalization-based treatment versus treatment as usual. Am. J. Psychiatry 165, 631–638. http://dx.doi.org/10.1176/appi.ajp.2007.07040636.

Bateman, A., Fonagy, P., 2009. Randomized controlled trial of outpatient mentalization-based treatment versus structured clinical management for borderline personality disorder. Am. J. Psychiatry 166, 1355–1364. http://dx.doi.org/10.1176/appi.ajp.2009.09040539.

Bech, P., Olsen, L.R., Kjoller, M., Rasmussen, N.K., 2003. Measuring well-being rather than the absence of distress symptoms: a comparison of the SF-36 Mental Health subscale and the WHO-Five Well-being Scale. Int. J. Methods Psychiatr. Res. 12, 85–91. http://dx.doi.org/10.1002/mpr.145.

Beck, A.T., Steer, R.A., 1988. Manual for Beck Hopelessness Scale. Psychological Corporation, San Antonio.

Beck, A.T., Steer, R.A., 1991. Manual for Beck Scale for Suicide Ideation. Psychological Corporation, San Antonio.

Bond, F.W., Hayes, S.C., Baer, R.A., Carpenter, K.M., Guenole, N., Orcutt, H.K., Waltz, T., Zettle, R.D., 2011. Preliminary psychometric properties of the Acceptance and Action Questionnaire-II: a revised measure of psychological inflexibility and experiential avoidance. Behav. Ther. 42, 676–688. http://dx.doi.org/10.1016/j.beth.2011.03.007.

Brown, G.K., Jeglic, E., Henriques, G.R., Beck, A.T., 2006. Cognitive therapy, cognition, and suicidal behavior. In: Ellis, T.E. (Ed.), Cognition and Suicide: Theory, Research, and Therapy.. American Psychological Association, Washington, DC, 53–74.

Bryan, C.J., David Rudd, M., Wertenberger, E., Etienne, N., Ray-Sannerud, B.N., Morrow, C.E., Peterson, A.L., Young-McCaughon, S., 2014. Improving the detection and prediction of suicidal behavior among military personnel by measuring suicidal beliefs: an evaluation of the Suicide Cognitions Scale. J. Affect. Disord. 159, 15–22. http://dx.doi.org/10.1016/j.jad.2014.02.021.

Cameron, I.M., Crawford, J.R., Lawton, K., Sharma, S., Dutoit, S., Hay, S., Reid, I.C., 2008. Assessing the validity of the PHQ-9, HADS, BDI-II and OIDS-SR16 in measuring severity of depression in a UK sample of primary care patients with a diagnosis of depression: study protocol. Prim. Care Community Psychiatr. 13, 67–71.

Cohen, J., 1988. Statistical Power Analysis for the Behavioral Sciences. Erlbaum, Hillsdale, NJ.

Comtois, K.A., Jobes, D.A., O'Connor, S., Atkins, D.C., Janis, K., E. Chessen, C., Landes, S.J., Holen, A., Yuodelis-Flores, C., 2011. Collaborative assessment and management of suicidality (CAMS): feasibility trial for next-day appointment services. Depress. Anxiety 28, 963–972. http://dx.doi.org/10.1002/da.20895.

Ellis, T.E., 2006. Cognition and Suicide: Theory, Research, and Therapy. American Psychological Association, Washington, DC.

Ellis, T.E., Rufino, K.A., 2015. A psychometric study of the suicide cognitions scale with psychiatric inpatients. Psychol. Assess. 27, 82–89. http://dx.doi.org/10.1037/pas0000028.

Ellis, T.E., Rufino, K.A., 2016. Change in experiential avoidance is associated with reduced suicidal ideation over the course of psychiatric hospitalization. Arch. Suicide Res. 0, 0–12. http://dx.doi.org/10.1080/13811118.2015.1093983.

Ellis, T.E., Allen, J.G., Woodson, H., Frueh, B.C., Jobes, D.A., 2009. Implementing an evidence-based approach to working with suicidal inpatients. Bull. Menn. Clin. 73, 339–354. http://dx.doi.org/10.1521/bumc.2009.73.4.339.

Ellis, T.E., Daza, P., Allen, J.G., 2012a. Collaborative assessment and management of suicidality at Menninger (CAMS-M): an inpatient adaptation and implementation. Bull. Menn. Clin. 76, 147–171. http://dx.doi.org/10.1521/bumc.2012.76.2.147.

Ellis, T.E., Green, K.L., Allen, J.G., Jobes, D.A., Nadorff, M.R., 2012b. Collaborative assessment and management of suicidality in an inpatient setting: results of a pilot study. Psychotherapy 49, 72–80. http://dx.doi.org/10.1037/a0026746.

Ellis, T.E., Rufino, K.A., Allen, J.G., Fowler, J.C., Jobes, D.A., 2015. Impact of a suicide-specific intervention within inpatient psychiatric care: the collaborative assessment and management of suicidality. Suicide Life-Threat. Behav. 45, 556–566. http://dx.doi.org/10.1111/sltb.12151.

Ellis, T.E., Rufino, K.A., Green, K.L., 2016. Implicit measure of life/death orientation predicts response of suicidal ideation to treatment in psychiatric inpatients. Arch. Suicide Res. 20, 59–68. http://dx.doi.org/10.1080/13811118.2015.1004483.

Fowler, J.C., Madan, A., Allen, J.G., Ellis, T.E., Mahoney, J., Hardesty, S., Frueh, B.C., Oldham, J.M., 2015. Improvement in health-related quality of life among adults with serious mental illness receiving inpatient treatment. J. Clin. Psychiatry 77030, e632–e638. http://dx.doi.org/10.4088/JCP.14m09041.

Gearing, R.E., Schwalbe, C.S.J., Lee, R., Hoagwood, K.E., 2013. The effectiveness of booster sessions in CBT treatment for child and adolescent mood and anxiety disorders. Depress. Anxiety 30, 800–808. http://dx.doi.org/10.1002/da.22118.

Ghahramanlou-Holloway, M., Cox, D.W., Greene, F.N., 2012. Post-Admission Cognitive Therapy: a brief intervention for psychiatric inpatients admitted after a suicide attempt. Cogn. Behav. Pract. 19, 233–244. http://dx.doi.org/10.1016/j.cbpra.2010.11.006.

Ghahramanlou-Holloway, M., Neely, L.L., Tucker, J., 2015. Treating risk for self-directed violence in inpatient settings. In: Cognitive Behavioral Therapy for Preventing Suicide Attempts. Routledge, New York, 91–109.

Hansen, R.A., Dusetzina, S.B., Ellis, A.R., Sturmer, T., Farley, J.F., Gaynes, B.N., 2012. Risk of adverse events in treatment-resistant depression: propensity-score-matched comparison of antidepressant augment and switch strategies. Gen. Hosp. Psychiatry 34, 192–200. http://dx.doi.org/10.1016/j.genhosppsych.2011.10.001.

Institute of Medicine, 2002. Reducing Suicide: A National Imperative. National Academy Press, Washington, DC.

Jacobs, D.G., Baldessarini, R.J., Conwell, Y., Fawcett, J.A., Horton, L., Meltzer, H., Pfeffer, C.R., Simon, R.I., 2010. Practice Guideline for the Assessment and Treatment of Patients with Suicidal Behaviors. American Psychiatric Association, Washington, DC.

Jobes, D.A., 2012. The collaborative assessment and management of suicidality (CAMS): an evolving evidence-based clinical approach to suicidal risk. Suicide Life-Threat. Behav. 42, 640–653. http://dx.doi.org/10.1111/j.1943-278X.2012.00119.x.

Jobes, D.A., 2016. Managing Suicidal Risk: A Collaborative Approach 2nd ed.. Guilford, New York.

Jobes, D.A., Drozd, J.F., 2004. The CAMS approach to working with suicidal patients. J. Contemp. Psychother.. http://dx.doi.org/10.1023/B:JOCP.0000010914.98781.6a.

Jobes, D.A., Jennings, K.W., 2011. The Collaborative Assessment and Management of Suicidality (CAMS) with suicidal college students. Underst. Prev. Coll. Stud. Suicide, 236–254.

Jobes, D.A., Jacoby, A.M., Cimbolic, P., Hustead, L.A.T., 1997. Assessment and treatment of suicidal clients in a university counseling center. J. Couns. Pscyhology 44, 368–377. http://dx.doi.org/10.1037//0022-0167.44.4.368.

Jobes, D.A., Wong, S.A., Conrad, A.K., Drozd, J.F., Neal-Walden, T., 2005. The Collaborative assessment and management of suicidality versus treatment as usual: a retrospective study with suicidal outpatients. Suicide Life Threat. Behav. 35, 483–497.

Linehan, M.M., 1993. Cognitive Therapy for Borderline Personality Disorder. Guilford, New York.

Linehan, M.M., 2008. Suicide intervention research: a field in desperate need of development. Suicide Life Threat. Behav. 38, 483–485. http://dx.doi.org/10.1521/suli.2008.38.5.483.

Linehan, M.M., Comtois, K.A., Murray, A.M., Tutek, D.A., Reynolds, S.K., Lindenboim, N., 2006. Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. Arch. Gen. Psychiatry 63, 757–766.

Lowe, B., Grafe, K., Zipfel, S., Witte, S., Loerch, B., Herzog, W., 2004a. Diagnosing ICD-10 depressive episodes: Superior criterion validity of the Patient Health Questionnaire. Psychother. Psychosom. 73, 386–391. http://dx.doi.org/10.1159/000080393.

Lowe, B., Spitzer, R.L., Grafe, K., Kroenke, K., Quenter, A., Zipfel, S., Buchholz, C., Witte, S., Herzog, W., 2004b. Comparative validity of three screening questionnaires for DSM-IV depressive disorders and physicians' diagnoses. J. Affect. Disord. 78, 131–140. http://dx.doi.org/10.1016/S0165-0327(02)00237-9.

Luxton, D.D., June, J.D., Comtois, K.A., 2013. Can postdischarge follow-up contacts prevent suicide and suicidal behavior? A review of the evidence. Crisis 34, 32–41. http://dx.doi.org/10.1027/0227-5910/a000158.

Madan, A., Frueh, B.C., Allen, J.G., Ellis, T.E., Rufino, K.A., Oldham, J.M., Fowler, J.C., 2016. Psychometric reevaluation of the Columbia–Suicide Severity Rating Scale: Findings from a prospective, inpatient cohort of severely mentally ill adults. J. Clin. Psychiatry 77, e867–e873.

Marangell, L.B., Dennehy, E.B., Wisniewski, S.R., Bauer, M.S., Miyahara, S., Allen, M.H., Martinez, M., Al Jurdi, R.K., Thases, M.E., 2008. Case-control analyses of the impact of pharmacotherapy on prospectively observed suicide attempts and completed suicides in bipolar disorder: findings from STEP-BD. J. Clin. Psychiatry 69, 916–922.

Nadorff, M.R., Ellis, T.E., Allen, J.G., Winer, E.S., Herrera, S., 2014. Presence and persistence of sleep-related symptoms and suicidal ideation in psychiatric inpatients. Crisis 35, 398–405. http://dx.doi.org/10.1027/0227-5910/a000279.

Posner, K., Brown, G.K., Stanley, B., Brent, D.A., Melvin, G.A., Greenhill, L., Shen, S., 2011. The Columbia–suicide severity Rating scale: initial validity and internal consistency findings from t hree multisite studies with adolescents and adults. Am. J. Psychiatry 168, 1266–1278.

Poulsen, S., Lunn, S., Daniel, S., Folke, S., Mathiesen, B.B., Katznelson, H., Fairburn, C.G., 2014. A randomized controlled trial of Psychoanalytic psychotherapy or cognitive-behavioral therapy for bulimia nervosa. Am. J. Psychiatry 171, 109–116. http://dx.doi.org/10.1176/appi.ajp.2013.12121511.

Qin, P., Nordentoft, M., 2005. Suicide risk in relation to psychiatric hospitalization: evidence based on longitudinal registers. Arch. Gen. Psychiatry 62, 427–432. http://dx.doi.org/10.1001/archpsyc.62.4.427.

Rudd, M.D., 2006. Fluid vulnerability theory: a cognitive approach to understanding the process of acute and chronic suicide risk. In: Cognition and Suicide: Theory, Research, and Therapy. American Psychological Association, Washington, DC, 355–368.

Rudd, M.D., Bryan, C.J., Wertenberger, E.G., Peterson, A.L., Young-McCaughan, S., Mintz, J., Williams, S.R., Arne, K. a., Breitbach, J., Delano, K., Wilkinson, E., Bruce, T.O., 2015. Brief cognitive-behavioral therapy effects on post-treatment suicide attempts in a military sample: results of a randomized clinical trial with 2-year follow-up. Am. J. Psychiatry 172, 441–449. http://dx.doi.org/10.1176/appi.ajp.2014.14070843.

Rufino, K.A., Ellis, T.E.(in press). Contributions of cognitions, psychological flexibility, and therapeutic alliance to suicidal ideation in psychiatric inpatients. Suicide Life-Threat. Behav.

Simon, G.E., Rutter, C.M., Peterson, D., Oliver, M., Whiteside, U., Operskalski, B., Ludman, E.J., 2013. Does response on the PHQ-9 Depression Questionnaire predict subsequent suicide attempt or suicide death? Psychiatr. Serv. 64, 1195–1202. http://dx.doi.org/10.1176/appi.ps.201200587.

Spitzer, R.L., Kroenke, K., Williams, J.B., 1999. Validation and utility of a self-report version of PRIME-MD: the PHQ primary care study. JAMA J. Am. Med. Assoc. 282, 1737–1744. http://dx.doi.org/10.1001/jama.282.18.1737.

Stürmer, T., Joshi, M., Glynn, R.J., Avorn, J., Rothman, K.J., Schneeweiss, S., 2006. A review of the application of propensity score methods yielded increasing use, advantages in specific settings, but not substantially different estimates compared with conventional multivariable methods. J. Clin. Epidemiol., 59. http://dx.doi.org/10.1016/j.jclinepi.2005.07.004.

The Joint Commission, 2016. Detecting and Treating Suicide Ideation in All Settings.

Topp, C.W., Ostergaard, S.D., Sondergaard, S., Bech, P., 2015. The WHO-5 well-being index: a systematic review of the literature. Psychother. Psychosom. 84, 167–176. http://dx.doi.org/10.1159/000376585.

Tucker, R.P., Crowley, K.J., Davidson, C.L., Gutierrez, P.M., 2015. Risk factors, warning signs, and drivers of suicide: what are they, how do they differ, and why does it matter? Suicide Life-Threat. Behav., 1–11. http://dx.doi.org/10.1111/sltb.12161.

Ustun, T.B., Chatterji, S., Kostanjsek, N., Rehm, J., Kennedy, C., Epping-Jordan, J., Saxena, S., von Korff, M., Pull, C., 2010. Developing the world health organization disability assessment schedule 2.0. Bull. World Health Organ. 88, 815–823. http://dx.doi.org/10.2471/BLT.09.067231.

Wenzel, A., Brown, G.K., Beck, A.T., 2009. Cognitive Therapy for Suicidal Patients: Scientific and Clinical Applications. Guilford, New York.

Winer, E.S., Nadorff, M.R., Ellis, T.E., Allen, J.G., Herrera, S., Salem, T., 2014. Anhedonia predicts suicidal ideation in a large psychiatric inpatient sample. Psychiatry Res. 218, 124–128. http://dx.doi.org/10.1016/j.psychres.2014.04.016.

Ye, Y., Kaskutas, L.A., 2009. Using propensity scores to adjust for selection bias when assessing the effectiveness of Alcoholics Anonymous in observational studies. Drug Alcohol Depend. 104, 56–64. http://dx.doi.org/10.1016/j.drugalcdep.2009.03.018.

Young, M.A., Fogg, L.F., Scheftner, W., Fawcett, J., Akiskal, H., Maser, J., 1996. Stable trait components of hopelessness: baseline and sensitivity to depression. J. Abnorm. Psychol. 105, 155–165. http://dx.doi.org/10.1037/0021-843X.105.2.155.