# **Predicting Suicide & Violence**

## An Organized Approach to Risk Assessment

David A. Frenz, M.D.

Diplomate, American Board of Preventative Medicine Diplomate, American Board of Addiction Medicine Diplomate, American Board of Family Medicine

Minnesota Center for Chemical and Mental Health | 14 September 2018



## **Disclosures**

- I'm a physician in private practice
- I work as an independent contractor
  - CentraCare Health
  - Hazelden Betty Ford
  - PreferredOne
- I was previously employed by
  - HealthEast Care System (medical director)
  - North Memorial Health Care (vice president)



- I'm on faculty at the University of Minnesota
  - Evidence-based medicine
- I don't have any financial relationships with the pharmaceutical or medical device industries
- I don't intend to discuss unapproved or investigational therapies
  - I'll alert you if I'm "off label" should questions lead us there



## **Learning Objectives**

- 1. Audience members will learn how to use validated scales and measures to assess clients for suicide and violence
- 2. Audience members will appreciate how population base rates impact test performance
- 3. Audience members will recognize that it's much easier to rule out suicide and violence than to predict its future occurrence



## Why Am I Interested in This?

- I'm the medical director for two county jails
  - Stearns County
  - Benton County
  - CentraCare Health
- Suicidal ideation, self-injury and violence are very common in these settings
  - Standardized, efficient, effective workflows are required to treat patients and protect staff and the public



**Suicide Assessment** 



CONFI	IDENTIAL MEDICAL REPORT
David A. Frenz, M.D. 825 Nicollet Mall #1451 Minneapolis, MN 55402 T i 612-404-2510 F i 651-925-0360	Patient Name Date of Birth
Pat	tient Health History Form
Mental Health	
Over the last 2 weeks, how often have yo	bu been bothered by any of the following problems?
	A B C D
Little interest or pleasure in doing things	
Feeling down, depressed, or hopeless	
Trouble falling or staying asleep, or sleep	ing too much
Peeling tired or having little energy	
Foor appetite or overeating	
have let yourself or your family down	
newspaper or watching television	reading the
Moving or speaking so slowly that other p noticed? Or the opposite-being so fidg you have been moving around a lot mor	eople could have jety or restless that re than usual
Thoughts that you would be better off dea yourself in some way	d or of hurting
-	
Feeling nervous, anxious or on edge	
Not being able to stop or control worrying	
A = N C = More than	Not at all <b>B</b> = Several days half the days <b>D</b> = Nearly every day
SCORR MOR * ST (	2 13 O



Example created by DAF; does not contain PHI

	© 2016 Amerikan Psychologiai Amerikan 0233-290917512.00 http://dx.doi.org/10.1037/ba000006
Risk Factors for Suicidal Thoughts an	ud Behaviors: A Meta-Analysis of 50
Years of	Research
Joseph C. Franklin and Jessica D. Ribeiro	Kathryn R. Fox
Vanderbilt University and Harvard University	Harvard University
Kate H. Bentley	Evan M. Kleiman
Boston University	Harvard University
Xieyining Huang and Katherine M. Musacchio	Adam C. Jaroszewski
Vanderbilt University	Harvard University
Bernard P. Chang	Matthew K. Nock
Columbia University Medical Center	Harvard University
scores (3) years of seconds, studies merby examined th have been homogeneous over time, with 5 humal catego- and the average study was anoty 10 years hong, but homogenetry of existing research means that the paper associations within a very arrows methodological limit- mont STB theories. The present methodological limit- ment STB theories. The present methodological limit- future studies: In particular, these fluidings suggest the learning-based risk calgorithms. <i>Krywords:</i> meta-analysis, predictions, risk factors, re	a combined effect of multiple init factors, eint factors eine accounting for anothy 80% of all init factors rent; longer studies all out proches better prediction. The mutus-anothysic could only speak to 2017 this factor -limits that have not allowed for tests that apportionate. ally highlights record induster induces records in need for a shift in focus from risk factors to machine acidat behavior, mucide
Suicidal boughts and behaviors (STBs) are major public health	estimated one million annual deathe across the globe (World Heald
problems that have devastating impacts on individuals, families, and	Organization [WHO], 2012). To put this in perpensive, stucide ac
communities. Suicide is annong the leading causes of death world-	counts for more annual deaths than homicide, AIDS, car accidents
wide, accounting for more than 40,000 annual deaths in America	and war (CDC, 2014; WHO, 2012). These suicide deaths are in
(Centers for Disease Control and Prevention (CDC), 2014) and an	addition to an estimated 25 million annual suicide attempts (Croeby
This article was published Online First November 14, 2016. Joseph C. Finaklin and Jessica D. Ribeiro, Department of Psychology, Vanderhi University and Department of Psychology, Harvad University, Karkyna F. Fox, Department of Psychology, Harvad University, Kare H. Bendey, Department of Psychology, Horava University, Kare H. Bendey, Department of Psychology, Neurona University, Kare H. Bender, D. Myascholog, Harvad University, Xieyining Hauag and Kaherine M. Massachio, Department of Psychology, Vanderbil University	This work was partially supported by funding from the Military Suicid Research Consortium (MSRC), an effort supported by the Office of the Assistant Secretary of Defense for Health Affain (Award WBIXWH-10 2-0181; CF, 1018, MKNO, Opinion, interpretations, conclusions and ner commendations are those of the authors and are not necessarily endorsed by the MSRC or the Department of Defense. Additional support was provide by the John D- and Cathetise T. MucArthur Froadation (MKN). A portion of fails work was previously presented at the second annu meeting of the International Summit on Sucied Research in 2015 in Nev



Psych Bull 2017;143:187

- "Our analyses showed that science could only predict future suicidal thoughts and behaviors about as well as random guessing
- " In other words, a suicide expert who conducted an in-depth assessment of risk factors would predict a patient's future suicidal thoughts and behaviors with the same degree of accuracy as someone with no knowledge of the patient who predicted based on a coin flip "



### **General Approach to Testing**

- Highly sensitive test
   *followed by*
- Highly specific test(s)
   *for positive cases*



## **Specific Approach to Testing**

- Columbia–Suicide Severity Rating Scale (C–SSRS)
    *followed by*
- Suicidal Affect-Behavior-Cognition Scale (SABCS); and
- Suicide Probability Scale (SPS); and
- Secondary Suicide Questions (SSQ)
  - for positive cases







The Columbia Lighthouse Project | cssrs.columbia.edu

## Strengths

- Theoretically sound
- Brief
- Triaging rubric
- Multiple versions for various administration settings
- In the public domain



### ORIGINAL RESEARCH

Prediction of Suicidal Behavior in Clinical Research by Lifetime Suicidal Ideation and Behavior Ascertained by the Electronic Columbia-Suicide Severity Rating Scale

James C. Mundt, PhD; John H. Greist, MD; James W. Jefferson, MD; Michael Federico, MScEng; J. John Mann, MD; and Kelly Posner, PhD

#### ABSTRACT

Objective: To evaluate whether lifetime suicidal lideation with intention to act and/or suicidal behaviors reported at baseline predict risk of prospectively reporting suicidal behavior during subsequent study participation.

Method: Data from studies using the electronic Columbia-Suicide Severity Rating Scale (eC-SSRS) to prospectively monitor suicidal ideation and behaviors between September 2009 and May 2011 were analyzed. Studies included patients with major depressive disorder, insomnia, posttraumatic stress disorder, epilepsy, and fibromyalgia. Records for 35,224 eC-SSRS assessments were extracted. Incomplete assessments and eC-SSRS records from patients missing a baseline assessment or with no prospective follow-up assessments were excluded. Baseline lifetime eC-SSRS reports were categorized as negative (no lifetime ideation with intent to act or prior suicidal behavior) or positive (lifetime ideation with intent to act but no prior behavior, no ideation with intent to act but prior behavior, or both lifetime ideation with intent and prior behavior).

Results: 3.776 patients completed a baseline and 1 or more follow-up assessments. The mean follow-up period was 64 days. Of patients with negative lifetime reports. 2.4% subsequently reported suicidal behavior during study participation, compared to 12.0% of patients with lifetime ideation with intent only (ORI=-5.55;9%C, 12.65-1159), 0.9% of patients with lifetime behavior only (ORI=4.33;95% CI, 2.04-6.39), and 18.3% of patients with both (ORI=9.13;95% CI, 6.47-12.88). Sensitivity and specificity of positive reports for identifying suicidal behaviors were 0.67 and 0.26; respectively.

Conclusions: Patients reporting lifetime suicidal ideation with intent to act and/or prior suicidal behavior at baseline are 4 to 9 times more likely to prospectively report suicidal behavior during study participation.

J Clin Psychiatry 2013;74(9):887–893 © Copyright 2013 Physicians Postgraduate Press, Inc.

Submitted: January 31, 2012; accepted June 11, 2012. Online abead of print: July 16, 2013 (doi:10.4088/JCP13m08398). Corresponding author: Michael B Federico; APIO Solutions, 1818 Mariet S.; Sie 1000, Philadelphia, PA 19103 (mfederico@ert.com). Suicide is a major public health challenge, and reduction or patients. The most reliable predictor of future risk for suicidal behavior is a past history of suicidal behavior and the severity of lifetime suicidal ideation.<sup>1-3</sup> Use of a precise, uniform evaluation across the full spectrum of lifetime suicidal behaviors and ideation might provide more accurate ascertainment of risk in clinical research studies.

Ouestions concerning suicidal ideation and behavior have been raised in randomized clinical trials involving both pediatric and adult patients,4,5 prompting the US Food and Drug Administration (FDA) to draft and revise the industry guidance Suicidal Ideation and Behavior: Prospective Assessment of Occurrence in Clinical Trials.6 The guidance recommends assessment and active querving about suicidal thoughts and behavior to improve data quality and ensure prompt recognition of at-risk patients. Prospective assessment of suicidal ideation and behavior is recommended in all trials across several FDA divisions to obtain more complete, reliable, and timely identification of possible treatment-emergent symptoms by eliminating bias associated with retrospective interpretation of spontaneously reported adverse events. Use of uniform definitions and common data collection instruments can also facilitate metaanalysis of data across studies and diagnoses. The data review presented here demonstrates the potential to advance the goals and objectives of the FDA's guidance, protect patient safety, and improve data quality and analysis of clinical research studies.

The Columbia-Suicide Severity Rating Scale (C-SSRS)<sup>7</sup> is a semistructured, rater-based interview to prospectively assess the severity and frequency of suicidal ideation and behaviors. The C-SSRS preceded development of the Columbia Classification Algorithm for Suicide Assessment,<sup>8</sup> which was commissioned by the FDA to retrospectively quantify suicidal ideation and behaviors on the basis of spontaneous adverse event reports. The C-SSRS identifies the full range of suicidal ideation and behavior, was developed to monitor change from visit to visit, and has predictive safety referral circinia derived from longitudinal studies.<sup>7</sup>

The electronic C-SSRS (eC-SSRS) is a fully structured clinical interview designed and developed for computer administration using interactive voice response technology. Patients respond to standardized clinical questions, presented in a uniform fashion and faithfully branching between queries that adhere to C-SSRS clinical conventions, via touch-tone telephones. A previous study<sup>9</sup> supported the validity of the eC-SSRS as comparable to the C-SSRS The CC-SSRS has been incorporated into randomized clinical trials to evaluate clinical validity, improve procedural reliability, reduce arting bias, and facilitate more complete self-disclosure: 10-12

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J Clin Psychiatry 2013;74:887

## **C–SSRS Psychometrics**

Baseline assessments	N = 3,776
Major depressive disorder	N = 3,440 (91%)
Positive cases	N = 984 (26%)
Follow-up assessments	N = 18,513
Positive cases	N = 414 (2.2%)
Positive baseline = future behavior	Sn = 0.67; Sp = 0.76



### **C–SSRS Predictive Power**

Base Rate	NPP	РРР
1%	0.996	0.027
5%	0.978	0.128
10%	0.954	0.237
20%	0.902	0.326
30%	0.843	0.545

Assessment 2009;16:215 | NNP = negative predictive power (value); PPP = positive predictive power (value)



### **C–SSRS Bottomline**

- It's much easier to <u>rule out</u> suicidal behavior than predict its future occurrence
- In my opinion, there are better instruments for short-term trending
  - Example: Daily assessment



### 

#### RESEARCH ARTICLE

### The ABC's of Suicide Risk Assessment: Applying a Tripartite Approach to Individual Evaluations

Keith M. Harris<sup>1</sup>\*, Jia-Jia Syu<sup>2</sup>, Owen D. Lello<sup>3</sup>, Y. L. Elleen Chew<sup>4</sup>, Christopher H. Willcox<sup>5,6</sup>, Roger H. M. Ho<sup>6</sup>

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#### Abstract

GOPEN ACCESS

Citation: Harris KM, Syu JJ, Lolo OD, Chew YLE, Wilcox CH, Ho RHM (2016) The ABC's of Suicide Risk Accessment: Applying a Tripartite Approach to Individual Evaluations. PLoS ONE 10(6): e0127442. doi:10.1371/journal.pone.027442

Academic Editor: Unich S Tran, University of Vierma, School of Psychology, AUSTRIA. Received: February 4, 2015

Accepted: April 15, 2015

Published: June 1, 2015

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Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Funding: The authors have no support or funding to recort.

Competing interests: The authors have declared that no competing interests exist.

research purposes. This study applied the tripartite affect-behavior-cognition theory, the suicidal barometer model, classical test theory, and item response theory (IRT), to develop a brief self-report measure of suicide risk that is theoretically-grounded, reliable and valid. An initial survey (n = 359) employed an iterative process to an item pool, resulting in the sixitem Suicidal Affect-Behavior-Cognition Scale (SABCS). Three additional studies tested the SABCS and a highly endorsed comparison measure. Studies included two online surveys (Ns = 1007, and 713), and one prospective clinical survey (n = 72; Time 2, n = 54). Factor analyses demonstrated SABCS construct validity through unidimensionality. Internal reliability was high (a = .86-.93, split-half = .90-.94)). The scale was predictive of future suicidal behaviors and suicidality (r = .68, .73, respectively), showed convergent validity, and the SABCS-4 demonstrated clinically relevant sensitivity to change. IRT analyses revealed the SABCS captured more information than the comparison measure, and better defined participants at low, moderate, and high risk. The SABCS is the first suicide risk measure to demonstrate no differential item functioning by sex, age, or ethnicity. In all comparisons, the SABCS showed incremental improvements over a highly endorsed scale through stronger predictive ability, reliability, and other properties. The SABCS is in the public domain, with this publication, and is suitable for clinical evaluations, public screening, and research.

There is considerable need for accurate suicide risk assessment for clinical, screening, and

Introduction Suicide continues to be a leading cause of death, touching the lives of people from every corner of the globe, and ranks as the  $16^{th}$  leading cause of death []. Despite the seriousness and universality of this problem, instruments that evaluate and predict suicidality have not received

PLOS ONE | DOI:10.1371/journal.pone.0127442 June 1, 2015





PLoS One 2015;10:e0127442

## Strengths

- Theoretically sound
- Brief
- Quantitative
- Scoring rubric ("barometer")
- Can trend numbers
  - Serial administration
- In the public domain



### The suicidal affect-behaviorcognition scale

Give your patient the following instructions and questions, then total up their points using the associated scoring key. (Documents given to patients should not contain the scoring key.)

We would like to ask you some personal questions related to killing oneself. Please indicate the response that best applies to you by marking only one square.

1. Have you ever thought about or attempted to kill yourself?	Scoring key
Never	0
It was just a brief passing thought	1
I have had a plan at least once to kill myself but did not try to do it	2
I have attempted to kill myself, but did not want to die	3
I have had a plan at least once to kill myself and really wanted to die	4
I have attempted to kill myself, and really wanted to die	5

2. How often have you thought about killing yourself in the past year?

Never							Very often
coring key	0	1	2	3	4	5	

3. 1	he past year, have you had an Internal debate/argument (in your head) a	bout
whe	erto live or die?	

Never							Frequently	
icoring key	0	1	2	3	4	5		

### 4. Right now, how much do you wish to live?

Not at all							Very much	
Scoring key	5	4	3	2	1	0		
5. Right new	how	much	do vo	u wist	to di	•?		

			,-					
Notetell								Very much
Scoring key	0	2	3	4	5	[3]	[7]	

	1		1	Ľ	L.	Ľ	Ľ		
. How II	kely	is it th	atyou	will	attem	pt sul	cide s	omeday?	

Notetell							Very likely
Scoring key	0	1	2	3	4	5	20.0



PLoS One 2015;10:e0127442 (as republished in Today's Hospitalist)



Fig 2. The suicidal barometer model with descriptions of suicidality levels based on item response theory analyses. WTL = wish to live, WTD = wish to die.

doi:10.1371/journal.pone.0127442.g002



PLoS One 2015;10:e0127442





Western Psychological Services

## **Suicide Probability Scale**

- 36-item psychological test
- Obvious (face valid) questions
  - Item 32: I think of suicide
- Subtle questions
  - Item 10: I feel people appreciate the real me
- Likert-type response options (n = 4)
  - None or a little of the time
  - Most or all of the time



## **Suicide Probability Scale**

- Complex scoring
  - Weighted, non-linear item loading
  - Reverse scoring
  - Final estimate depends on base rate (presumptive risk)



- " [T]he Probability Score does not refer to the probability that a particular individual will make a lethal suicide attempt
- " Instead, it refers to the statistical likelihood that an individual belongs in the population of lethal suicide attempters "



## **Scoring Procedure**

- Calculate raw score
- Transform into T-score
- Transform into Probability score
  - Per base rate (presumptive risk)
- Make final classification



### **Probability Score**



DAVID RENZMD

Test manual, p. 66–67 | For three different base rates

### **Classification**

Probability	Classification
75–100	Severe
50–74	Moderate
25–49	Mild
0–24	Subclinical



## **Secondary Suicide Questions**

- 1. Do you <u>intend</u> to kill or hurt yourself?
- Do you have a <u>plan</u> for how you might kill or harm yourself?
   If yes, delineate
- 3. Would you reach out for help (<u>seek safety</u>) if you had strong thoughts or urges to kill or harm yourself?
  - If yes, delineate



### **Response Sets**

Reassuring	Worrisome	Emergency
Q3: Yes	Q3: <b>No</b>	Q3: Moot
Q2: No	Q2: No	Q2: Moot
Q1: No	Q1: No	Q1: <b>Yes</b>



David A. Frenz, M.D.

- Psychotherapy client
- Major depressive disorder
- Endorsed suicidal ideation on C–SSRS







Example created by DAF; does not contain PHI

Stearns County Jail	Inmate's Name
807 Courthouse Square St. Cloud, MN 56303 T I 320-259-3767 F I 320-656-6117	MAN EXAMPLE
Suicidal	Affect-Behavior-Cognition Scale
We would like to ask you some persona that best applies to you by marking one	questions related to killing oneself. Please indicate the response circle. An example appears in the box below.
Example In the past year, how often have you fe	It that you would be better off dead?
Never () - () - () - () - () - ()	Very Often
1. Mana unu augusta anda aka aka aka ak	
<ol> <li>Have you ever thought about or atte</li> <li>Never</li> </ol>	mpted to kill yourself?
It was just a brief passing though	t
I have had a plan at least once to     I have attempted to kill myself, bu     I have had a plan at least once to     I have attempted to kill myself, at	b kill myself but did not try to do it ut did not want to die kill myself and really wanted to die nd really wanted to die
2. How often have you thought about k	illing yourself in the past year?
Never () = () = () = () = () = ()	Very Often
<ol><li>In the past year, have you had an int about whether to live or die?</li></ol>	ternal debate/argument (in your head)
Never 0 - 0 - 0 - 0 - 0 - 0	Frequently
4. Right now, how much do you wish to	
Not at All O - O - O - O - O -	• Very Much / 4
5. Right now how much do you wish to die?	
Not at All O - O - O - O - O -	O-O Very Much
6. How likely is it that you will attempt suicide someday?	
Not at All 0 - • - 0 - 0 - 0 -	O Very Likely
Your Signature:	Today's Date:







Stearns County Jail 807 Courthouse Square St. Cloud, MN 56303	Inmate's Name DOB MRN EXAMPLE
F I 320-259-3767 F I 320-656-6117	1 / 1 / 1 / 1 /2
5	Secondary Suicide Questions
Ne would like to ask you some person hat best applies to you by marking on best applies to you by marking on No No Yes No Yes It you have a plan for how you m Yes If you answered YES, please def	nal questions related to killing oneself. Please indicate the response to circle. self <i>here in jail?</i> hight harm or kill yourself <i>here in jail?</i> below before answering Question 3) scribe <u>how</u> you would try to harm or kill yourself <i>here in jail</i> .
-	
<ul> <li>Would you reach out for help if you</li> <li>No</li> <li>Yes (Please fill out the box b</li> <li>If you answered YES, please des</li> </ul>	u had strong thoughts or urges to harm or kill yourself here in jail? elow) cribe how you would reach out for help here in jail.



## Disposition

- Patient is not actively suicidal and multiple indicators suggest that he/she is at low risk for suicide
- Ensure that a safety plan exists
- Repeat SABCS and SSQ at next session



**Violence Assessment** 



The Bryset Violence Checklist (BVC) assesses confusion, irritability, boisteroumess, verbal threats, physical threats, and attacks on objects as either present or absent. It is hypothesized that an individual displaying two or more of these behaviors is more likely to be violent in the next 24-hour period. All 109 consecutive referrals to four psychiatric inpatient acute units during a 2-month period were included in the study. Ratings were performed at the time of admission and three times a day for each patient—once for each working shift. Interrater reliability was adequate. Thirty-four separate incidences of violence occurred. Comparisons between ratings performed in the 24-hour interval before the incident and all other ratings suggested moderate sensitivity and good specificity of the instrument. It is concluded that the BVC is a useful instrument in predicting violence within the next 24-hour period and that the psychometric properties of the instrument are satisfactory.

### The Brøset Violence Checklist

### Sensitivity, Specificity, and Interrater Reliability

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### KIRSTEN RASMUSSEN

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Management of violent behavior among psychiatric patients constitutes a major challenge in psychiatric hospital units because it destroys the therapeutic climate, upsets fellow patients, demoralizes staff, and sometimes results in fatal damage. The need for predictive methods of identification of violent individuals on the part of those who may be subjected to the violence is reflected in the growing number of prediction studies over the past few decades. Violence is common in mainstream psychiatric settings, that is, acute and short-term wards, with injuries, stress, anxiety, and even psychosomatic illness being reported as the result of exposure to violent inpatients (Berg, Olsen, Sveipe, & Hoy, 1994). Benjaminsen and Kjærbo (1997) found that more than 90% of doctors and nurses working in psychiatric hospitals have been subjected to violence from patients at some time during their career. Furthermore, it has also been reported that violent behavior among

JOURNAL OF INTERPERSONAL VIOLENCE, Vol. 15 No. 12, December 2000 1284-1296 © 2000 Sage Publications, Inc.

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J Interpers Violence 2000;15:1284 | www.riskassessment.no | www.frenzs.org

### **The Brøset Violence Checklist**

The patient is assessed for either the presence or absence of each item. One point is awarded when the definition is met and zero points are awarded when the definition is not met. The points for all of the items are then summed, with total scores ranging from 0 to 6. If a behavior is normal for a patient, the definition is met only if there is a change from baseline (e.g., patient with dementia, more confused than usual).

Item	Definition	
Confused	Appears obviously confused and disoriented. May be unaware of time, place or person.	
Irritable	Easily annoyed or angered. Unable to tolerate the presence of others.	
Boisterous	Behavior is overtly "loud" or noisy. For example, slams doors, shouts out when talking, etc.	
Physically Threatening	Definite intent to physically threaten another person. For example, the taking of an aggressive stance; the grabbing of another person's clothing; the raising of an arm, leg, making of a fist or modelling of a head-butt directed at another.	
Verbally Threatening	Verbal outburst which is more than just a raised voice and where there is a definite intent to intimidate or threaten another person. For example, verbal attacks, abuse, name-calling, verbally neutral comments uttered in a snarling aggressive manner.	
Attacking Objects	Attack directed at an object and not an individual. For example, the indiscriminate throwing of an object; banging or smashing windows; kicking, banging or head-butting an object; or the smashing of furniture.	

Source: Roger Almvik (reprinted with his permission). The BVC is available at www.riskassessment.no and www.frenzs.org.



J Interpers Violence 2000;15:1284 (as reprinted in Today's Hospitalist)

## **Classification**

Score	Classification
0	Small
1–2	Moderate
> 2	Very high
Psychometrics	Sn = 0.50; Sp = 0.97



J Interpers Violence 2000;15:1284 | www.riskassessment.no

### **BVC Predictive Power**

Base Rate	NPP	РРР
1%	0.995	0.144
5%	0.974	0.467
10%	0.946	0.649
20%	0.886	0.806
30%	0.819	0.877

Assessment 2009;16:215 | NNP = negative predictive power (value); PPP = positive predictive power (value)



### **Contact Information**

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