COLORADO
Division of Criminal Justice
Department of Public Safety

Office of Domestic Violence and Sex Offender Management
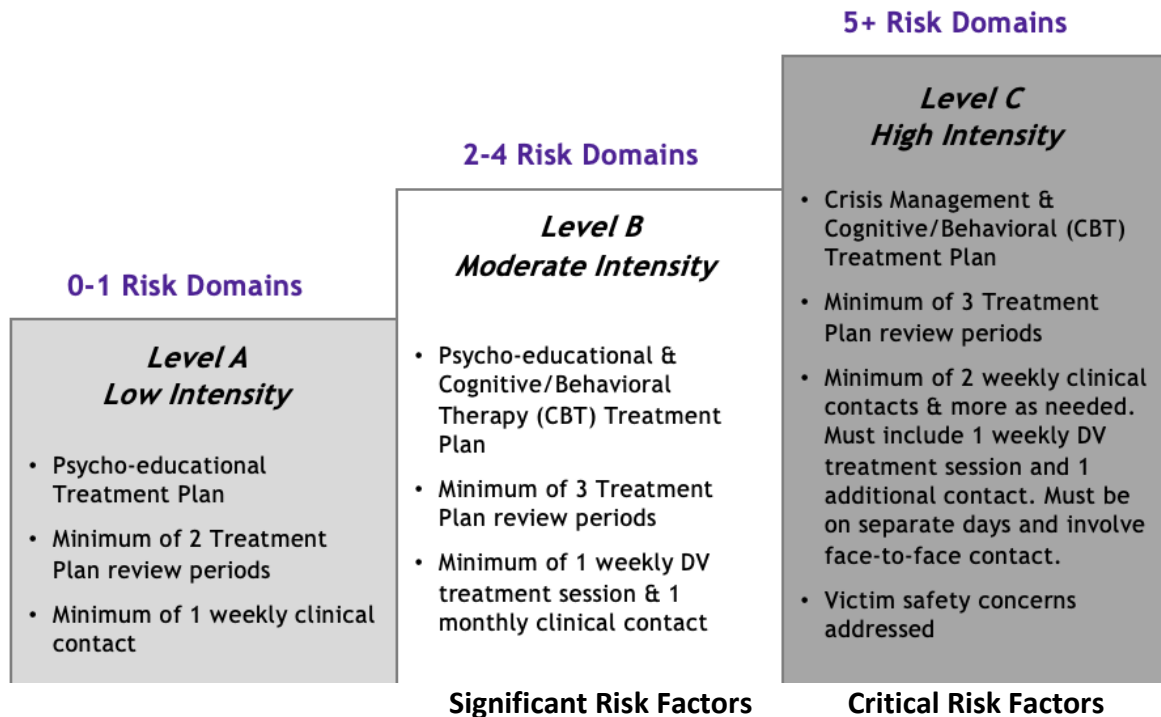700 Kipling Street, Suite 3000
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Colorado Domestic Violence Offender Management Board
Validation of the Domestic Violence Risk and Needs Assessment
May 16, 2024

Domestic Violence Risk Needs Assessment (DVRNA)

The Colorado Domestic Violence Risk and Needs Assessment (DVRNA) is a structured risk assessment used to evaluate and place domestic violent offenders into differential domestic violence treatment levels in Colorado. The standards governing the administration, scoring, and application of the DVRNA are outlined in the *Standards and Guidelines*. The DVRNA is composed of 14 risk domains (e.g., prior domestic violence-related incidents), each with a range of risk items indicative of that risk factor. It is administered and scored by DVOMB Approved Providers who have completed a full day of training on the instrument. The total DVRNA score corresponds to a recommended domestic violence treatment placement level that varies by low, moderate, or high intensity, as shown in **Figure 1**. The DVRNA operationalizes the Risk and Need principles of the RNR Model. It promotes matching treatment intensity to the risk level of the client and some of the risk domains are dynamic and reflect problems clients can seek to address and reduce through treatment.

Figure 1. DVOMB Domestic Violence Treatment Levels.

The DVRNA was initially developed in 2010 by the Treatment Review Committee of the DVOMB. The items, domains, and structure of the DVRNA were derived from a thorough review of the empirical research literature, and input from Approved Providers and DVOMB staff with extensive experience with domestic violent offenders. At the time, few other domestic violence risk instruments were available. A small validation study was conducted in 2017 found the DVRNA risk-treatment need categories were correlated with domestic violence and general recidivism. The domestic violence offenders placed in the high-risk category had higher domestic violence and general recidivism than those placed in the moderate-risk category. Too few offenders were in the low-risk category to enable them to be included in the analysis. A reliability analysis of the DVRNA was also conducted in 2021 that found adequate reliability for some domains but problems with other domains. This was largely due to low numbers of items in some risk domains and/or lack of consistency between what the items within the same domain measured.

2023 DVRNA Validation Study

The DVRNA was evaluated more extensively in 2023 to examine its predictive validity and with a view towards revising it to improve its predictive accuracy, utility for treatment planning and monitoring, and ease of use. The validation study sought to describe the DVRNA profile and recidivism rate of the sample, and examine how well the DVRNA predicted domestic violence and other recidivism.

The study included 787 individuals who had a completed DVRNA assessment between October 2018 and August 2021, and who had provided consent to release information to allow recidivism data matching. These data were collected prior to the data collection requirement from House Bill 2022-1210 in June 2022. The data record indicated that 75% of the study group were male, 25% were female, and 1.5% identified as LGBTQ.[1] No ethnicity data was available in the data record. The mean age of the study group was 35.22 years (SD=10.89 years) with females being on average 2.65 years younger than males. An additional 947 individuals with DVRNA assessments for the same period did not consent to release information and were not included in the study. Comparatively, the study group was of similar age but lower risk with a mean DVRNA Total score of 4.99 (SD=2.17) versus 5.48 (SD=2.30).

The recidivism data was extracted from the Colorado ICONS and Denver County criminal justice records, and prepared for the study by the Office of Research and Statistics, Division of Criminal Justice, CDPS. The recidivism data included all charges except minor traffic or petty offenses received during the follow-up period. The follow-up period included from the date of the DVRNA assessment date to the recidivism data extraction date of November 1, 2022, with the mean follow-up length being 2 years (748 days, SD=161 days).

DVRNA Profile

The proportion of the study group with each DVRNA risk domain and the mean DVRNA total score are shown in **Table 2**. As shown, two-thirds of the study group had a history of prior domestic violence incidents and a non-domestic violence criminal history. Most of the study group had one or more significant items present, while over half had a critical item present. Significant and critical items indicate greater risk or potential severity of domestic violence, and correspond to a recommended minimum treatment level when present.

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[1] Separate analyses for male and female gender were conducted to examine how the DVRNA performed across both genders. Females had a significantly lower domestic violent recidivism rate than males (17.6% of the domestic violence recidivists were female whereas females comprised 25% of the sample); however, the ability of the DVRNA to predict recidivism was comparable. The low number of study group members identified as LGBTQ limited the ability to examine and draw reliable conclusions about the DVRNA and recidivism in LGBTQ identifying persons. The analyses presented in this report are for the entire sample combined.

Table 1. DVRNA Total Score and Proportion with each Risk Domain (N=787).

Risk Domain	% with Risk Domain	Risk Domain	% with Risk Domain
A. Prior DV Incidents	67.9%	H. Safety Concerns	51.7%
B. Drug/Alcohol Abuse	53.7%	I. Violence Toward Family	45.9%
C. Mental Health Issues	36.7%	J. Attitudes Support DV	26.3%
D. Suicide/Homicide Concern	15.8%	K. Prior DV Tx.	26.6%
E. Weapons Concerns	30.6%	L. Victim Separated < 6 months	22.4%
F. Non-DV Crim Hx.	67.6%	M. Unemployed	22.4%
G. Obsession Victim	23.6%	N. Pro-criminal Influences	13.0%
Significant B Override Item[a]	88.6%	Critical C Override Item[b]	54.9%
Total Score (0-14) *M*=5.0 (*SD*=2.2)			

a. 15 items on the DVRNA are identified as significant items, which when present, result in an override to a minimum of level B (moderate intensity) placement if the total score corresponds with level A placement.
b. 5 items on the DVRNA are identified as critical items, which when present, result in an override to a minimum of level C (high intensity) placement if the total score corresponds with level A or B placement.

Recidivism Rates

The rate of recidivism for the study group is shown in **Table 3**. As shown, 35% of the study group recidivated during the follow-up period, with 23% of the study group recidivating with new domestic violence-related charges.

Table 2. Recidivism (Charges) Across the Follow-Up Period (N=787).

Charge Type	Number (%) with Any Charges	Range of Total Charges	Mean (*SD*) Charges
DV-Related Violence	182 (23%)	-	-
DV Assault	133 (17%)	0-52	.78 (*2.95*)
Violation Protection Order	135 (17%)[a]	0-18	.43 (*1.52*)
Child Abuse/Assault	20 (2.5%)[b]	0-9	0.05 (*0.47*)
Any Violence	191 (24%)	-	-
DV-Related Violence	182 (23%)	0-69	1.26 (*4.36*)
Non-DV Related Violence	97 (12%)	0-15	0.28 (*1.06*)
Any Recidivism	278 (35%)[c]	-	-
Non-Violent	167 (21%)	0-16	0.51 (1.45)

a. 90/135 (67%) also had a DV assault charge
b. 15/20 (75%) also had a DV assault charge
c. 182/278 (65%) also had a DV-related charge

Treatment Placement Level and Recidivism

An important question concerning the predictive validity of the DVRNA is the extent the resulting treatment levels separate domestic violence offenders into groups with different risk levels. To address this, **Table 4** shows the rate of domestic violence and any recidivism by final treatment placement level. For these recidivism analyses, the *DV Recidivism* and *Any Recidivism* categories are reported.[2] As shown, the proportion of cases with domestic violence recidivism increased twofold from placement A to placement B, and again threefold from placement B to placement C. The proportion of cases with any recidivism was similar for placements A and B, but increased twofold for placement C. The differences in recidivism by placement level were statistically significant.[3]

Table 3. Placement Level for Cases with and without Recidivism (N=787).

Treatment Level	No DV Charges[a]	DV Charges[b]	No Charges[c]	Any Charges[d]
A (low intensity)	23 (96%)	1 (4%)	19 (79%)	5 (21%)
B (moderate intensity)	162 (91%)	16 (9%)	142 (80%)	36 (20%)
C (high intensity)	420 (72%)	165 (28%)	348 (60%)	237 (40%)

a. No DV Recidivism included individuals without any charges for DV-related offenses.
b. DV Recidivism included individuals with charges for DV, VPO, or Child Abuse/Assault offenses.
c. No Recidivism included individuals with no charges for any offenses.
d. Any Recidivism included individuals with one or more charges for any offenses, excluding petty crimes.

DVRNA Scores and Domestic Violence Recidivism

In addition to examining the validity of the placement level made by the DVRNA, it is also informative to examine the degree each risk domain differentiated between those offenders who recidivated in the follow-up period and those who did not. **Table 5** shows the proportion of recidivists and non-recidivists who had each risk domain present. As shown, some risk domains were present more significantly and more often in the recidivist group than in the non-recidivist group. Other risk domains did not discriminate. The Odds Ratio (OR) is an effect size measure that indicates the degree of relationship between risk domain and recidivism. In these analyses, an OR > 1 indicates the Risk Domain was associated with Domestic Violence-Recidivism and an OR < 1 indicates the Risk Domain was associated with No Domestic Violence Recidivism.

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[2] Initially the study also examined non-domestic violence Violent Recidivism but such a high degree of overlap between domestic violence Recidivism and non-domestic violence Violent Recidivism categories existed that these analyses added little value.

[3] DV Charges vs. No DV Charges, X^2(2, N=787) = 33.35, p<.001, φ =.206; Any Charges vs. No Charges, X^2(2, N=787) = 26.86, p<.001, φ =.185. The results were similar when DVRNA recommended (vs. final) treatment level was analyzed.

Table 4. Presence of DVNRA Risk Domain By DV Recidivism (N=787).

Risk Domain Present	No DV Charges	DV Charges[a]	X^2	*Odds Ratio*
A. Prior DV Incidents	390 (64.5%)	144 (79.1%)	<.001	2.089*
B. Drug/Alcohol Abuse	310 (51.2%)	113 (62.1%)	<.01	1.558*
C. Mental Health Issues	219 (36.2%)	70 (38.5%)	n.s.	1.102
D. Suicide/Hom. Concern	96 (15.9%)	28 (15.4%)	n.s	.964
E. Weapons Concerns	171 (28.3%)	70 (38.5%)	<.01	1.586*
F. Non-DV Crim Hx.	377 (62.3%)	155 (85.2%)	<.001	3.472*
G. Obsession Victim	145 (24.0%)	41 (22.5%)	n.s.	.922
H. Safety Concerns	298 (49.3%)	109 (59.9%)	<.01	1.538*
I. Violence Toward Family	276 (45.6%)	85 (46.7%)	n.s.	1.045
J. Attitudes Support DV	153 (25.3%)	54 (29.7%)	n.s.	1.246
K. Prior DV Tx.	152 (25.1%)	57 (31.3%)	<.10	1.359
L. Victim Sep. <6 mths	129 (21.3%)	47 (25.8%)	n.s.	1.285
M. Unemployed	127 (21.0%)	49 (26.9%)	<.10	1.387
N. Pro-criminal Influences	53 (8.8%)	26 (14.3%)	<.05	1.736*
Total Score (0-14)	4.78 (2.18)	5.66 (2.0)	<.001	-

a. DV Recidivism includes any charges for DV, VPO, or Child Abuse/Assault offenses.
b. Fisher's Exact (1-sided) test of significance.
* 95% Confidence Interval for the Odds Ratio was significantly different than 1.
n.s. = no statistically significant difference between groups with and without DV Recidivism.

Length of Time to Domestic Violence Recidivism by Treatment Level

Cox regression survival analyses were used to examine domestic violence recidivism by treatment placement level as a function of time since the DVRNA assessment was conducted, as shown in **Figure 2**. An advantage of survival analyses is the method controls for the unequal follow-up periods among the participants in the study and shows the speed with which recidivism occurs. As shown, the domestic violent offenders in the highest risk group (Level C) both have greater domestic violence recidivism and at a faster recidivism rate.

The Reciever Operating Curve (ROC) for the DVRNA Total Score (0-14) is shown in **Figure 3**. ROCs are graphical plots that evaluate the accuracy of a risk prediction tool and are commonly used in predication validity studies. ROCs analyses produce a statistic, the Area Under the Curve (AUC), which reflects the probability that a randomly selected recidivist has a higher score than a randomly selected non-recidivist. An AUC of 0.5 (the diagonal red line) indicates the instrument is performing at chance level, while an AUC of 1.0 indicates it is performing perfectly.

Figure 2. Cox Regression Survival Functions for DV Recidivism by Placement Level.
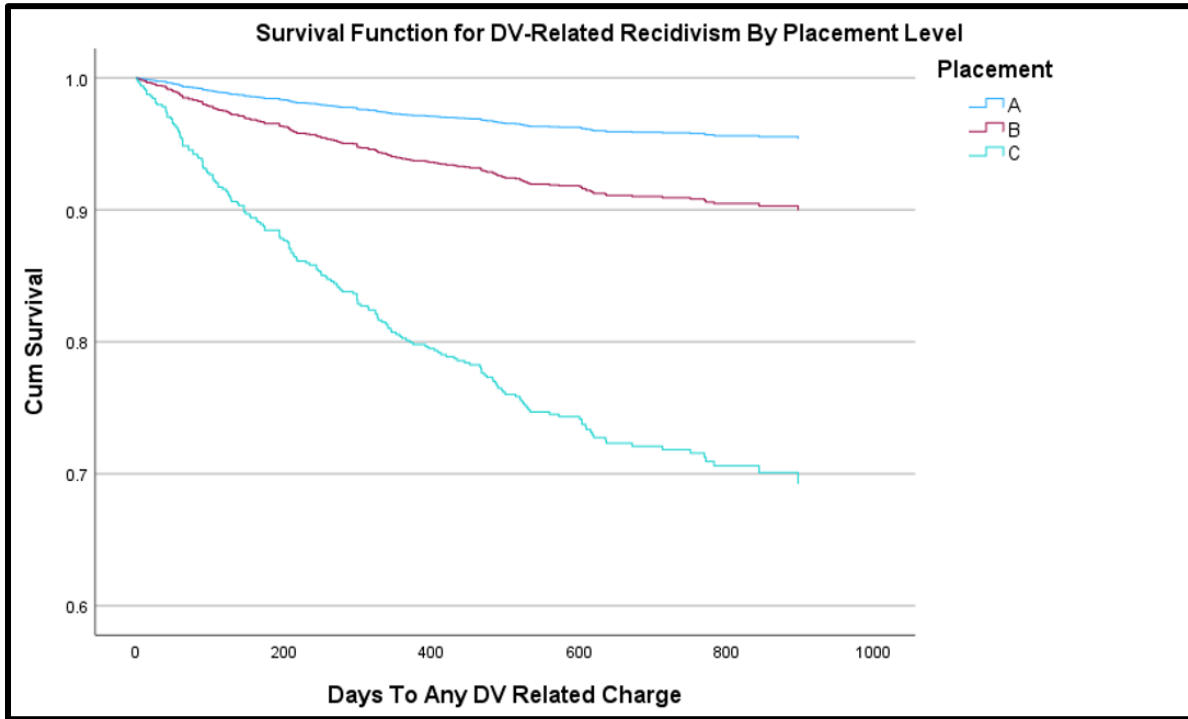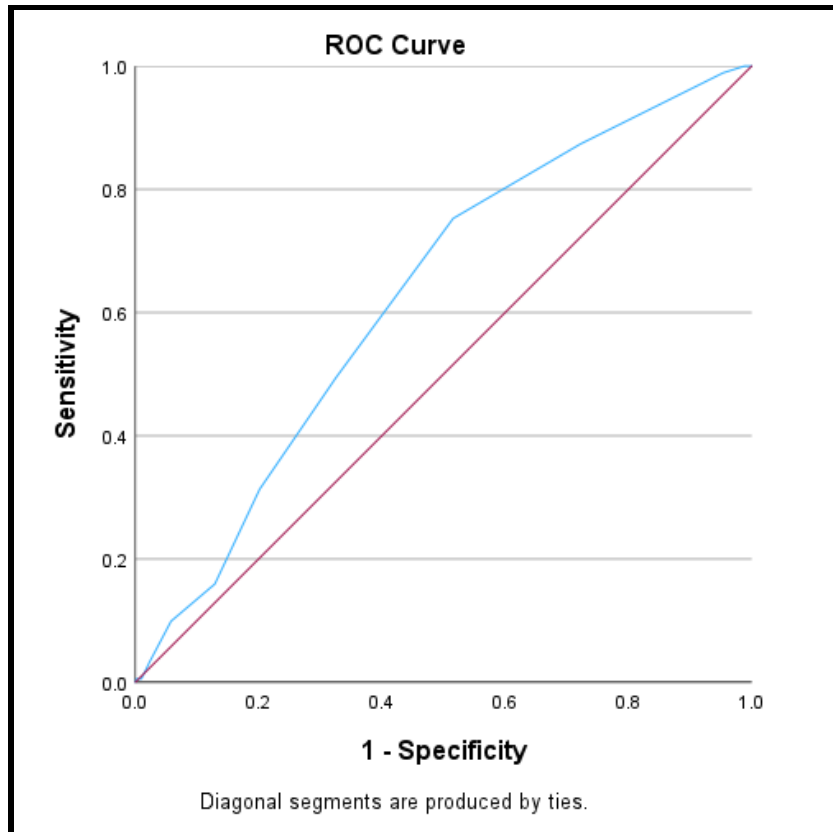

Figure 3. Receiver Operating Curve for DVRNA Total Score (0-14) and DV Recidivism.

In **Figure 3**, the AUC for the DVRNA was 0.627 (*p* < .001). This shows that it was accurately identifying a recidivist from a non-recidivist in 63 out of 100 cases. Using the common interpretive guide for risk prediction tools (Rice & Harris, 2005), the DVRNA total score had a small to moderate predictive effect. This is acceptable but also highlights potential for improving the predictive accuracy with revision of the tool.

Discussion and Implications

The current evaluation of the DVRNA builds on earlier work by involving a larger study group sample, more complete Colorado recidivism data, and a longer follow-up period. The data allowed examination of the predictive validity of the DVRNA, key findings from which were highlighted above. As seen from the DVRNA profiles for the study group, the domestic violence offenders were commonly characterized by high rates of prior domestic violence incidents, prior non-domestic violence criminal histories, substance abuse problems, and safety concerns. Over 20% of the study group had one or more new domestic violence related charge over the follow-up period (average 2 years) and 35% had at least one new offense charge (excluding minor traffic and petty offenses). The DVRNA placement level separated study group members into valid risk groups that differed by recidivism rates and examination of the DVRNA total score showed it had small to moderate predictive accuracy. Examination of the individual domain risk factors revealed some risk domains underpinned the effectiveness of the DVRNA, while others did not add significantly.

The study findings indicate the DVRNA is a valid instrument, and also highlights the potential for improvement. The findings suggest that refinement of the risk domains, and items that contribute within the domains, could create an equally or more predictive instrument that is streamlined and easier to administer. An opportunity to revise the dynamic risk factors to incorporate advancements in dynamic risk assessment and treatment planning also exists. In its present form, the DVRNA mixes dynamic and static risk factors, whereas it would be better if there were separate static and dynamic parts to the instrument as this would facilitate reassessment of dynamic risk factors across treatment. An opportunity also exists to construct the dynamic risk factor section in a way that aligns more closely with the treatment targets outlined in the *Standards and Guidelines*. Both of these proposed revisions would support evidence-based practices and strengthen integration of the RNR model into programming. Finally, a revision to the DVRNA that capitalizes on the findings of this study can also address the issues raised by the earlier reliability study.