

 Correctional Service Canada / Service correctionnel Canada

**PREDICTING RELEASE OUTCOME  
USING THE ROAD-Release Outcome  
Appraisal Device**

**George Stones, Ph.D., C. Psych.**  
**Supervised Practice**  
 CSC Central Ontario District  
 Psychological Services  
 416-320-2037

George.Stones@csc-scc.gc.ca  
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- Permission for the reproduction of any slides, used in whole or part, to be obtained in writing from Dr. George Stones: [george.stones@csc-scc.gc.ca](mailto:george.stones@csc-scc.gc.ca) (Cellular: 416-320-2037)
- Use of the Release Outcome Appraisal Device (ROAD) algorithm (see slides 33-40) to be credited to: *Stones, 2015*.
- If there is interest in collaborating on a cross validation research project piloting the ROAD (Stones, 2015) with our offender population, please contact Dr. Stones. Thanks!

## OVERVIEW/OBJECTIVES

DESCRIBE MAJOR RESEARCH FINDINGS  
CULMINATING IN THE ROAD

- PILOT STUDY RESULTS & 10 YEAR FOLLOW-UP
- 3 PHASES OF CURRENT INVESTIGATION
- MAIN FINDINGS, INCLUDING DEVELOPMENT OF THE ROAD
- INTERPRETATION OF RESULTS
- Q & A

## PILOT STUDY (Stones, 1999)

- First series of consecutive, first time admissions to program January 1997- November 1999
- N=37
- Most MMT research deals with program components
- Pilot study shifted focus onto client characteristics
- Retrospective study of predictors of "success" vs. "failure", as defined by two outcome measures (urinalysis results and parole outcome)
- 50/50 split; stabilize quickly and thrive vs. multiple lapses/breaches, suspensions, new charges, revocation

## PILOT STUDY RESULTS

Forward stepwise logistic regression revealed 4 salient predictors:

- 1) Detected or self-admitted inst drug use (yes/no)
  - 2) Educational/vocational/volunteer status (some/none)
  - 3) CMS (Wisconsin) group membership (4 types, mostly CC vs. LS)
  - 4) # of institutional offence infractions
- Overall classification rate/predictive accuracy = **84%**
  - **75% successful & 91% failure/revoked group**
  - **Can we predict treatment outcome? YES, using objective measures, quickly/easily located from unobtrusive review of offender/client's Case Mgt file**
  - **Limitations: small N, low statistical power and limited generalizability of results; significantly larger calibration sample required, with additional predictor variables**

## CURRENT INVESTIGATION: 2 Studies

- **Study 1 - "where are they now" curiosity: 10-year follow-up of n = 37 pilot group of recidivism rates and mortality data; added 37 more cases (1997-2001)**
- **Mean follow-up time approx 9 years N = 74**
- **Study 2-main study (N = 170)-correlates of Tx responsivity; MMT clients 1997-2009; responsivity defined 2 ways: forensic urinalysis & release outcome**
- **Main study designed to refine sensitivity, specificity & basic overall user mechanics of 1999 pilot study predictive instrument**
- **Modification of pilot study regression equation, to include more predictor variables reflective of offender/clients' underlying antisociality and rule violation proneness...expressions of criminally-oriented attitudes, values and lifestyle**
- **Retrospective archival design; post-dictive; isolate variables that reliably differentiate the dichotomous group outcomes (i.e., high vs. low treatment responsivity cohorts)**

## Study 1 Results (N = 74)

- Recidivism and mortality data : first 74 consecutive admissions 1997-2001
- **18 Success to WED; Revoked = 56**
- Mean follow-up 109 months = **9 years**
- 55/74 (**74.3%**) reoffended during follow-up period
- 48/55 (**87%**) were from the Revoked group
- 11/19 (**58%**) who were crime free from Successful group
- 33/55 (**60%**) committed violent offences
- 29/33 (**88%**) by Revoked grp
- Mortality rate overall: 11/74 or **15%** (no grp differences)

## Basic Research Question: Study 1

- Did the treatment compliant (successful completers) versus non-compliant (revoked) MMT clients from pilot study differ qualitatively and or qualitatively in terms of their detected criminal activity during a 10-year follow up interval post-treatment?
- Pilot 37 + next 37 clients (N = 74) - a **resounding YES**
- **MMT clients revoked 9 years earlier had accumulated:**
- **significantly more sentencing dates (5.5 vs 1.9 = .01)**
- **incurred more new convictions (10.6 vs 4.4 = .05)**
- **higher scores on Cormier-Lang scale-most serious offence (.05)**
- **committed more violent offences**
- **very strong, positive correlation between release outcome and any recidivism AND violent recidivism –both  $\chi^2 .001$**

## Main MMT Study(Study 2)

- 170 consecutive first-time admissions to MMTP from January 1997- August 2009
- Divided 170 cases along independent/criterion variable of "treatment responsivity", **defined 2 ways:**
  - a) % of clean urine results: clean vs. dirty/compromised (5 different measures-focus on opioids and cocaine)
  - b) Release outcome - completion of parole/SR to WED vs. revocation of release (binary success vs. failure)
- Started with 26 dependent (predictor) variables across 7 dimensions, plus 5 outcome measures re: drug compliance (urinalysis results)
- **3 phases:** exploratory univariate analyses (*t*-test and chi-square), forward stepwise logistic regression, confirmatory AUC/ROC

## Main Research Questions

- 1) Do treatment compliant vs. non-compliant MMT clients differ along series of objectively determined static (fixed, historical) and dynamic (fluid, changeable) variables?
  - 2) If so, what are the risk factors (predictor variables) that are differentially associated with treatment/release outcome?
  - 3) Relative weighting or importance of specific predictor variables correlated with positive treatment/release outcome?
- **Can we predict treatment/release outcome?**
  - **Centrality of predictive paradigm in risk mgt with forensic clientele by focusing on factors / specific behaviours reflecting antisociality, rule violation proneness & social conformity**

## PREDICTOR VARIABLES

- 1) Demographic factors = 4 DVs (age; race; marital status; sentence length)
- 2) MMT program factors = 2 (DAR in MMT program; # urine screens)
- 3) Drug & alcohol use = 3 (DAST; PRD; ADS; plus 5 MMTP urinalysis results, focusing on illicit opioids & cocaine (outcome measures reflecting MMT treatment compliance)
- 4) Integrity of social stability/support = 2 (accommodation type; educational/vocational/volunteer status at MMT termination)
- 5) Institutional comportment = 5 (# institutional infractions; detected inst drug use; admin seg; security level; release type)
- 6) Personality & behavioural profile = 4 (CMS category; PCL-R Total; PCL-R Factor 1-personality component; PCL-R Factor 2-behavioural)
- 7) General & violent recidivism = 6 (Offence type; Offence severity (Cormier-Lang); Prior federal sentence; Prior revocation; SIR-R1; VRAG, plus release outcome)

## AGGREGATE STATS

- **N = 170 adult males**
- **Age Mean = 37yr; Min = 23; Max = 57; sd = 7yr**
- **Average age onset of opioid and/or cocaine use late teens**
- **Sent length: Mean = 5.2 yr Min = 2 yr Max = Life (50 yr-age 27 at time of conviction)**
- **Schedule 1 (violent) = 121 Sched 2 (property/drugs) = 49**
- **Robbery/armed robbery/robbery with violence = 81 (48%)**
- **Caucasian = 148 (87%); Native American/Inuit/Metis = 8; Asian/SA = 7; AC/Black = 4; Hispanic = 3**

## DESCRIPTIVE STATS N=170

- \* **Single = 129 (76%); Married or C/L = 41 (24%)**
- \* **134/170 = 79% on SR/SRR; current rate in GTA is 66%**
- **First time fed = 101 (59%); Repeat federal = 69 (41%)**
- **Revoked during prior federal sentence = 59/69 (85%)**
- **Previously revoked current sentence = 58/170 (34%)**
- \* **Resided with family of origin and or spouse/children/dependents = 82 (48%)**
- \* **Resided at CRF = 64 (38%)**
- \* **Lived alone/non-spousal roommate = 24 (14%)**

\* = client's status at MMT termination

## DESCRIPTIVE STATS N =170

- Security: Min = 42 (25%) Med = 98 (58%) Max = 30 (17%)
- Admin Seg preceding MMT: Yes = 104 (61%)
- Detected (via urinalysis) inst drug use: Yes = 101 (59%)

Educational/vocational/volunt status at MMT termination:

NIL = 109 (64%), including being on ODSP/disability pension  
P/T work/school/volunteer = 23 (14%)  
FT = 38 (22%)

Case Mgt Strategies (CMS/Wisconsin):

CC = 109 (64%) LS = 37 (22%) ES = 4 (2%) SI = 20 (12%)

## ACTUARIAL DESCRIPTIVE STATS N= 170

- PCL-R Factor 1 = **8.2** (49 %ile) Min = 0 Max = 16 SD = 3.8
- PCL-R Factor 2 = **13.7** (65%ile) Min = 3 Max = 20 SD = 4.1
- PCL-R Total = **23.4** (55<sup>th</sup> %tile) Min = 4 Max = 37 SD=7.4
- SIR = 75/170 or **44%** in highest risk bin (lowest success rate) & **80%** rated as 50% or poorer success rate over 3 yr
- VRAG; 9 risk bins; 0% to 100% chance of violent reoffence < 7 years
- **22%** rated low risk; **62%** moderate; **16%** high risk

## MMT URINALYSIS RESULTS N=170

- **12 years of data** (forensic urinalysis) collection; **6619 urine samples**
- # of urine screens while in MMT: **Mean = 39 (span approx 6 months); Range 0-355**
- **60 clients totally clean (35%); 105 subjects (62%) clean for opioids; roughly the same (n=106) clean for cocaine metabolites**
- **VERY low** overall rates of detected illicit drug use
- Successful grp mean = approx 60 tests; revoked = 30 tests; **.001 Chi sq**
- **% of total urine screens + for illicit opioids: Mean = 5.5**  
SD = 12, Range 0-75%
- **% total urine screens + for cocaine: Mean = 7.6 SD = 19**  
Range 0-100%
- Distribution for + pee tests highly positively skewed; **Median = 0**
- **Minority of MMT clients accounted for majority of dirty pee test results**

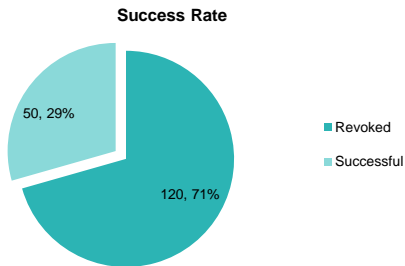
## Changing drug use profiles of MMT clients

Report			
		% of total urine screens that tested positive for illicit opioids	% of total urine screens that tested positive for cocaine metabolites
<b>Cohort (3 groups)</b>			
original 37 (1997-99)	Mean	12.3486	5.1946
	N	37	37
	Std. Deviation	17.43326	12.39000
remaining 133 (1999-2009)	Mean	4.8375	5.8083
	N	96	96
	Std. Deviation	11.50229	15.11142
final 37 (2007-09)	Mean	.5162	14.9622
	N	37	37
	Std. Deviation	1.96886	29.58606
<b>Total</b>	Mean	5.5318	7.6671
	N	170	170
	Std. Deviation	12.48569	19.03892

## Predicting treatment compliance as defined by urinalysis results

- Looked at various ways of dividing up N=170 into 2 groups based upon urinalysis results...
- Clean vs. any opioids
- Clean vs. any cocaine
- < 5% dirty vs. > 5% opioids
- < 10% vs. > 10% opioids
- < mean of 5.5% opioids vs. > 5.5% opioids
- < mean of 7.6% cocaine vs. > 7.6% cocaine
- **ANOVA, Chi-Sq and Pearson R showed statistically significant differences between the 2 groups on # of DVs**
- **Differences dissolved with stepwise logistic regression**
- **Only DV entered in model was work/school status**

## Release Outcome Stats: Odds of revocation 2.4 times that of success



## Release Outcome Analyses-Phase 1

- ANOVA, Chi-Sq and Pearson R showed significant differences between the 2 groups on # of DVs
- 31 pairwise comparisons (Successful vs. Revoked)
- 26 predictor variables, & 5 urinalysis outcome measures
- NO differences re: age, race, sent length, DAR (max # of possible days under supervision: release to WED)
- 20 comparisons were statistically significant
- 13 at  $p < .001$  level; 4 at  $p < .01$ ; 3 at  $p < .05$

## Release Outcome Results-Phase 1

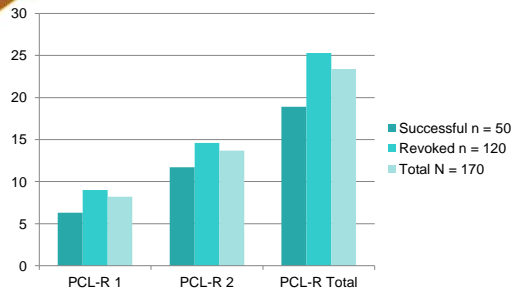
- Revoked group disproportionately single, half-way house residents who did not work or go to school on release
- Pre-release, they had higher rates of inst drug use, admission to admin seg, and inst offence infractions
- Revoked group higher rate of statutory (vs. conditional) release, particularly from maximum security facilities
- Revoked group disproportionately serving time for violent offences, belonged to LS CMS group, and higher risk measure profile (PCL-R, SIR-R1 and VRAG)
- On release, higher rates of illicit drug use & crim charges

## PCL-R Factor 1, 2 and Total scores Successful vs. Revoked groups

		Report		
		PCL-R Factor 1 score (personality component)	PCL-R Factor 2 score (lifestyle component)	PCL-R Total score
revoked	Mean	9.0392	14.6392	25.2733
	N	120	120	120
	Std. Deviation	3.66939	3.77393	6.63851
successfully completed	Mean	6.2600	11.3620	18.8820
	N	50	50	50
	Std. Deviation	3.48062	4.09853	7.25671
Total	Mean	8.2218	13.6753	23.3935
	N	170	170	170
	Std. Deviation	3.82184	4.14030	7.40477

Note: Revoked vs successful all  $p < .001$

## PCL-R scores : Successful, Revoked & Total, all comparisons $p < .001$



## RELEASE OUTCOME (Phase 1) Pairwise comparisons

- SUCCESSFUL to WED n = 50**

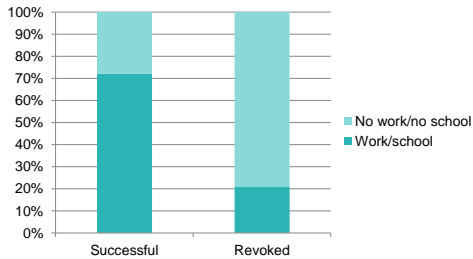
  - Worked/school 36 = 72% \*\*\*
  - PCL-R 1 = 6.2 vs. 9.0 \*\*\*
  - PCL-R 2 = 11.3 vs. 14.6 \*\*\*
  - PCL-R Total = 18.9 vs. 25.3 \*\*\* (35%ile vs. 62%ile)
  - Fewer Inst charges (38% > 5) \*\*\*
  - 2% max ; 42% min security \*\*\*
  - Detected inst drug use 34%\*\*\*
  - Admin segregation(42%) \*\*\*
  - 52% on conditional release\*\*, where revocation rate was <50%

**REVOKED n = 120**

  - Due to technical violations = 93 (77%)
  - Due to new charges & TV's = 27 (23%)
  - No work/school (95 = 79%)
  - ↑ PCL-R 1, 2 and Total
  - ↑ inst infractions (77% > 5)
  - ↑ security (24% max , 17% min)
  - ↑ inst drug use (70%)
  - ↑ rate of admin seg (69%)
  - ↑ VRAG\* & lower (worse) SIR\*\* scores
  - Predominantly SR (134/170); Revocation rate among SR=75% (101/134)

\* PCL-R scores of 22.8 = 65%ile  
\*\*  $p < .05$  \*\*\*  $p < .01$  \*\*\*\*  $p < .001$

## Employment/school attendance rates Successful vs. Revoked; p<.001



## Spearman R for stepwise logistic regression predictor variables

Table 19

Spearman Correlations Among Variables Preselected for Entry Into Stepwise Logistic Regression (N = 170)

	1	2	3	4	5	6
1 Parole outcome (1=success)	-					
2 Number of institutional charges	-.37***	-				
3 Work/School (1=Yes)	.486***	-.248***	-			
4 Security level of releasing institution <sup>a</sup>	.328***	-.455***	.149*	-		
5 Institutional drug use (1=No)	.334***	-.427***	.156*	.257***	-	
6 PCL-R Total score	-.375***	.385**	-.331***	-.356***	-.278**	-
7 Number of days at risk	-.040	-.121	.262***	.257***	-.078	-.039

Note. <sup>a</sup>Security level was coded 0 for maximum, 1 for medium and 2 for minimum security releasing institutions.  
\*p < .05 \*\* p < .01 \*\*\* p < .001

## RELEASE OUTCOME (Phase 2)

Forward stepwise logistic regression

- 1) Step 1 - Work/school status (dynamic) –Odds ratio 15.5
- 2) Step 2- Institutional drug use (static)
- 3) Step 3- PCL-R Total (primarily static)
- 4) Step 4- Days at Risk in MMT (static)
- 5) Step 5- Security level of releasing institution (static)

Estimated effect size of final model = .55; Wald ch-square p<.001

Correct prediction rate:

- 72% for successful completion to WED
- 95% for revoked (irrespective of reason)
- 88.2% overall classification accuracy

## Classification Statistics of Logistic Regression

Table 22

Classification Statistics of Parole Outcome Using Logistic Regression Results (N = 170)

Observed in the data	Predicted from the model		Percentage correct
	Revoked	Successful	
Baseline model	Revoked 120	Successful 0	100
	Successful 50	0	0
Overall percentage			70.6
Fitted model	Revoked 114	Successful 6	95
	Successful 14	36	72
Overall percentage			88.2

TP = 114 FP = 6 (Type I errors) PPP = TP / (TP + FP) = 114/120 = 95 %  
 FN = 14 (Type II errors) TN = 36 NPP = TN / (FN + TN) = 72 %  
 Sensitivity = TP / (TP + FN) = 114/128 = 89 %  
 Specificity = TN / (FP + TN) = 36/50 = 72 %

Note: TP = True Positive, FP = False Positive, FN = False Negative, TN = True Negative, PPP = Positive Predictive Power, NPP = Negative Predictive Power.

## Classification Table with PCL-R-Total in equation

Classification Table<sup>a</sup>

Observed	Parole outcome bifurcation success vs fail	Predicted		
		revoked	successfully completed	Percentage Correct
Step 1 Parole outcome bifurcation success vs fail	revoked	95	25	79.2
	successfully completed	14	36	72.0
	Overall Percentage			77.1
Step 2 Parole outcome bifurcation success vs fail	revoked	113	7	94.2
	successfully completed	26	24	48.0
	Overall Percentage			80.6
Step 3 Parole outcome bifurcation success vs fail	revoked	110	10	91.7
	successfully completed	18	32	64.0
	Overall Percentage			83.5
Step 4 Parole outcome bifurcation success vs fail	revoked	112	8	93.3
	successfully completed	16	34	68.0
	Overall Percentage			85.9
Step 5 Parole outcome bifurcation success vs fail	revoked	114	6	95.0
	successfully completed	14	36	72.0
	Overall Percentage			88.2

a. The cut value is .500

## Classification table with PCL-R-1 in equation

Classification Table<sup>a</sup>

Observed	Parole outcome bifurcation success vs fail	Predicted		
		revoked	successfully completed	Percentage Correct
Step 1 Parole outcome bifurcation success vs fail	revoked	95	25	79.2
	successfully completed	14	36	72.0
	Overall Percentage			77.1
Step 2 Parole outcome bifurcation success vs fail	revoked	113	7	94.2
	successfully completed	26	24	48.0
	Overall Percentage			80.6
Step 3 Parole outcome bifurcation success vs fail	revoked	110	10	91.7
	successfully completed	21	29	58.0
	Overall Percentage			81.8
Step 4 Parole outcome bifurcation success vs fail	revoked	111	9	92.5
	successfully completed	19	31	62.0
	Overall Percentage			83.5
Step 5 Parole outcome bifurcation success vs fail	revoked	114	6	95.0
	successfully completed	15	35	70.0
	Overall Percentage			87.6

a. The cut value is .500



## Forward Stepwise Logistic Regression Results-Phase 2

Table 20

Logistic Regression of the Effects of Work/School, Institutional Security Level, Institutional Drug Use, PCL-R Score and Days at Risk on Successful Parole Outcome (N = 170)

	B	S.E.	Wald	df	Significance (p-values)	Odds Ratio (Success)	Odds Ratio (Revocation)
Constant	4.92	1.07	21.12	1	.000	136.38	
Work/School (1=Yes)	2.74	0.52	27.91	1	.000	15.499	
Institutional Security Level			7.88	2	.019		
Maximum <sup>a</sup>	-3.24	1.20	7.26	1	.007		25.533
Medium <sup>a</sup>	-.97	0.57	2.94	1	.087		2.638
Institutional drug use (1=No)	1.01	0.47	4.59	1	.032	2.746	
PCL-R Total	-0.08	0.04	4.59	1	.036		1.083
Days at Risk (DAR)	-0.002	0.00	9.84	1	.002		1.002

Note. <sup>a</sup> Compared to Minimum

## Logistic Regression Model: Odds ratios

- Odds ratio of chance is 50:50, or 1; odds ratio of 3 is large
- Work/school status had extremely large, positive association with parole outcome: odds ratio = 15.5
- Security level: Min. 25 times more likely success than Max
- PCL-R: every 1 point increase decreased success 8%
- DAR: each day increased odds of revocation by 0.2%
- Inst drug use: No use increased odds of success 2.7 times

## Logistic Regression Model: Algorithm for ROAD

- Odds [success on parole or SR] = exp [log odds], ergo
- Log odds [chance of success on parole or SR] = 4.92 + 2.74 (if working/attending school) - 3.24 (if released from maximum security) [OR - .97 (if released from medium security)] + 1.01 (if no institutional drug use) - (0.08 x Total PCL-R score) - (0.002 x number of days at risk)

Formula expressing lateral force, as a function of angular orientation, of a 65 mph knuckleball

$$\frac{f_y}{m g} = G(\varphi) = 0.5 [\sin(4\varphi) - 0.25 \sin(8\varphi) + 0.08 \sin(12\varphi) - 0.025 \sin(16\varphi)]$$

## ROAD Decision Rules

- ROAD formula yields a number (log odds); compute exponent of that number
- If that statistic < 1, odds are guy will be revoked
- If number > 1, odds are guy will successfully reach WED
- High the number, better the odds of success
- Risk multipliers"- client's standing on one or more of the 5 factors can drastically change odds of outcome

## ROAD EXAMPLE 1

### Scenario 1

- We have a person who, upon release, is **NOT** working or going to school, **DID** use drugs while incarcerated, was released from **MEDIUM** security, his PCL-R score is **24**, and he has **365 days at risk**. The odds of successful completion of parole/SR for this person are computed as follows:
- Log odds [chance of success on parole or SR] = 4.92 - .97 - (0.08 x 24) - (0.002 x 365) = 1.30
- Odds [success on parole or SR] = exp [1.30] = **3.67**
- This guy is **3.67 times** more likely to succeed on parole/SR than to be revoked.

## ROAD EXAMPLE 2

### Scenario 2

- Individual with identical characteristics, but he **DOES** work or attend school; odds of his success on release become:
- Log odds [chance of success on parole or SR] =  $4.92 + 2.74 - .97 - (0.08 \times 24) - (0.002 \times 365) = 4.04$
- Odds [success on parole or SR] =  $\exp [4.04] = 56.82$
- This guy is **56.82 times** more likely to successfully complete his period of community supervision than to be revoked. **Odds of success improved by approximately 15 times simply by the change in work/school status.**

## ROAD EXAMPLE 3

### Scenario 3

- Next, person with similar characteristics to previous scenario, but he was released from the **MAXIMUM** security facility, the odds of his success are:
- Log odds [chance of success on parole or SR] =  $4.92 + 2.74 - 3.24 - (0.08 \times 24) - (0.002 \times 365) = 1.77$
- Odds [success on parole or SR] =  $\exp [1.77] = 5.87$
- This guy is **5.87 times** more likely to succeed on release than to be revoked. But, **being released from maximum security facility reduced odds of success by almost 10 times** compared to previous person; only change was security level (maximum versus minimum) of releasing institution.

## ROAD EXAMPLE 4

### Scenario 4

- Finally, person with similar characteristics to previous two cases but released from **MINIMUM** security :
- Log odds [chance of success on parole or SR] =  $4.92 + 2.74 - (0.08 \times 24) - (0.002 \times 365) = 5.01$
- Odds [success on parole or SR] =  $\exp [5.01] = 149.90$
- This guy almost **150 times** more likely to succeed on release than to be revoked (for 150 chances of successful completion until WED, only 1 chance of revocation).
- 3 times** more likely to succeed compared to guy with similar characteristics but released from medium security, and **30 times** more likely to succeed than his maximum security counterpart.

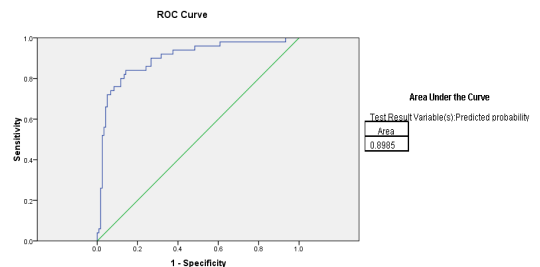
## ROAD-Reference Points

- Area Under Curve (AUC) or C (concordance) statistic
- Gives you integrated, non-parametric statistic that speaks to specificity and sensitivity simultaneously...unlike Stepwise Logistic Regression
- Value varies from 0-1; < 0.5 signifies inverse relationship; 0.5 (discriminating power not better than chance) to 1.0 (perfect discriminating power)
- The area under the ROC curve (AUC) is a way to compare classifiers
- Perfect classifier has an AUC of 1.0 and a completely bogus (random) classifier has an AUC of 0.5**
- Industry standards for best actuarial risk assessment instruments (PCL-R, VRAG, HCR-20 and LSI-R) in **.75 range**
- Our AUC**, based on predicted probabilities for 5-step forward stepwise logistic regression was **.899...excellent sensitivity & specificity**

## 2015 Cross Validation of ROAD

- Consecutive admissions 2012-13 ; N = 100, post-dictive
- Dr. Joelle Mamuza 16/21 = 76.1%\*
- Dr. Tania Stirpe 20/24 = 83.3%\*
- Me (first pull) 30/36 = 83.3%
- Me (second pull) 17/19 = 89.5%
- Overall classification accuracy 83/100 = 83%
- \* caveats/limitations of ROAD target population

## AUC Results (based on 5-step logistic regression)- Phase 3



## MAIN FINDINGS STUDY 1

- High mortality rate (15%) of MMT clients post-WED
- Revocation = negative trajectory for next decade
- Revocation = significantly higher rates of recidivism
- More serious offences
- & more violent recidivism

## MAIN FINDINGS STUDY 2

- Can predict release outcome: YES-88% accuracy
- High sensitivity (89%) & specificity (86%)
- 90% confidence (AUC/ROC analysis)
- Work/school best predictor of release outcome
- Protective factor: *Dynamic*; makes intervention possible; Risk assessment vs Risk mgt
- No work/school a proxy for anti-sociality/risk

## POINTS TO CONSIDER

- CBT programs-deficit based; abstract concepts to persons with low average IQ, low literacy skills (Gr 6-8) & poor academic Hx
- What if we reframed CBT programs-reflection of change rather than vehicle for change; elaborate screening tool of risk
- Work/school - strength-based & putting the “B” back in CBT IQ-How good a fit is CBT for average forensic client?
- What does treatment compliance really mean?

## Treatment efficacy, risk and desistance signalling

- Dosage different, but all subjects went thru same Tx program
- Current study found that the factors that differentiated the 2 groups revolved around the issue of RISK
- MMT subjects as a whole comprised 2 distinct groups, reflecting two very different risk levels
- In evaluating treatment effectiveness, crucial to control for static & dynamic risk factors

## Main Findings Study 2

- 1) Stability of model shows centrality of work/school as predictor of release outcome
- 2) Changing drug use profiles of MMT clients-moving target
- 3) Significant reduction in risk-taking behaviour while in MMT, most notably greatly reduced illicit opioid use (62% clean), moderated cocaine use (also 62% clean) and low rates of crime
- 4) Yet high rate (71%) of revocation...Incompatibility of abstinence-based decision making model versus harm reduction program delivery models
- 5) Emergence of the ROAD as a useful predictor of release outcome

## Advantages of the ROAD

- 1) Pragmatic, intuitive and face valid; easily understood; “makes sense”
- 2) Has strong theoretical basis – Andrews and Bonta’s Big 4, Maruna, Roger Boe, Christine Gillis, Urban Institute
- 3) Work/school factor that drives the robust predictive model is dynamic and bi-directional, thus provides intervention target
- 4) Strength-based and within client’s sphere of control



## Advantages of the ROAD

- 5) Case-based, thus truly psychometric, not sociometric
- 6) Focuses on time client is under sentence, not beyond
- 7) Economical to administer, compute and communicate the results to client and decision-makers; only 5 factors
- 8) Strong psychometric properties; high predictive accuracy, sensitivity, specificity, PPP and NPP
- 9) Works with broad range of adult male offenders

## CONCLUDING REMARKS

1. Empirical support for MMT efficacy to WED
2. Incompatibility of harm reduction and abstinence-based decision making models
3. Revocation a meaningful indicator of rate and type of recidivism over extended timeframes
4. Practical illustration of user friendly screening algorithm for case-based prediction of release outcome
5. The value in multi-method assessment of treatment needs, given limitations of currently used substance abuse questionnaires (DAST, PRD, ADS-low validity/reliability)

## CONCLUDING REMARKS

6. Longitudinal design illustrates important changes in drug use profiles of MMT clients over time
7. Speaks to the value in a strength-based correctional intervention focused on educational & vocational initiatives
8. Work/school example of desistance signalling
9. Highlights that a blend of static and dynamic factors are most predictive
10. Need to control for risk in forensic research
11. ROAD limitations: ill suited for long term, low functioning clients, particularly in CRFs/CCCs (minimum security)

## Future Directions

- Flesh out the issue of education/employment being key to offender success, tie in work in **desistance signaling** by Maruna
- Roger Boe's work from CSC re: **the relationship between educational upgrading and reduced recidivism rates**
- Christa Gillis and associates at Carleton on value in work initiatives for CSC clients
- **Re-entry research from Urban Institute** showing relationship between work and recidivism for offenders in the US
- Pilot study employing screening algorithm for prediction of release outcome using different offender populations

## PREDICTING RELEASE OUTCOME USING THE ROAD-Release Outcome Appraisal Device

George Stones, Ph.D., C. Psych.  
Supervised Practice  
CSC Central Ontario District  
Psychological Services  
416-320-2037  
George.Stones@csc-scc.gc.ca  
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