Supplemental Data

Appendix. Search Strategies

Initial searches January 1, 2008 to March 3, 2015; updated September 11, 2015

Databases Searched: MEDLINE via PubMed, PsycINFO via OVID, Cochrane Central Register of Controlled Trials (CCRCT) via OVID, SocINDEX via EBSCOHost

MEDLINE via PubMed

Concept	**Search Terms**
Suicide	(("Suicide"[Mesh]) OR "Suicidal Ideation"[Mesh]) OR "Suicide, Attempted"[Mesh]
	OR (suicide[Title/Abstract] OR suicidal[Title/Abstract] OR suicidality[Title/Abstract] OR parasuicide[Title/Abstract] OR self-harm[Title/Abstract] OR "self-directed violence"[Title/Abstract] OR parasuicidal[Title/Abstract]) NOT "non-suicidal self injury"[Title/Abstract]
Prevention	"prevention and control" [Subheading] OR "Tertiary Prevention"[Mesh] OR "Secondary Prevention"[Mesh] OR "Primary Prevention"[Mesh]
	OR (prevent*[Title/Abstract] OR control[Title/Abstract])
Risk Prediction	(((((("Risk"[Mesh]) OR "Risk Reduction Behavior"[Mesh]) OR "Risk Assessment"[Mesh]) OR "Risk Factors"[Mesh]) OR "Mass Screening"[Mesh]) OR "Validation Studies" [Publication Type]
	OR (risk[Title] OR screening[Title] OR screen[Title] OR assessment[Title] OR assessments[Title] OR questionnaire[Title] OR questionnaires[Title] OR instrument[Title] OR instruments[Title] OR tool[Title] OR tools[Title] OR scale[Title] OR scales[Title] OR measure[Title] OR measures[Title] OR correlate*[Title] OR “risk-stratification”[Title] OR predict[Title] OR predicts[Title] OR predictor[Title] OR predictors[Title]) OR (((((((ReACT Self Harm Rule[Title/Abstract]) OR Suicidal Ideation Attributes Scale[Title/Abstract]) OR Suicide Trigger Scale[Title/Abstract]) OR Cultural Assessment of Risk for suicide[Title/Abstract]) OR Affective Intensity Rating Scale[Title/Abstract]) OR Columbia Suicide Severity Rating Scale[Title/Abstract]) OR Edinburgh Risk of Repetition Scale[Title/Abstract]) OR Manchester Self Harm tool[Title/Abstract]
Limits: Humans Adults English only Last 5 years	NOT ((("Letter" [Publication Type]) OR "Editorial" [Publication Type]) OR "Comment" [Publication Type]) Filters: published from January 2008 to Present; Humans; English; Adult: 19+ years (3411) After de-duplication, N=2913

Not letters, editorials	

PsychINFO via OVID

1 suicide/ or attempted suicide/ or suicidal ideation/ (29009)

2 (suicide or suicidal or suicidality or parasuicide or self-harm or "self-directed violence" or parasuicidal).mp. (49986)

3 1 or 2 (49986)

4 exp Suicide Prevention/ or prevention.mp. or exp Suicide Prevention Centers/ (98208)

5 exp Risk Assessment/ or risk.mp. or exp Risk Factors/ (249298)

6 (risk or screening or screen or assessment or assessments or questionnaire or questionnaires or instrument or instruments or tool or tools or scale or scales or measure or measures or correlate* or "risk stratification" or predict or predicts or predictor or predictors).mp. (1380001)

7 ReACT Self Harm Rule.mp. (3)

8 Suicidal Ideation Attributes Scale.mp. (2)

9 Suicide Trigger Scale.mp. (4)

10 Cultural Assessment of Risk for suicide.mp. (5)

11 Affective Intensity Rating Scale.mp. (2)

12 Columbia Suicide Severity Rating Scale.mp. (183)

13 Edinburgh Risk of Repetition Scale.mp. (2)

14 Manchester Self Harm tool.mp. (0)

15 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 (1380001)

16 4 or 15 (1420668)

17 3 and 16 (30393)

18 limit 17 to (peer reviewed journal and human and english language and treatment & prevention and adulthood <18+ years> and from January 2008 to Present) (1445)

After deduplication, N= 946

Cochrane Central Register of Controlled Trials (CCRCT) via OVID

1 suicide/ or attempted suicide/ or suicidal ideation/ (488)

2 (suicide or suicidal or suicidality or parasuicide or self-harm or "self-directed violence" or parasuicidal).mp. (1720)

3 1 or 2 (1720)

4 exp Suicide Prevention/ or prevention.mp. or exp Suicide Prevention Centers/ (41007)

5 exp Risk Assessment/ or risk.mp. or exp Risk Factors/ (83788)

6 (risk or screening or screen or assessment or assessments or questionnaire or questionnaires or instrument or instruments or tool or tools or scale or scales or measure or measures or correlate* or "risk stratification" or predict or predicts or predictor or predictors).mp. (272313)

7 ReACT Self Harm Rule.mp. (0)

8 Suicidal Ideation Attributes Scale.mp. (0)

9 Suicide Trigger Scale.mp. (0)

10 Cultural Assessment of Risk for suicide.mp. (0)

11 Affective Intensity Rating Scale.mp. (0)

12 Columbia Suicide Severity Rating Scale.mp. (11)

13 Edinburgh Risk of Repetition Scale.mp. (0)

14 Manchester Self Harm tool.mp. (0)

15 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 (272313)

16 4 or 15 (293030)

17 3 and 16 (1319)

18 limit 17 to (peer reviewed journal and human and english language and treatment & prevention and adulthood <18+ years> and from January 2008 to Present) [Limit not valid; records were retained] (583)

After deduplication, N=342

SocINDEX via EBSCOHost

S1 TI suicide OR suicidal OR suicidality OR parasuicide OR self-harm OR "self directed violence" OR parasuicidal

S2 DE "HEALTH risk assessment" OR DE "SUICIDAL behavior -- Risk factors"

S3 DE "SUICIDE" OR DE "SUICIDAL behavior”

S4 DE "SUICIDE prevention" OR DE "PREVENTIVE medicine"

S5 TI prevent* OR control OR risk OR screen OR screen OR assessment OR assessments OR questionnaire OR questionnaires OR instrument OR instruments OR tool OR tools OR scale OR scales OR measure OR measures OR correlate* OR "risk-stratification" OR predict OR predicts OR predictor OR predictors

S6 S1 OR S3

S7 S2 OR S4 OR S5

S8 S6 AND S7

S9 S6 AND S7 Limiters - Date of Publication: 20100101-20151231 (318)

After deduplication, N=223

Appendix Table 1. Inclusion/Exclusion Criteria

Category	Include	Exclude
Population	Veterans; military personnel; non-Veteran/military individuals age ≥18 who are demographically similar from US, UK, Canada, New Zealand, or Australia.	Individuals dissimilar to the included population; patients with other serious psychiatric or medical co-morbidities (*eg*, cancer). Exclusions based on population characteristics apply to the majority of enrolled participants, studies are not excluded if only a small number of participants with these characteristics are enrolled or if results are specifically provided by population subgroups.
Intervention	Population-directed healthcare services (*eg*, hotlines, outreach programs); individual-directed healthcare services (*eg*, case management, follow-up); services that are clinically relevant to medical practice in the US.	Interventions other than those specifically described in the inclusion criteria, including: interventions that primarily treat co-existing conditions, including pharmacotherapy.
Comparator	Intervention versus non-intervention, usual care, or other intervention.	Comparison groups using interventions other than those specifically described in the inclusion criteria.
Outcomes	Suicidal self-directed violence including suicide attempt and suicide; suicide-specific mortality. Additional secondary outcomes will be collected as available from studies designed primarily to capture suicidal self-directed violence. For KQ2, studies need to report a measure of diagnostic accuracy.	Self-directed violence ideation and undetermined or non-suicidal self-directed violence; other outcomes not listed as included.
Timing	All included.	No limitations.
Setting	For risk assessment and intervention studies: Veteran or military inpatient or outpatient setting; or comparable non-Veteran/military setting.	Settings not applicable to US Veteran or military populations.
Study Design	**KQ1:** Studies reporting diagnostic accuracy for methods to identify at-risk individuals using best evidence approach. Methods include risk assessment instruments and checklists	Case reports.

Category	Include	Exclude
	of clinical symptoms and warning signs, for example; comparisons between various settings and modes of delivery, targeting specific populations, and other approaches. **KQ2:** *Effectiveness:* randomized controlled trials (RCTs); observational studies with comparison groups, systematic reviews with these study designs. *Adverse effects:* RCTs, observational studies, systematic reviews, meta-analyses, and modeling studies; others considered. **KQ3:** New studies of risk assessment and interventions specific to Veterans/military personnel.	
Language	English-language abstracts (includes English-language abstracts of non-English language papers) and papers.	Non English-language papers.
Data Sources	Ovid MEDLINE, PubMed, PsycINFO, SocINDEX, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, grey literature sources.	Sources not listed as included.
Search Dates	Varies by key question; for questions addressed by prior systematic reviews, searches will include dates since the prior searches.	Studies published outside of the specified search dates.

Appendix Table 2. Studies of the Accuracy of Methods to Identify Individuals at Risk for Suicide and Attempts

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
Bernert, et al., 2014[26]	Hierarchical logistic multiple regression analysis controlled for baseline depression; determined AUC estimates.	420 older adults selected from a larger U.S. cohort of 14,456 community dwelling older adults; 20 suicide decedents and 400 controls matched on age, sex, and study site.	Sleep Quality Index, a 5-item self-report measure.	Suicide within 10-year observation period as listed on official death certificates (ICD-9 code 950 to 959).	AUC .685 (95% CI=.549-.820). Sleep Quality Index total scores distinguished suicide decedents from matched controls (*P*=.005).	Unclear
Bolton, et al., 2012[27]	Logistic regression analysis; used AUC estimates to determine optimum cut-points to estimate sensitivity, specificity, PPV, NPV.	4,019 adults referred to psychiatric services at emergency departments of 2 large hospitals in Canada.	SAD PERSONS and Modified SAD PERSONS, 10-item checklists.	Current suicide attempts and suicide attempts within 6 months as defined by the Columbia Classification Algorithm of Suicide Assessment.	• SAD PERSONS: Current suicide attempt, score >3: 73% sensitivity, 44% specificity; PPV 33.0%, NPV 83%. AUC .657 (95% CI=.63-.69), *P*<.001. Future suicide attempt, score >2: 88.8% sensitivity, 20% specificity; PPV 3%, NPV 98%. AUC .572 (95% CI=.51-.64). • Modified SAD PERSONS: Current suicide attempt, score of >3: 81% sensitivity, 36% specificity; PPV 31%, NPV 84%. AUC .738 (95% CI=.71-.77), *P*< .001. Future suicide attempt, cut score of >3: 82% sensitivity, 28% specificity; PPV 3%, NPV	Unclear

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
					98%. AUC .613 (95% CI=.55-.68), *P*<.01. • 9-item risk model (sex, age 19 to 45, depression or hopelessness, previous attempts or psychiatric care, drug or alcohol abuse, rational thinking loss, organized plan or serious attempt, sickness, stated future intent): Current suicide attempt, score >4: 90.4% sensitivity, 66% specificity; PPV 49%, NPV 95%. AUC .874 (95% CI=.85-.89), *P*<.001. • 5-item risk model (previous attempts or psychiatric care, alcohol or drug abuse, stated future intent, age 19-45 years, rational thinking loss): Future suicide attempt, score >1: 94% sensitivity, 28% specificity; PPV 4%, NPV 99%. AUC .665 (95% CI=.61-.72), *P*<.001.	
Breshears, et al., 2010[22]	Hierarchical multiple regression and AUC estimates to determine optimum cut-points to estimate sensitivity and specificity.	154 veterans with traumatic brain injury in the U.S.	Suicide Potential Index and Suicidal Ideation subscales of the Personality Assessment Inventory.	Suicide and suicidal behavior (not defined) within 2 years of assessment.	Suicide Potential Index: • Cut-point ≥15: 91% sensitivity, 77% specificity; AUC .903. • Cut-point ≥15 plus pre-assessment suicidal behavior: 91% sensitivity, 95% specificity; AUC .972. • Cut-point ≥11 plus pre-assessment suicidal behavior: 100.0% sensitivity, 86% specificity.	High

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
					The Suicidal Ideation subscale scores did not increase incremental validity (*P*=.65, diagnostic accuracy not determined).	
Galfalvy, et al., 2008[28]	Cox proportional hazard regression models and stepwise model selection procedures to determine predictor variables and AUC estimates to determine optimum cut-points to estimate sensitivity and specificity.	304 adults with major depressive disorder or bipolar disorders presenting for evaluation and treatment in the U.S.	15 candidate predictor variables for models include age, gender, psychiatric diagnosis, co-morbid borderline personality disorder, history of past suicide attempt, smoking, and baseline scores on 9 psychosocial scales.[a]	Suicide attempts within 2 years based on an in-depth assessment of suicidal behavior.	• Model 2 (3 terms: past suicide attempt, smoking status, and suicidal ideation score): AUC .76. Cut-point .5: 27%, sensitivity, 92% specificity. Cut-point .25: 75% sensitivity, 75% specificity. • Model 4 (40 terms): AUC .90. Cut-point .5: 63% sensitivity, 91% specificity. Cut-point .25: 71% sensitivity, 80% specificity. • Model 5 (9 terms: past suicide attempt, smoking status, age, past attempt X age, male sex, suicidal ideation score, hostility score, bipolar diagnosis, bipolar diagnosis X hostility score): AUC .81. Cut-point .5: 31% sensitivity, 92% specificity. Cut-point .25: 71% sensitivity, 77% specificity.	Unclear

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
Galynker, et al., 2015[29]	Exploratory factor analysis of questionnaire items associated with suicidality; a simplified 9-item score was calculated as the sum of scores for items loading above .5 on factor one minus the sum of scores for items loading above .5 on factor two.	91 adult psychiatric inpatients admitted for suicidal ideation or suicide attempt.	Suicide Opinion Questionnaire (SOQ), a 100-item self-report measure.	Suicide attempts within 2 months of discharge based on the Columbia Suicide Severity Rating Scale (C-SSRS).	• 20-item model (items found to be statistically significant between suicide attempters and non-attempters): AUC .944. Optimal cut-point (not reported): 86% sensitivity, 97% specificity. Correctly classified 35/40 (88%) of participants. • 9-item model: AUC .861. Cut-point <10: 86% sensitivity, 70% specificity Lower Beck Scale for Suicide Ideation scores showed a non-significant trend to increased risk of post-discharge suicide attempt (AUC .650, *P*=.292). C-SSRS rating of suicidal ideation severity showed no relation with post-discharge suicide attempt (AUC .521, *P*=.856).	High
Hartl, et al., 2005[23]	Signal detection methods and AUC estimates to determine optimum cut-points to estimate sensitivity and specificity.	630 male veterans with a primary posttraumatic stress disorder (PTSD) diagnosis entering a residential treatment program for PTSD in the U.S.	Beck Depression Inventory.	Suicide attempt within 4 months of discharge.	Beck Depression Inventory ≥46 and suicide attempt in the 4 months prior to intake: 63% sensitivity, 80% specificity in the exploratory sample; 11% sensitivity, 84% specificity in the replication sample.	High

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
Hendin, et al., 2010[24]	AUC estimates to determine sensitivity and specificity.	283 in- and outpatients at a VA Medical Center in the U.S. with affective disorder, or affective disorder plus substance abuse or anxiety disorders.	Affective States Questionnaire; a positive score was determined by rating at least 3 of the 7 affects as "severe" or "extreme."	Suicidal behavior[b] within 3 months of assessment.	60% sensitivity, 74% specificity; PPV 32%, NPV 90%.	Unclear
Kessler, et al., 2015[30]	Use of administrative data from the Historical Administrative Data System of the Army STARRS and machine learning methods (regression trees and penalized regressions) to develop a risk algorithm to predict post-hospitalization suicides.	40,820 active duty U.S. Army soldiers with 53,769 psychiatric hospitalizations.	Population-level prediction model derived from 38 U.S. Army and Department of Defense administrative data systems (421 individual predictor variables).	Suicides within 12 months of hospital discharge.	• 20-predictor model: AUC .84 • 73-predictor model: AUC .89 • 421-predictor model: AUC .85	Low
McCarthy, et al., 2015[31]	Predictive model derived from clinical records; included patients	5,969,662 veterans alive as of September 2010 and had	Population-level prediction model derived	Suicide within 12 months according to	AUC .761 (95% CI=.751-.771).	Low

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
	who died from suicide (case patients) and a random 1% of living patients (control patients), divided randomly into development and validation sets; determined AUC estimates.	encounters with the Veterans Health Administration in the U.S. in the previous 2 years.	from Veterans Health Administration clinical records (381 total measures including 31 interaction terms).	the National Death Index.		
Nock, et al., 2010[32]	Hierarchical logistic regression analysis with a step controlling for clinician/patient prediction and severity of suicide ideation at presentation; determined sensitivity, specificity, PPV, NPV estimates.	157 adults presenting to a psychiatric emergency department in the U.S. with lifetime histories of suicide attempts at baseline; 91 patients were included in the diagnostic accuracy analysis.	Scores on the Death/suicide Implicit Association Test were dichotomized depending on whether a score represented an association between death/suicide and self (score >0) versus life and self (score <0).	Suicide attempts within 6 months assessed by the Self-Injurious Thoughts and Behaviors Interview.	Cut-point >0: 50% sensitivity, 81% specificity; PPV 32%, NPV 90%.	Unclear
Rana, et	15 machine learning	27,061 risk	15 separate	Suicide	Sensitivity 35-50%; specificity 65-70%.	Unclear

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
al., 2012[33]	algorithms to determine accuracy in discriminating between patients who die by suicide, attempt suicide, and never attempt suicide; 100 random subsets of data were created, classification was performed and averaged, and sensitivity and specificity were calculated.	assessments from 8,739 patients receiving care at the Mental Health, Drugs and Alcohol Services at a large public health system.	machine learning algorithms to examine associations between suicide and the Barwon Health Suicide Risk Assessment, an 18-item clinician-rated checklist.	(death certificates and a centralized registry) or suicide attempts (emergency department ICD codes for self-harm).		
Steeg, et al., 2012[34]	A clinical screening tool was derived using a classification tree that used binary recursive partitioning to split the data, then was tested with data from patients at another site; determined sensitivity, specificity, PPV,	29,571 episodes of self-harm by 18,680 adults aged ≥16 years presenting to emergency departments in England (22,532 episodes derivation set, 7,039 validation set).	ReACT Self Harm Rule, a clinical screening tool using 4 domains. Presentation with self-harm was classified as either low risk or high to moderate risk based on the presence of	Suicide within 6 months according to the ICD-10 codes from patients' records in national health database.	• Derivation set: 91% (95% CI=81-97%) sensitivity, 15% (95% CI=15-16%) specificity; PPV 40% (95% CI=30-50%), NPV 99.8% (95% CI=99.6-99.9%). • Validation set: 88% (95% CI=70-98%) sensitivity, 24% (95% CI=23-25%) specificity; PPV 50% (95% CI=30-70%), NPV 99.6% (95% CI=99.5-99.7%). • Correctly predicted 83/92 (90.2%) of suicides occurring within 6 months.	Low

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
	NPV estimates.		one or more risk factors.			
Tiet, et al., 2006[25]	A decision tree for identifying high-risk patients was derived from the Addiction Severity Index and variables from VA databases; used AUC estimates to determine optimum cut-points to estimate sensitivity and specificity for 3 models.[c]	5,671 adults with suicidal ideation from a national cohort seeking substance abuse treatment at 150 VA Medical Centers in the U.S.	Decision tree included significant predictors of suicide attempts.[d]	Suicide attempts in the past 30 days assessed with the Addiction Severity Index face-to-face interview.	• 30% model: 33% sensitivity, 87% specificity; PPV 37%, NPV 85%. • 20% model: 72% sensitivity, 63% specificity; PPV 30%, NPV 90%. • 10% model: 89% sensitivity, 42% specificity; PPV 25%, NPV 95%.	Unclear
Tran, et al., 2014[35]	A predictive model for 1-6 month risk of suicide was derived from data from electronic medical records; the model was compared to an established clinician-rated checklist to estimate AUC.	7,399 patients undergoing suicide risk assessment (4,911 derivation set, 2488 validation set).	Risk stratification model using data from electronic medical records was compared to the Barwon Health Suicide Risk Assessment, an 18-item clinician-rated	Suicide or suicide attempts (ICD-10 self-harm codes of high- or moderate-lethality) within 180 days of risk assessment.	AUC for high-risk; clinician checklist versus electronic medical record model: • 30 days: .55 (95% CI=.44-.67) versus .73 (95% CI=.62-.84). • 60 days: .59 (95% CI=.50-.69) versus .79 (95% CI=.70-.85). • 90 days: .58 (95% CI=.50-.66) versus .79 (95% CI=.72-.84). • 180 days: .57 (95% CI=.49-.63) versus .75 (95% CI=.69-.80).	Unclear

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
			checklist.			
van Spijker, et al., 2014[36]	Online responses on the Suicidal Ideation Attributes Scale were compared with a set of psychosocial assessments[e] to estimate AUC, sensitivity, and specificity.	1,352 adults from the general population in Australia who were recruited online.	Suicidal Ideation Attributes Scale, a 5-item online self-report measure.	Suicide preparation/ attempt in the past year based on a condensed version of the Columbia Suicide Severity Rating Scale.	• Cut-point ≥1 (low ideation): 84.0% sensitivity, 64% specificity. • Cut-point ≥21 (high ideation): 50% sensitivity, 95% specificity.	Unclear
Yaseen, et al., 2012a[38]	Correlations between suicide attempts and the Suicide Trigger Scale were calculated using binary logistic regression analysis; used AUC estimates to determine optimum cut-points to estimate sensitivity and specificity.	183 adult psychiatric patients with suicidal ideation or attempts in a psychiatric emergency department in the U.S.	Suicide Trigger Scale, a 42-item self-report measure.	Current suicide attempt and attempts within the next year based on the Columbia Suicide Severity Rating Scale.	• Current attempt: AUC .724, *P*=.002. Cut-point 13: 72% sensitivity, 61% specificity. • Future attempt: Not calculated because of high loss to follow-up.	High
Yaseen, et al., 2012b[37]	Derived a composite suicide-related subscale from items	176 adult psychiatric patients with	Modification of the Affective	Current suicide attempt	• Cut-point ≥0 overall: AUC .768 (95% CI=.673-.864), *P*<.0005; 87% sensitivity, 42% specificity.	High

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
	from the Affective Intensity Rating Scale; determined sensitivity and specificity.	suicidal ideation or attempts in a psychiatric emergency department in the U.S.	Intensity Rating Scale, a 17-item self-report measure.	based on the Columbia Suicide Severity Rating Scale.	• Cut-point ≥0 for substantive attempts: AUC .744, *P*=.010; 90% sensitivity, 38% specificity.	
Yaseen, et al., 2014[39]	Transformed scores from the Suicide Trigger Scale were calculated as the absolute value of the total score minus the median score; used AUC estimates to determine optimum cut-points to estimate sensitivity, specificity, PPV, NPV.	161 adult psychiatric patients hospitalized following suicidal ideation or attempt in the U.S.	Suicide Trigger Scale, a 42-item self-report measure.	Suicide attempt within 6 months of discharge based on the Columbia Suicide Severity Rating Scale, U.S. national death registry, and patient medical records.	• Full scale: Cut-point ≥19: 69% sensitivity, 68% specificity; PPV 41%, NPV 88%; AUC .731, *P*=.013. Correctly classified 37/54 (69%) participants. • 6-item subscale (items 2, 4, 7, 23, 27 and 41, median score 7): AUC .814, *P*=.001. Cut-point >2: 92% sensitivity, 63% specificity. Cut-point >3: 69% sensitivity, 78% specificity.	High
Yen, et al., 2011[40]	Used Cox proportional hazards regression analyses to determine whether baseline scores predicted suicide attempts at	733 adults with a personality disorder or major depressive disorder.	Schedule for Nonadaptive and Adaptive Personality–Self-harm Subscale (SNAP-SH), a	Suicide or suicide attempt within 12 months based on self-reported	AUC .855 • Cut-point 10: 84% sensitivity, 70% specificity; PPV 22%. • Cut-point 11: 78% sensitivity, 77% specificity; PPV 26%. • Cut-point 12: 72% sensitivity, 85% specificity; PPV 33%.	Unclear

Author, Year	Approach	N; Population	Risk assessment method	Outcome	Measures of Accuracy	Risk of bias rating
	follow-up; determined AUC estimates and calculated sensitivity, specificity, and PPV.		16-item subscale of a self-report personality inventory.	behaviors on a semi-structured interview.		

Abbreviations: Army STARRS, Army Study to Assess Risk and Resilience in Servicemembers; AUC, area under the receiver-operator characteristic (ROC) curve; CI, confidence interval; NPV, negative predictive value; PPV, positive predictive value; PTSD, posttraumatic stress disorder; ROC, receiver-operator characteristic (ROC) curve; VA, Veterans Affairs.

[a] Hamilton Depression Rating Scale, Beck Depression Inventory, Beck Hopelessness Scale, Scale for Suicidal Ideation, Reasons for Living Inventory, Brown Goodwin Lifetime Aggression History Scale, Buss-Durkee Hostility Inventory, Barratt Impulsivity Scale, and St. Paul Ramsey Questionnaire.

[b] Attempts, interrupted or aborted attempts, or preparatory acts/behaviors, with some degree of intent to die; or hospitalization/institutionalization.

[c] Based on the results of the decision tree, sensitivity and specificity were calculated for 3 hypothetical models using varying cut points of the percentages (10%, 20%, and 30%) of patients who attempted suicide in the past 30 days. A model that uses a cut-point at 30% means that the model requires the true-positive rate to be at least a 30% and that 30% or more of patients are predicted to attempt suicide.

[d] Suicide attempt/ideation history, recent alcohol abuse, recent cocaine abuse, violent behavior, hallucinations, and employment status.

[e] Psychological distress, depression, anxiety disorders, alcohol use, sleep problems, suicidal ideation, suicide literacy, suicide stigma, exposure to suicide, interpersonal risk factors for suicide, and demographic variables.

Appendix Table 3. Studies Included in Figure 1

Study	% Sensitivity	Specificity
Bolton, 2012[33]		
SAD PERSONS	88.8	19.6
Modified	81.6	28.3
9-items	90.4	65.6
5-items	93.5	27.9
Breshears, 2010[28]		
Suicide Potential Index	100	86
Galfalvy, 2008[34]		
3-term model	75	75
Galynker, 2015[35]		
Suicide Opinion Questionnaire	85.7	97
Hartl, 2005[29]		
Beck Depression Inventory[a]	11	84
Hendin, 2010[30]		
Affective States Questionnaire	60	74
Nock, 2010[38]		
Implicit Association Test	50	81
Steeg, 2012[40]		
ReACT Self Harm Rule[a]	88	24
Tiet, 2006[31]		
VA decision tree	89	42
Van Spijker, 2014[42]		
Suicide Ideation Attributes Scale	84	63.6
Yaseen, 2012[44]		
Suicide Trigger Scale	72.2	60.5
Yaseen, 2014[45]		
Suicide Trigger Scale[b]	92.3	63.4
Yaseen, 2012[43]		
Affective Intensity Rating Scale	90.0	38.4
Yen, 2011[46]		
SNAP-SH	84	70

[a] Results for validation set.
[b] 6-item subscale.

Appendix Table 4. Studies Included in Figure 2

Study	AUC (95% CI)
Bernert, 2014[32]	
Sleep Quality Index	0.685 (0.549 to 0.820)
Bolton, 2012[33]	
SAD PERSONS	0.572 (0.51 to 0.64)
Modified	0.613 (0.55 to 0.68)
9-items	0.874 (0.85 to 0.89)
5-items	0.665 (0.61 to 0.72)
Breshears, 2010[28]	
Suicide Potential Index	0.972
Galfalvy, 2008[34]	
40-term model	0.90
Galynker, 2015[35]	
Suicide Opinion Questionnaire[a]	0.944
Kessler, 2015[36]	
Army STARRS model	0.89
McCarthy, 2015[37]	
VA model	0.761 (0.751 to 0.771)
Tran, 2014[41]	
Barwon Assessment	0.59 (0.50 to 0.69)
Electronic Medical Record model	0.79 (0.70 to 0.85)
Yaseen, 2012[44]	
Suicide Trigger Scale	0.724
Yaseen, 2014[45]	
Suicide Trigger Scale[b]	0.814
Yaseen, 2012[43]	
Affective Intensity Rating Scale	0.744
Yen, 2011[46]	
SNAP-SH	0.855

[a] 20-item model.
[b] 6-item subscale

Appendix Table 5. Strength of Evidence Ratings for Studies of Healthcare Service Interventions for Suicide Prevention

Outcome	Study design/ number of studies (N)	Study limitations	Directness	Consistency	Precision	Reporting bias	Overall effect	Strength of evidence grade [a]
Population-level interventions versus none								
Suicide attempt	No studies	NA	NA	NA	NA	NA	NA	Insufficient
Suicide	8 observational (N>5,000,000)	High	Indirect	Unknown	Imprecise	Unknown	Decrease or none	Low
Adverse effects	No studies	NA	NA	NA	NA	NA	NA	Insufficient
Individual-level interventions (psychotherapy) versus usual care								
Suicide attempt	7 RCTs (N=670)	High	Direct	Unknown	Imprecise	Unknown	Decrease or none	Low
Suicide	4 RCTs (N=1,337)	High	Direct	Unknown	Imprecise	Unknown	Unclear	Insufficient
Adverse effects	No studies	NA	NA	NA	NA	NA	NA	Insufficient

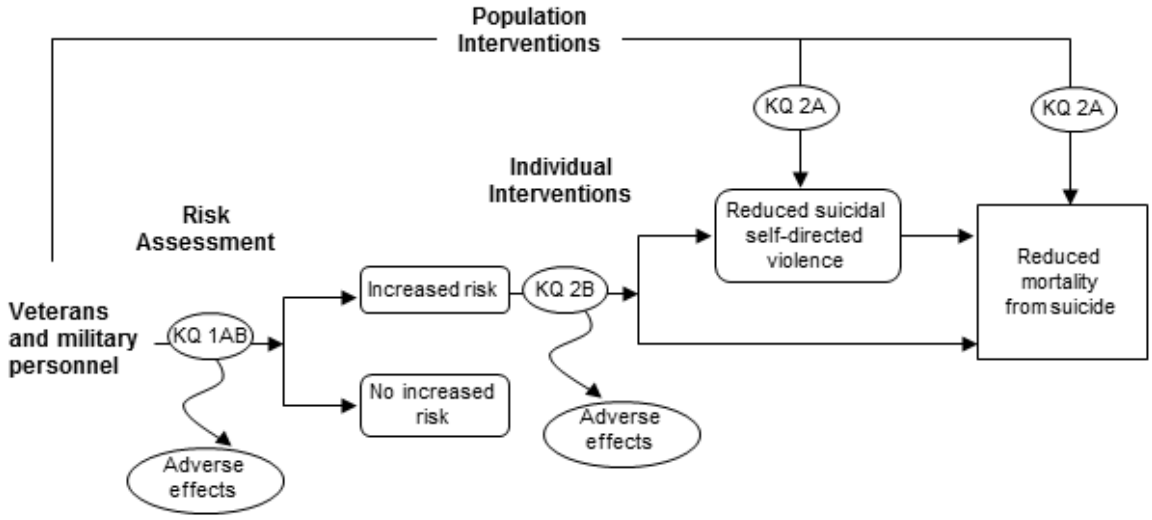
Abbreviations: NA, not applicable; RCTs, randomized controlled trials.

[a] Strength of Evidence tool from the Agency for Healthcare Research and Quality's (AHRQ) Evidence-based Practice Centers (EPC).[21]

Rating Definitions: Low=Limited confidence that the estimate of effect lies close to the true effect for this outcome. The body of evidence has major or numerous deficiencies (or both). Additional evidence is needed before concluding either that the findings are stable or that the estimate of effect is close to the true effect.

Insufficient=No evidence, unable to estimate an effect, or no confidence in the estimate of effect for this outcome. No evidence is available or the body of evidence has unacceptable deficiencies, precluding reaching a conclusion.

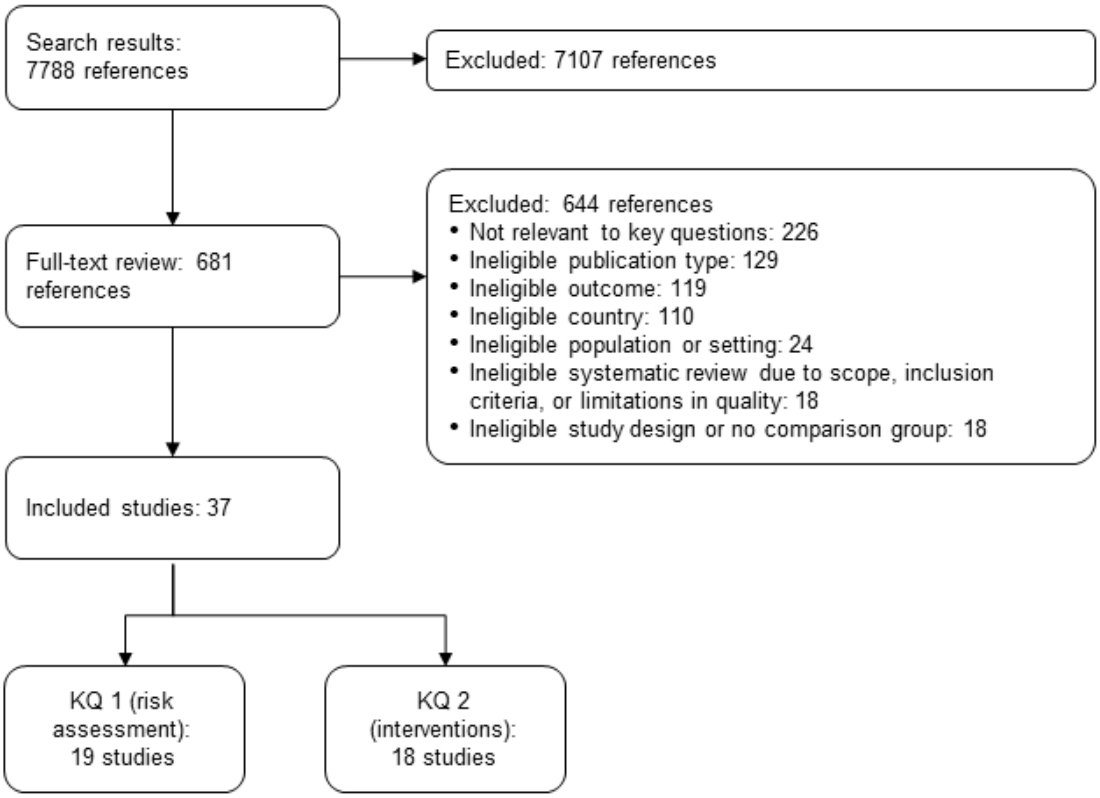
Appendix Figure 1. Analytic Framework and Key Questions



Key Questions:

1. A) What are the accuracy and adverse effects of methods to identify veterans and military personnel at increased risk for suicide and other suicidal self-directed violence? B) Does accuracy and adverse effects vary by settings, delivery modes, targeted populations, or other factors?
2. What are the efficacy/effectiveness and adverse effects of suicide prevention interventions in reducing rates of suicide and other suicidal self-directed violence in veterans and military personnel? Interventions include healthcare services directed towards A) Populations and B) Individuals.

Appendix Figure 2. Literature Flow Diagram



Note: 7708 references were identified through database searches and an additional 80 references were identified from relevant systematic reviews and primary studies.