# The Annual Review of Interdisciplinary Justice Research Volume 7, 2018

**Edited by**
**Steven Kohm, Kevin Walby, Kelly Gorkoff,**
**Michelle Bertrand and Bronwyn Dobchuk-Land**
**The University of Winnipeg**
**Centre for Interdisciplinary Justice Studies (CIJS)**
**ISSN 1925-2420**

# Accessing Diversion from Custody: Retention and Classification in a Drug Treatment Court[1]

Michael Weinrath, Kelly Gorkoff, Joshua Watts, Calum Smee, Zachary Allard, Michael Bellan, Sarah Lumsden, and Melissa Cattini

University of Winnipeg

**Abstract:**

This study assesses potential factors influencing program retention for the Winnipeg, Manitoba, drug treatment court (DTC) such as demographic, legal, addiction, and criminal justice risk. Research presented here uses actuarial instruments incorporating static and dynamic factors in classifying risk/need: the Institutional Security Assessment (ISA), the Primary Risk Assessment (PRA), and the Level of Service/Case Management Inventory (LS/CMI). After outlining participant demographic, legal, and risk characteristics, bivariate and multivariate correlates of program attrition are examined ($N = 250$). Only a few indicators reliably increased the likelihood of program attrition: drug trafficking charge, prior criminal history, and higher actuarial risk/needs assessment rankings. Female participants did better in some circumstances. Demographic factors such as age, Indigenous status, marital status, prior employment, and education had no substantial impact on treatment retention. Drug of choice also showed no effect on retention. Actuarial instruments were effective at predicting program completion, and their use at the referral stages of DTC programming is recommended.

**Keywords:** drug court, retention, actuarial prediction, risk/need factors.

[1] Send inquiries to corresponding author: Dr. Michael Weinrath, Department of Criminal Justice University of Winnipeg 515 Portage Avenue, Winnipeg, Manitoba, CANADA, R3B 2E9. Telephone: 204-786-9100. Email: m.weinrath@uwinnipeg.ca

## Introduction

Drug treatment courts (DTCs) began in Toronto in 1998 and are the most common problem-solving courts operating in Canada. As many as 12 were recorded operating across Canada by the National Judicial Council (2011). These problem-solving courts combine deterrence-based strategies such as drug testing and curfews with therapeutic interventions such as individual and group counseling. Anchoring these processes are status hearings in front of a judge who may deliver praise, encouragement, or reprimands to participants.

Accessing justice through DTCs can come in various forms. Obtaining entry into a drug treatment court as an alternative to custody can be difficult, but staying in that program may be even more challenging. Reducing program mortality and keeping individuals in addictions treatment has become an important focus for policy makers. The importance of drug treatment court program retention is linked to the common finding that participants who graduate have better outcomes such as lower recidivism, less drug use, and greater measures of well-being (GAO, 2011; Gutierrez & Bourgon, 2009; Kornhauser, 2016; Latimer, Morton-Bourgon, & Chrétien, 2006; Mitchell, Wilson, Eggers, & MacKenzie, 2012; Wilson, Mitchell, & MacKenzie, 2006; Newton-Taylor, Patra, & Gliksman, 2009; Somers, Rezansoff, & Moniruzzaman, 2014).

Retention is a consistent concern of DTC programs, which have varying attrition as indicated by graduation rates (i.e., successful completion). Graduation rates fluctuate wildly, with reports ranging from a low of 11% to a high of 89% (GAO, 2011; Latimer et al., 2006; Mitchell et al., 2012). An important way to improve retention rates is to assess factors that impact program completion. Traditional predictors explored in the literature include demographic factors such as age, gender, race, and drug of choice as well legal factors of crime type, prior criminal history, and prior violence. Guastaferro (2012) has argued that use of classification instruments like the Level of Service Inventory-Revised (LSI-R) will improve measurement of drug court client potential because they focus on needs as well as

risk. Such instruments are more theoretically sound and empirically supported than are clinical judgements by practitioners because they are built around Andrews and Bonta's Risk-Needs-Responsivity (RNR) model (Andrews & Bonta, 2010). Theoretically informed, better measurement of offender risk and needs (and subsequent incorporation into case planning) has long been advocated by sponsors of the RNR. Relying solely on static factors such as prior criminal history or behaviour on parole are said to be unhelpful because they provide an increasingly pessimistic view of repeat offenders (Gendreau, Little, & Goggin, 1996). Conversely, dynamic factors can assist in identifying criminogenic needs that give case management targets for counselors and assist offenders in attitudinal and behavioural change. Furthermore, dynamic indicators such as pro-criminal attitudes, negative companions, or substance misuse are areas amenable to intervention, while there is little that can be done about static factors such as a long record of prior crimes.

In this paper, we examine retention factors in a Canadian urban drug court, with particular interest in the utility of risk assessment instruments in predicting program success. Once having accessed a program, what influence do demographic, legal, and risk factors have on treatment success?

**Retention and Drug Treatment Courts**

In the addictions field, an important key to program success is retention because keeping participants in a program to completion leads to greater post-treatment achievements such as lower re-offence rates and less substance abuse (GAO, 2011; Mitchell et al., 2012). In DTCs, the weight of the research indicates most programs do not graduate even half of their clients. Latimer et al. (2006) found an average retention rate of 45.2% in their meta-analysis of 54 DTCs , while in a more recent review of adult DTCs, Mitchell and his colleagues (2012) found 62.3% of programs had graduation rates ranging from 26%–50%. Mitchell and his colleagues (2012) also indicated that 11% of U.S. DTC programs achieved low completion

rates of between 0%–25%. Although studies vary in their definitions, Canadian DTCs also have low retention rates. Using data on program completion — or more specifically the formula of: graduates / (total graduates + participants terminated from program) = graduation rate — researchers reported 18% graduation in Vancouver (Somers et al., 2014), 16% in Toronto (Newton-Taylor et al., 2009), and 11% in Regina (Justice Canada, 2009). In 2009 the Edmonton and Winnipeg DTCs, at 28% and 36% (respectively), displayed higher graduation rates than other Canadian programs, placing them in a mid-range of North American DTCs.[2]

Since graduation among DTC cases is critical, a logical strategy involves determining factors related to retention and adjusting referral criteria accordingly. In the extant research, factors related to drug court retention fluctuate substantially. This is likely due to sizeable variation in program design and operation, as well as differences in local client profile. For example, in some programs different drugs may predominate (e.g., heroin in one and cocaine in others), there may be more minorities in some locales than others, and so on. Programs vary in referral criteria, length, program modality, and tolerance for non-compliance. Definitions of retention and graduation (drop-out, opt-out, or recidivist) also change from program to program. Thus, there are many reasons why a DTC's retention rates are higher or lower than others.

Despite this, the research does point to some consistent findings. DTC participants more likely to graduate were older, female, Caucasian, and of higher socioeconomic status, as indicated by higher education, employment on admission, or showing employment and housing stability (Brown, Zuelsdorff, & Gassman, 2009; Butzin, Saum, & Scarpitti, 2002; Gray & Saum, 2005; Mateyoke-Scrivner,

[2] There may have been some changes since the national study in 2009. Ottawa was at only 11% retention in their initial program phase, but reported an improvement to 45.1% graduation during 2011–2014 (Moloney & Budd, 2015). Calgary recently reported a 50% graduation rate. Of course, different criteria for retention make some of these comparisons inconclusive (Liska, 2015).

Webster, Staton, & Leukefeld, 2004; Newton-Taylor et al., 2009). Minorities such as African Americans in the U.S. and Indigenous peoples in Australia have been found less likely to graduate (Brown et al., 2009; Gray & Saum, 2005; Rysavy, Cunningham, & O'Reilly-Martinez, 2011). Participants not likely to complete drug court were those with serious criminal histories and risk profiles and those possessing extensive mental health and treatment histories (Evans, Huang, & Hser, 2011; Gray & Saum, 2005; Newton-Taylor et al., 2009). Research on attrition and drug type has been inconclusive. Some research shows hard drug users do better, others worse, while other studies find no difference by drug of choice (Bouffard & Richardson, 2007; Rempel, Green, & Kralstein, 2012; Shaffer, Hartman, Listwan, Howell, & Latessa, 2011).

In Canada, an urban-based DTC retention study showed some consistencies with the extant literature. Newton and his colleagues (2009) in Toronto used multiple discriminant analysis and concluded the most salient predictors of program attrition were age (younger clients were more likely to exit), age at first arrest, property and administrative breach crimes (e.g., failed to appear in court), and not being engaged in treatment (measured by substance abuse and treatment participation in the first month of drug court). Gender, marital status, and socioeconomic factors were not related to the probability of graduation.

Low retention rates leave DTCs open to criticism. Skeptics argue that drug court funds would be better spent taking drug offenders out of the justice system and placing them into drug treatment within the healthcare system, or funding methadone maintenance or other support programs (Fischer, 2003; HIV Network, 2011). However, this critique is weakened by findings from other studies that show almost all drug treatment regimens have low retention rates. Furthermore, intensive addiction interventions in the healthcare system also lose participants who quit, relapse, or both. Not surprisingly, factors related to program mortality in DTCs are also

observed in the general addictions treatment field. This includes treatment for illicit drugs, alcohol, smoking, and eating disorders (Cissner & Rempel, 2005; Fassino, Pierò, Tomba, & Abbate-Daga, 2009; Hoseinie et al., 2017; Mateyoke-Scrivner et al., 2004).

Researchers have had difficulty trying to identify consistent factors associated with DTC retention, likely due to program variation. This indicates the need for further study. Treatment retention is a critical feature of most programming, and expanding our knowledge base is crucial if programmers are to improve treatment programs. In addition, most of the research on DTC retention is based on U.S. courts, necessitating a need for research outside the U.S. This paper adds to the DTC retention literature by examining factors influencing retention in the Winnipeg Drug Treatment Court (WDTC), a court found in the capital city of the prairie province of Manitoba.

**Risk/Needs Instruments and DTC Assessments**

Assessing and classifying offenders through use of structured instruments exploded in the 1970s and risk scales have seen a steady evolution since. First-generation instruments use individual judgement of classification staff or probation officers for new inmates or probationers ("You look low risk to me"), while second-generation instruments focus on static, unchangeable factors such as prior crimes, prior technical violations, prison sentences, and past involvement in treatment. An example of a second-generation device is the Institutional Security Assessment (ISA), an eight-item predictor using static indicators such as current offence, prior offence, youth history, and past parole performance (Weinrath & Coles, 2003). The ISA is used by Manitoba Corrections to classify provincial inmates (remand and those serving less than two years). Third-generation instruments emphasize the inclusion of dynamic factors such as employment, education, residential stability, addiction, and attitude. With this third generation also came the notion of validation — testing items in scales to assess whether or not high scores were related to recidivism or institutional misconduct. An early example of a third-generation device was the Wisconsin scale, which used 12

items that usually broke down into dichotomous or three category responses (Baird, Heinz, & Bemus, 1981; Henderson & Miller, 2013). Perhaps because of its simplicity in scoring, the Wisconsin scale has remained popular despite lukewarm or even negative research findings on its predictive validity (Gendreau et al., 1996; Henderson & Miller, 2013). Manitoba Corrections adopted the Wisconsin model in the form of the Primary Risk Assessment (PRA), an instrument that also mixed some static items such as criminal history with employment, academic-vocational needs, and other dynamic predictors. It was used primarily for adults on probation. Probably the most popular third-generation instrument worldwide is LSI-R, which uses 54 items across 10 domains to classify offenders. It is arguably the most successful of the third-generation instruments, given a considerable number of supportive studies from different nations using varied outcomes such as recidivism, institutional misconduct, and mental health diversion (Andrews & Bonta, 2010; Evans et al., 2011; Kelly & Welsh, 2008; Olver, Stockdale, & Wormith, 2014; Persson, Belfrage, Fredriksson, & Kristiansson, 2017). Guastaferro (2012) has argued for an integration of the LSI-R into DTC assessment. In her study comparing track I (less serious crimes) and track II (more serious crimes) DTC participants, Guastaferro found the LSI-R worked to effectively distinguish between high and lower needs groups, which in turn influenced treatment regimens and intensity, better managing scarce resources (Andrews et al., 2011).

Fourth-generation instruments are the next step in offender classification and more completely integrate assessment with actual case management. Conceptually, fourth-generation instruments make even less use of static predictors and better identify criminogenic needs and provide pathways for counselors to effectively intervene. The Level of Service/Case Management Inventory (LS/CMI) evolved from the LSI-R and uses 43 items focused on eight risk and need domains: criminal history, education/employment, family/marital, leisure/recreation, companions, alcohol/drug problems, pro-criminal

attitudes, and anti-social pattern. It provides low/medium/high/very high risk/need categories and provides structure and guidance for case management. Research to date has been generally supportive of its predictive validity (Andrews et al., 2011; Olver et al., 2014). One of the advantages of the LS/CMI is its ability to better measure different facets of need compared to instruments such as the Wisconsin scale or the LSI-R. For example, in some risk instruments addiction might be measured ordinally as "no," "some problems," and "serious problems" (0,1,2), while the LS/CMI uses eight items to specify current and past effects of alcohol/drug addiction, which is a more rigorous assessment of risk/need.

DTC cases impress as a distinct subgroup of offenders. Building on Guastaferro's assertions about the utility of risk assessment in DTC case planning, we will test the utility of instruments offering both static and dynamic predictors on retention. We will investigate this research question by using WDTC retention as an outcome using the ISA (all static items), PRA (limited mix of static and dynamic), and LS/CMI (detailed instrument with some static but mostly dynamic items).

## Methods and Analytical Strategy

### Winnipeg Drug Treatment Court Setting

The WDTC began taking clients in 2006, funded by the Canadian federal government with in-kind resources from Manitoba's provincial government. It was originally governed by a steering committee, which included the presiding DTC judge and representatives from federal and provincial justice departments, the Addictions Foundation of Manitoba (a large non-governmental organization mostly funded by government), police, and various community agencies. In 2015 funding arrangements changed, and formal supervision is now provided by Manitoba's provincial justice department, although the federal government still provides the most substantial operating monies. The program operates on a harm reduction model, with a fair level of participant relapse tolerated by

the court. The WDTC is a demanding program, requiring participants to attend weekly status hearings in front of a designated judge, abide by curfews, and complete urinalysis. Subjects are provided with incentives and sanctions dependent on progress or setbacks. Intensive programming is provided in-house through weekly individual counseling and group work. External resources such as residential treatment are utilized on a case-by-case basis. Clients must complete five phases before graduating, with treatment running 12 to 18 months, and 3 months of abstinence required to graduate. While employment is discouraged when first admitted to the WDTC, work or school is encouraged in the latter stages of the program, as is involvement with community groups such as 12-step programs like Narcotics Anonymous (NA).

**Risk/Needs Scales**

Initially, the WDTC did not use risk/needs scales, but the scales were incorporated into assessment after the first few months of operation. First, the 12-item PRA was used to classify admissions into low/medium/high risk levels. The PRA was applied by drug court staff from 2006–2009, and was retired when Manitoba Corrections went to the LS/CMI in 2011. Significantly, the PRA and LS/CMI were not used to assess referrals. They were completed after admission to assist in case management. Thus, although there was some overlap, the PRA was used during the first four years of the study period, the LS/CMI for the last four.

The ISA classifies inmates as low, medium, or high risk and consists of eight static items. The ISA is not used in the case management process by the WDTC. It was added by us as a research tool during the early stages of our evaluation and provided a consistent measure of risk encompassing the entire eight-year program period. We accessed provincial automated institutional records for ISA rankings.

A previous Manitoba Corrections validation study of inmate classification contrasted the ISA and PRA using recidivism and

institutional misconduct (Weinrath & Coles, 2003). The ISA and its static indicators performed better than the PRA by measures of gamma and Area Under the Curve statistics. The authors cautioned, however, that the measurement of dynamic factors in the PRA was rather crude, and suggested that more complex indicators (such as those included in the LS/CMI) might well result in more accurate classification of inmates.

Data for the current research comes from two sources. First are the WDTC evaluations, beginning in 2007 until 2016. Although evaluation reports included a variety of research variables, we were primarily interested in data on graduation and discharge. Second, official records (client files and two provincial Manitoba Justice Department automated data bases) were accessed to manually construct a data base. We supplemented client file demographic, legal, and risk data by using Correction Information Management System (COMS) and Criminal Court Automated Inmate Network (CCAIN) databases. The study was approved by the University of Winnipeg Human Research Ethics Board.

**Descriptive and Retention Variables**

All completed drug court cases from 2006–2014 ($N = 250$) were used for descriptive analysis. For purposes of this study, our dependent variable retention was conceptualized by graduation. We used status as *graduates* (1) to designate individuals who were retained in the program, and *discharges* (0) as individuals who were not. Active cases were not included. In bivariate and multivariate analyses we eliminated opted out cases (voluntarily left the program within six weeks), and compared graduates with those discharged. Opt-outs were not considered failed retention because they were never formally discharged from the WDTC — they chose another program approach or decided to go to jail.

Demographic variables that were collected from program files and automated data bases included age, gender, ethnicity, marital status (married/common-law, single, separated/divorced), education

(ordinal grades 5–8, 9–10, 11–12, post-grad, university grad), and employment (full-time/part-time/student/retired, or unemployed). DTC files also provided information on drug of choice (cocaine, crystal methamphetamine, marijuana). Legal data encompassed most serious charge type (violent, property, drug trafficking), presence of a prior criminal history, or a history of violence (yes/no).

To further assess retention, actuarial risk scales ISA, PRA, and LS/CMI were used. The PRA and LS/CMI essentially assessed two different time periods of the WDTC: 2006–2010 (PRA) and 2011–2014 (LS/CMI). To appraise a broader subsample, we collapsed the PRA and LS/CMI into one measure to examine the utility of instruments incorporating dynamic instruments in predicting retention. We acknowledge that there are clear differences between the number of items on the PRA and the LS/CMI (12 to 43), and the LS/CMI measures items such as criminal history and attitudes much more thoroughly. Regardless, both instruments utilize a number of similar items and use low-, medium-, and high-risk rankings. The LS/CMI adds a "very high" category but we collapsed "high" and "very high" into one "high" rating. The alternative to this was to use only the static items of the ISA, which is not a sufficient control for individual risk. We acknowledge this makes part of our analysis more exploratory in nature, but the alternative, to omit use of the dynamic risk/needs instruments, seems to us to be a wasted opportunity to assess their utility against other traditional predictors from the literature.

**Analytical Strategy**

After describing the sample's demographic, legal, and risk attributes, we conducted bivariate and multivariate analyses on retention factors using cross-tabular analysis and logistic regression. This enabled examination of patterns of program failure, and appraisal of whether some characteristics should preclude drug court referral or perhaps should require more targeted programming or referral criteria (e.g., if males are more likely to fail, do they need different programming? If

violent offenders are unsuccessful, should there be changes in referral criteria?). Chi-square analyses were applied to test for statistical significance with the nonparametric tabular data, while the *t* distribution was used for interval and/or ratio data (e.g., age). Binary logistic regression, using retention as the dependent variable, was utilized to better rank the impact of different factors on retention. We collapsed marital status into a dichotomous variable (married/common-law = 0, single/divorced/separated = 1) to identify cases without significant past or recent relationships for the multivariate analysis. We also collapsed employment categories to indicate who was constructively occupied or retired (employed full-time or part-time, student, or retired = 1, unemployed = 0).

## Results

### Referrals and Participant Profile

The mean time in the WDTC was about 11 months (334.2 days), with a range of 30–1,002 days, or 30 months (Table 1). There was significant program time variation in the sample, as indicated by a substantial standard deviation (*SD* = 209.8). This was likely due to some outliers who were in the program for about three years (Note: time in program is aggregated and might not be counted consecutively — individuals who absconded from the program and returned were credited with the actual days spent in the program). Program retention rates showed 37.6% graduation, compared to 62.4% drop-outs. The retention rate of 37.6% is at the lower end of what is reported in the literature — it is high for Canadian DTCs. The first drug of choice for participants was cocaine (59.3%), followed by crystal methamphetamine (15.3%), and marijuana (10.9%). Other drugs of choice included opiates, amphetamine, ecstasy, and sedatives (14.5%).

**Table 1: Program Information, Demographic, Legal, and Risk Profile of WDTC Clients 2006–2014**

| **Time in Program** | N | *%* | **Program Retention** | N | *%* |
|---|---|---|---|---|---|
| Mean | 334.2 | | Graduated | 94 | *37.6%* |
| SD | 209.8 | | Discharged | 156 | *62.4%* |
| Range | 30–1,002 | | Total | 250 | *100.0%* |
| 0–30 | 6 | *2.0%* | | | |
| 31–90 | 32 | *12.8%* | **Drug of Choice** | | |
| 91–184 | 33 | *13.2%* | Cocaine | 147 | *59.3%* |
| 185–365 | 73 | *29.2%* | Crystal Methamphetamine | 38 | *15.3%* |
| 365 & up | 107 | *42.8%* | Marijuana | 27 | *10.9%* |
| Total | 250 | *100.0%* | Other | 42 | *14.5%* |
| | | | Total | 248 | *100.0%* |
| **Gender** | | | Missing | 2 | |
| Male | 159 | *63.6%* | | | |
| Female | 91 | *36.4%* | **Marital Status** | | |
| Total | 250 | *100.0%* | Married /Common-Law | 58 | *23.5%* |
| | | | Single | 176 | *71.3%* |
| **Age** | | | Separated/Divorced | 13 | *5.2%* |
| Mean | 30.0 | | Total | 247 | *100.0%* |
| SD | 8.8 | | Missing | 3 | |
| Range | 18–64 | | | | |
| 18–25 | 91 | *36.4%* | **Education** | | |
| 26–39 | 121 | *48.4%* | Grades 5–8 | 23 | *9.4%* |
| 40 & up | 38 | *15.2%* | Grades 9–10 | 82 | *33.5%* |
| Total | 250 | *100.0%* | Grades 11–12 | 107 | *43.7%* |
| | | | Post-Secondary | 29 | *11.8%* |
| **Ethnicity** | | | University Grad | 4 | *1.6%* |
| Caucasian | 131 | *52.8%* | Total | 245 | *100.0%* |
| First Nations/Métis/ Non status | 111 | *44.8%* | Missing | 5 | |
| Black | 2 | *0.8%* | | | |
| Asian | 4 | *1.6%* | **Employment** | | |
| Total | 248 | *100.0%* | Employ FT, PT, Student, Retired | 74 | *30.0%* |
| Missing | 2 | | Unemployed | 173 | *70.0%* |
| | | | Total | 247 | *100.0%* |
| **Convictions For**[a] | | | Missing | 3 | |
| Drug Trafficking | 159 | *63.6%* | | | |
| Property(B&E, Theft, Fraud) | 118 | *47.2%* | **Criminal History** | | |
| Violent (Assault/Robbery) | 50 | *20.0%* | Yes | 203 | *81.2%* |
| | | | No | 47 | *18.8%* |

| | | | | | |
|---|---|---|---|---|---|
| **Institutional Security Assessment** | | | Total | 250 | *100.0%* |
| Low | 218 | *87.2%* | **History of Violence** | | |
| Medium | 32 | *12.8%* | Yes | 70 | *28.0%* |
| High | 0 | *0.0%* | No | 180 | *72.0%* |
| Total | 250 | *100.0%* | Total | 250 | *100.0%* |
| | | | | | |
| **Level of Service/Case Mgt. Inventory**[b] | | | **Primary Risk Assessment** | | |
| Low | 10 | *12.8%* | Low | 10 | *9.3%* |
| Medium | 16 | *20.5%* | Medium | 44 | *40.7%* |
| High | 39 | *50.0%* | High | 54 | *50.0%* |
| Very High | 13 | *16.7%* | Total | 108 | *100.0%* |
| Total | 78 | *100.0%* | Missing/Not Applicable | 142 | |
| Missing/Not Applicable | 172 | | | | |
| | | | **Combined PRA-LS/CMI** | | |
| | | | Low | 20 | *10.6%* |
| | | | Medium | 59 | *31.4%* |
| | | | High | 109 | *58.0%* |
| | | | Total | 188 | *100.0%* |
| | | | Missing | 62 | |

[a] *Conviction type indicates any offence for violence, drug trafficking, or property crime, so totals do not add up to 288 or 100.0%.*

[b] *Missing data for both the LS/CMI and PRA appears large but reflects that one instrument was used for the first five years of the program, the other in the last four.*

WDTC cases showed as mostly young, male, Caucasian, single, with a high school education or better, but were unemployed when they entered the program. The average age was 30 and participants ranged in age from 18 to 64. Around 63.6% of the clients were male. About half of WDTC clients were Caucasian (52.8%), and Indigenous referrals were slightly less, at 44.8%. A large majority, 71.3% of referrals, were single, 23.5% reported married or common-law status, and only 5.2% indicated that they were separated or divorced. About 57% of referrals had an education of grade 11 or higher, and 7 out of 10 participants indicated that they were unemployed when admitted to the WDTC.

WDTC participants were mostly drug traffickers with a non-violent prior criminal history. Drug trafficking convictions were present for 63.6% of participant referrals, 47.2% had a property conviction, and 20.0%, or one in five, had a committed a violent crime. Over 80%

had a prior criminal history, but only 28% had a prior conviction for violence.

The actuarial risk scales suggested that although some participant referrals may have more serious criminal profiles, they present as low risks in an institutional setting. Considering how risk is measured is vital in understanding differences in estimated security or supervision levels. The ISA focuses on static indicators, which are based on past behaviour of individuals, not amenable to change via correctional programming. Thus, because the ISA classified a preponderance (85.1%) of WDTC participants as low security inmates, this signified that the past criminal and institutional misconduct histories of most drug court participant referrals were relatively minor, at least compared to other provincial inmates. In practical terms, most DTC cases would be minimum security if housed in a provincial jail. When we added the dynamic factor needs from the PRA or LS/CMI, however, the picture changed. Ratings by risk/needs scales such has the PRA or LS/CMI, used more extensively in community corrections, show higher rankings because of higher needs. Recall dynamic factors are focused on attributes amenable to change, such as education, employment, or residential stability. The PRA classified 50.0% as high risk and 40.7% as medium. The LS/CMI identified even more elevated risk than the PRA, with two-thirds (66.7%) of eligible cases ranked as high or very high.

**Table 2 Drug Court Retention by Program Demographic, Legal, And Risk Factors**

| Variable | | | | T or Chi-Square | Missing |
|---|---|---|---|---|---|
| **Retention** | | | | | |
| **Retained** | 94 | | | | |
| | 37.6% | | | | |
| **Discharged** | 156 | | | | |
| | 62.4% | | | | |
| **Age** | Mean/SD | | | | |
| **Retained** | 29.9 | | | | |
| | (8.1) | | | | |
| **Discharged** | 30.3 | | | t = .39 | 0 |
| | (9.8) | | | | |
| **Gender** | Male | Female | | $\chi^2$ | |
| **Retained** | 59 | 35 | | | |
| | 37.1% | 38.5% | | | |
| **Discharged** | 100 | 56 | | | |
| | 62.9% | 61.5% | | 0.05 | 0 |
| **Indigenous** | Yes | No | | | |
| **Retained** | 37 | 56 | | | |
| | 33.3% | 40.9% | | | |
| **Discharged** | 74 | 81 | | | |
| | 66.7% | 59.1% | | 1.49 | 2 |
| **Marital Status** | Marr/ComLaw | Single/Div/Sepa | | | |
| **Retained** | 20 | 72 | | | |
| | 34.5% | 38.1% | | | |
| **Discharged** | 38 | 117 | | .248 | |
| | 65.5% | 62.9% | | | |
| **Education** | Grd 0–10 | Grd 11–12 | PostSec | | |
| **Retained** | 33 | 40 | 18 | | |
| | 31.4% | 37.4% | 54.5% | | |
| **Discharged** | 72 | 67 | 15 | | |
| | 68.6% | 62.6% | 45.5% | 5.73 | 5 |
| **Employment** | Employed/Ret/Student | Unemployed | | | |
| **Retained** | 58 | 34 | | | |
| | 33.5% | 45.9% | | | |
| **Discharged** | 115 | 40 | | | |
| | 66.5% | 54.1% | | 3.42 | 3 |
| **Cocaine** | Yes | No | | | |
| **Retained** | 55 | 39 | | | |
| | 37.4% | 37.9% | | | |
| **Discharged** | 92 | 64 | | | |
| | 62.6% | 62.1% | | 0.01 | 0 |
| **Crystal Meth** | Yes | No | | | |
| **Retained** | 14 | 80 | | | |
| | 36.8% | 37.7% | | | |
| **Discharged** | 24 | 132 | | | |
| | 63.2% | 62.3% | | 0.01 | 0 |
| **Drug Trafficking** | Yes | No | | | |
| **Retained** | 70 | 24 | | | |
| | 44.0% | 26.4% | | | |
| **Discharged** | 89 | 67 | | | |
| | 56.0% | 73.6% | | 7.69*** | 0 |
| **Violent** | Yes | No | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Retained** | 13 | 81 | | | |
| | 26.0% | 40.5% | | | |
| **Discharged** | 37 | 119 | | | |
| | 74.0% | 59.5% | | 3.58 | 0 |
| **Property** | Yes | No | | | |
| **Retained** | 34 | 60 | | | |
| | 28.8% | 45.5% | | | |
| **Discharged** | 84 | 72 | | | |
| | 71.2% | 54.5% | | 7.35** | 0 |
| **Criminal History** | Yes | No | | | |
| **Retained** | 64 | 30 | | | |
| | 31.5% | 63.8% | | | |
| **Discharged** | 139 | 17 | | | |
| | 68.5% | 36.2% | | 16.97*** | 0 |
| **History of Violence** | Yes | No | | | |
| **Retained** | 27.1% | 41.7% | | | |
| | 51 | 105 | | | |
| **Discharged** | 72.9% | 58.3% | | | |
| | 70 | 180 | | 4.35* | |
| **ISA** | Low | Medium[a] | | | |
| **Retained** | 90 | 4 | | | |
| | 41.3% | 12.5% | | | |
| **Discharged** | 128 | 28 | | | |
| | 58.7% | 87.5% | | 8.67** | 0 |
| **PRA** | Low | Medium | High | | |
| **Retained** | 6 | 27 | 12 | | |
| | 60.0% | 61.4% | 22.2% | | |
| **Discharged** | 4 | 17 | 42 | | |
| | 40.0% | 38.6% | 77.8% | 16.81*** | 142 |
| **LS/CMI** | Low[a] | Medium | High | Very High[a] | |
| **Retained** | 9 | 9 | 7 | 3 | |
| | 90.0% | 56.3% | 17.9% | 23.1% | |
| **Discharged** | 1 | 7 | 32 | 10 | |
| | 10.0% | 43.8% | 82.1% | 76.9% | |
| | 10 | 16 | 39 | 13 | 172 |
| | | | | 21.99*** | |
| **PRA-LS/CMI** | Low | Medium | High | | |
| **Retained** | 15 | 36 | 23 | | |
| | 75.0% | 61.0% | 21.1% | | |
| **Discharged** | 5 | 23 | 86 | | |
| | 25.0% | 39.0% | 78.9% | | |
| | 20 | 59 | 109 | 37.46*** | 62 |

**p< .05, **p< .01, ***p< .001 [a]Cell has count less than five.*

Combining the two for descriptive purposes and collapsing the LS/CMI categories of high and very high, we see 58.0% of referrals were very high/high risk, 31.4% were medium risk, and only 10.6% were low risk. This means that most WDTC cases have high needs in a variety of domains and are likely better positioned in a DTC than

prison or even probation to directly access services. Caution must be taken in interpreting dynamic risk characteristics: all cases had an ISA available but even combining the two instruments 25.3% of participants had neither a PRA nor a LS/CMI completed.[3]

Potential demographic predictors such as age, gender, and race did not have any significant impact on the likelihood of DTC retention. The average age difference between discharges and graduates was quite small and not significant (30.3–29.9). Male and female retention rates were almost identical (37.1% and 38.5%). There was a small 7.6% difference in retention between Indigenous and Caucasian drug court cases, but this did not achieve statistical significance ($\chi^2 =$ 1.49, ns). About two-thirds of both married/common-law (65.5%) and single/divorced/separated status (62.9%) were discharged. Being more educated and employed had modest positive impacts on retention. Having more than high school education increased the possibility of retention moderately by 17.1% compared to having grades 11–12. Being employed full-time/part-time or having retired status enhanced the likelihood of graduation by 12.4%. Neither educational nor employment category differences in retention were sufficient to achieve statistical significance at $*p< .05$.

Drug of choice (i.e., being addicted primarily to cocaine, crystal methamphetamine, or other another drug) did not influence drug court graduation. A violent crime conviction decreased the likelihood of retention by a modest 14.5% ($\chi^2 = 3.58$, ns), property crime by 16.7% ($\chi^2 = 7.35$, $**p< .01$). Conversely, a drug trafficking charge meant a greater likelihood of graduating, effectively increasing the

[2] The loss of data was not random but differences were felt small enough to make use of PRA-LS/CMI data worthwhile. The subsample was higher risk overall, making it of greater interest in predicting retention. In a comparison with missing cases, the LS/CMI and PRA subsample had significant differences in prior crimes, history of violence, and ISA rankings of medium. The missing data subsample was slightly less educated, more likely to have violent, property, or drug convictions. No differences were observed by age, gender, Indigenous status, living arrangements, employment, or drug of choice. Results are available on request.

likelihood of retention by 17.6%; a difference achieving statistical significance ($\chi^2 = 7.87$, $^{**}p < .01$).

Consistent with the literature on drug courts and other forms of criminal justice intervention, prior behaviour (criminal history, record of violence, and higher risk status) showed the largest influences on retention. The likelihood of graduation was decreased by having a criminal history (32.3%), past history of violence (14.6%), and being classed medium risk by the Institutional Security Assessment (28.8%). All three indicators were statistically significant at $p < .05$ or lower. Past behaviour and static risk factors in a coherent classification instrument appeared to be at least moderately effective at predicting retention and outperformed most simple demographic, drug type, and crime type factors. The ISA did have one cell with a count less than five.

At most, we had only 188 of 250 cases (75%) when we applied the PRA and LS/CMI to discharge, and results should be interpreted cautiously. Results tend to favour the use of dynamic risk instruments as predictors of program retention. For the PRA, 60% of low, 61.4% of medium, and 22.2% of high risk were retained; the results showed moderately strong differences and were statistically significant ($\chi 2 = 16.81$, $^{***}p < .001$). Ideally, the PRA would have distinguished better between low and medium categories (both were around 60%). The LS/CMI performed better, with graduation rates of 90% for low, 56.3% for medium, 17.9% for high, and a slightly higher 23.1% rate for very high. Ideally, "very high" retention rates would be lower than "high," showing a linear or at least progressive impact of risk/need, but the differences still distinguished higher from lower risk quite well, and these effects were statistically significant ($\chi 2 = 21.99$, $^{***}p < .001$). However, findings should be interpreted carefully because two cells had frequencies below five.

We avoided the small cell count problem by collapsing the two instruments, and merging the high/very high categories for the

LS/CMI. This hybrid instrument achieved the following graduation rates: low was 75%, medium was 60%, and high/very high was 21.2%, quite substantial differences that were unlikely to have occurred by chance ($\chi^2 = 37.46$, ***$p < .001$).

In summary, all legal and risk variables produced statistically significant findings in our bivariate analysis. A history of more serious criminal behaviour was a consistently strong indicator of clients who would have a more difficult time graduating from the drug treatment court.

**Multivariate Analysis**

We ran our dependent variable of retention against demographic, program, legal, and risk/need predictors (Table 3). Results indicated that few factors strongly influenced retention. Net of the effects of other predictors, the odds of graduation went down by a factor of 3.6 for those with a criminal history.[4] Likewise, odds diminished by three for those with high security ISA ratings (*Exp(B)* = -.318), but the ISA indicator did not achieve statistical significance. Our logit approximation of variance explained, the Nagelkerke $R^2$ was .188, a modest amount of predictive power. To better examine the influence of indicator variables, we ran a step-forward regression (only the most salient predictors are retained in the equation), and found having a drug conviction almost doubled the odds of retention (*Exp(B)* = 1.953, *$p < .05$). Prior criminal history and low security showed similar effects to our main equation, with the ISA effects now more stable than in our first equation (*p< .05). The Nagelkerke $R^2$ estimate was a smaller .16. Other demographic, legal, and past behavioural variables did not have a sufficient impact on retention to qualify for inclusion.

[3] To interpret a log odds less than 1.0, one method is to invert the exponent b by dividing by 1. Thus, log odds of .282 can be estimated as 1/282 = 3.546, a decrease in the likelihood of graduating in the drug court, or, expressed another way, an increase in the odds of graduating of 3.6 for those without a criminal history. For a discussion of interpretation of log odds in logistic regression, see Davies, Crombie, and Tavakoli (1998).

**Table 3: Multivariate Logistic Regressions of Program Retention on Demographic, Legal, and Risk Factors**

| Variable | *B (SE)* | *Odds Ratio* | *B (SE)* | *Odds Ratio* | *B (SE)* | *Odds Ratio* | *B (SE)* | *Odds Ratio* |
|---|---|---|---|---|---|---|---|---|
| **Constant** | .896 (1.147) | | 1.297 (.706) | | 2.564 (1.512) | | 2.249 (.740) | |
| **Female** | .017 (.342) | 1.017 | | | .831* (.421) | 2.397 | .835* (.377) | 2.305 |
| **Age** | .013 (.019) | 1.013 | | | .009 (.023) | 1.010 | | |
| **Indigenous** | .028 (.327) | 1.028 | | | -.170 (.402) | .844 | | |
| **Single/Div/Sep** | -.005 (.362) | .995 | | | .373 (.448) | 1.452 | | |
| **Education (0,1,2)** | .141 (.222) | 1.152 | | | .090 (.280) | 1.094 | | |
| **Employed** | .480 (.325) | 1.617 | | | .093 (.409) | 1.098 | | |
| **Cocaine Choice** | -.009 (.352) | .991 | | | -.012 (.435) | .988 | | |
| **Crystal Meth Choice** | .130 (.482) | 1.139 | | | -.001 (.604) | .999 | | |
| **Drug Conviction** | .421 (.425) | 1.524 | .669* (.309) | 1.953 | .884 (.500) | 2.421 | .914** (.370) | 2.494 |
| **Violent Conviction** | -.130 (.483) | .878 | | | .012 (.552) | 1.012 | | |
| **Property Conviction** | -.444 (.359) | .642 | | | -.006 (.454) | .994 | | |
| **Criminal History** | -1.264*** (.391) | .283 | -1.267*** (.361) | .282 | -.752 (.534) | .471 | | |
| **History of Violence** | .022 (.411) | 1.022 | | | .047 (.476) | 1.048 | | |
| **ISA** | -1.039 (.596) | .354 | -1.144* (.565) | .318 | -.557 (.637) | .561 | | |
| **PRA-LS/CMI** | | | | | -1.301*** (.316) | .272 | -1.492*** (.289) | .225 |
| ***Nagelkerke $R^2$*** | .188 | | .160 | | .348 | | .317 | |
| ***N*** | 244 | | 244 | | 185 | | 185 | |
| **Missing** | 6 | | 6 | | 65 | | 65 | |

****p< .001, **p< .01, *p< .05, standard errors are in parentheses.*

Our third equation used all factors in an equation and introduced the PRA-LS/CMI hybrid measure, which resulted in a smaller sample (*N* = 185). It demonstrated a higher Nagelkerke $R^2$ of .342, likely because of the inclusion of the dynamic hybrid classification instrument. Again, most demographic, drug choice, and legal factors had little effect on retention. The drug charge conviction effect was larger but not statistically significant (*Exp(B)* = 2.361, ns), but being female in this equation more than doubled the odds of graduation (*Exp(B)* = 2.337, **p*< *.05*). ISA medium security again decreased the odds of graduation, but the effect was reduced and not statistically significant, likely because the ISA was moderately correlated with the hybrid variable (*r* = .303), which uses some similar static items. Likewise, prior criminal history did not exert a consistent nor strong effect in this subsample. Effects for other potential retention factors were weak and unstable. The hybrid dynamic risk/needs predictor showed the odds of retention declining as risk increased. For each downward change in risk level (high to medium, medium to low), the odds of graduation increased by a factor of 3.7 (*Exp(B)* = .272, ****p*< .001). Overall, our ability to explain variation increased substantially from the first equation, as the Nagelkerke $R^2$ was .348, up from .188. In an effort for a more parsimonious equation we ran a step-forward regression. The predictive power indicated by the Nagelkerke declined to .317, effects for gender were unchanged, drug charge increased slightly, and the hybrid variable odds ratio increased from 3.7 to 4.4 impact per risk level.

**Discussion**

In our assessment of retention factors in the WDTC, we observed that few demographic or legal factors had any impact, which is generally consistent with the literature. The most significant finding was the predictive strength of the risk instruments. While bivariate analysis showed that variables such as prior criminal history or violence had an impact on retention, their predictive power either disappeared or was attenuated in the controlled analysis. In the case of the ISA, its eight static items better assessed prior behaviour within a criminal justice context than demographic or drug type factors. The more

detailed PRA and LS/CMI, however, showed that the inclusion of dynamic items clearly improved classification. Variation in probability shown by the Nagelkerke statistic was improved in the subsample using the risk/need hybrid, and the composite PRA-LS/CMI measure showed the most substantial effects in predicting retention. We should not be surprised by this strong performance, as these items more carefully assess demographic factors such as employment, education, and addiction issues, as well as static factors such as prior criminal history. Better measurement leads to better classification, which increases the possibility of retention.

Gender influenced retention, with women twice as likely as men to graduate, albeit in a subsample. This has not been found consistently in other studies (Butzin, Saum, & Scarpitti, 2002; Gray & Saum, 2005). Drug traffickers also showed a greater likelihood of graduating. Drug traffickers as a group are socially skilled and good problem solvers (Desroches, 2005), and many actively market their drugs to make more money. Once caught and facing jail time, their abilities make them good candidates to succeed in a program such as drug court. In their classic study of West Coast drug dealers, Adler and Adler (1983) outline how difficult life events such as incarceration or the threat of imprisonment can force drug dealers out of that business and into a legitimate lifestyle.

There are limitations to this study. We relied on official records for the majority of our data and often it was only roughly measured. Furthermore, any errors made in coding by officials may have been passed on to us. The subsample with the hybrid risk instrument was higher risk than the 25% of cases not included; thus, it may not be representative. Ideally, a 10-year study with a large sample and consistent use of all three classification instruments would have been a stronger research design; in all likelihood, however, such a study is unrealistic because no work group would commit resources to administer all three instruments.

There are two important things to be taken from this study for policy-makers. First, this study reaffirmed the general approach of drug treatment courts; although their retention rates are not excellent, they work fairly equitably for most subgroups. Thus, with respect to accessing justice, there is no need for individual programs to dramatically change admission criteria or curriculum by age, race, marital status, education, or employment history. While efforts to improve programming may not need not to be targeted, they should be ongoing. Qualitative research might be of some benefit in this regard; interviews with drug court clients may well provide helpful directions for programming (Contrino, Nochajski, Farrell & Logsdon, 2016). Policy makers are cautioned against excluding higher-risk cases because this would limit the ability of the drug treatment court to act as an alternative to custody. Secondly, this study shows the value of using risk instruments to classify drug treatment court admissions, particularly risk/needs instruments that include dynamic factors such as the PRA and the LS/CMI. Their ability to predict program retention far outstripped that of general demographic and legal factors, and we strongly support the use of such third- and fourth-generation instruments in drug court case planning, as recommended earlier by Guastaferro (2012). Even before initial classification, however, use of actuarial instruments is recommended at the referral stage; such action should ultimately improve case management and overall retention.

For researchers, our findings add support to the contention that including dynamic factors in classification not only provides a more effective strategy for individual planning, but incorporating such items into risk instruments will prove more effective than static items alone in predicting important criminal justice treatment outcomes such as retention. While the ISA is a useful classification device in its own right, it did not discern retention as well as the classification instruments that included dynamic with static items. Future drug court research is recommended that utilizes the strong features of the LS/CMI and other fourth-generation instruments. High-risk recruits

tend to have lower retention rates, and may be a group to focus on in future research and retention efforts.

**Funding:** This research was funded through the Steering Committee of the Winnipeg Drug Treatment Court. Design of the research was initially conducted through a consultative process with WDTC representatives. Evaluation reports provided by the University of Winnipeg researchers were written independent of the drug court organization and in no way were intended to represent the views of the Winnipeg Drug Treatment Court management or treatment staff. In all funding agreements researchers at the University of Winnipeg retained ownership of the data and have the right to publish without consultation or review.

**References**

Adler, P. A., & Adler, P. (1983). Shifts and oscillations in deviant careers: The case of upper-level drug dealers and smugglers. *Social Problems, 31*, 195–207. doi:10.2307/800211

Andrews, D. A., & Bonta, J. (2010). *The psychology of criminal conduct*: Routledge.

Andrews, D. A., Bonta, J., Wormith, J. S., Guzzo, L., Brews, A., Rettinger, J., & Rowe, R. (2011). Sources of variability in estimates of predictive validity. *Criminal Justice and Behavior, 38*, 413–432. doi:10.1177/0093854811401990

Baird, S., Heinz, R., & Bemus, B. (1981). *Wisconsin case classification/staff deployment project:* A two-year follow-up report (From Classification, P 35-72, 1981-See NCJ-78470).

Bouffard, J. A., & Richardson, K. A. (2007). The effectiveness of drug court programming for specific kinds of offenders: Methamphetamine and DWI offenders versus other drug-involved offenders. *Criminal Justice Policy Review, 18*, 274–293. doi:10.1177/0887403406298621

Brown, R. T., Zuelsdorff, M., & Gassman, M. (2009). Treatment retention among African Americans in the Dane county drug treatment court. *Journal of Offender Rehabilitation, 48*, 336–349. doi:10.1080/10509670902851042

Butzin, C. A., Saum, C. A., & Scarpitti, F. R. (2002). Factors associated with completion of a drug treatment court diversion program. *Substance use & misuse, 37*, 1615–1633. doi: 10.1081/JA-120014424

Cissner, A. B., & Rempel, M. (2005). *The state of drug court research: Moving beyond "do they work?"* Center for Court Innovation, New York, NY.

Contrino, K. M., Nochajski, T., Farrell, M. G., Logsdon, E. (2016). Factors of success: Drug court graduate exit interviews. *American Journal of Criminal Justice, 41*, 136–150. doi:10.1007/s12103-015-9333-3

Davies, H. T. O., Crombie, I. K., & Tavakoli, M. (1998). When can odds ratios mislead? *British Medical Journal, 316*, 989–991

Desroches, F. J. (2005). *The crime that pays: Drug trafficking and organized crime in Canada.* Canadian Scholars' Press.

Evans, E., Huang, D., & Hser, Y.I. (2011). High-risk offenders participating in court-supervised substance abuse treatment: Characteristics, treatment received, and factors associated with recidivism. *The Journal of Behavioral Health Services & Research, 38*, 510. doi: 10.1007/s11414-011-9241-3.

Fassino, S., Pierò, A., Tomba, E., & Abbate-Daga, G. (2009). Factors associated with dropout from treatment for eating disorders: a comprehensive literature review. *BMC Psychiatry, 9*, 67. doi: 10.1186/1471-244X-9-67

Fischer, B. (2003). Doing good with a vengeance: A critical assessment of the practices, effects and implications of drug treatment courts in North America. *Criminal Justice, 3*, 227–248.

GAO – General Accouting Office. (2011). *Adult drug courts: Studies show courts reduce recidivism, but DOJ could enhance future performance measure revision effort* (GAO-12-53). Washington, DC: US Government Accountability Office Retrieved from available at http://www.gao.gov/assets/590/586793.pdf.

Gendreau, P., Little, T., & Goggin, C. (1996). A meta-analysis of the predictors of adult offender recidivism: What works! *Criminology, 34*, 575–608.

Gray, A. R., & Saum, C. A. (2005). Mental health, gender, and drug court completion. *American Journal of Criminal Justice, 30*, 55–69.

Guastaferro, W. P. (2012). Using the level of service inventory-revised to improve assessment and treatment in drug court. *International journal of Offender Therapy and Comparative Criminology, 56*, 769–789. doi:10.1177/0306624X11413879

Gutierrez, L., & Bourgon, G. (2009). *Drug treatment courts: A quantitative review of study and treatment quality*. Ottawa, ON: Public Safety Canada.

Healey, J. (2012). *The essentials of statistics: A tool for social research*: Nelson Education.

Henderson, H., & Miller, H. A. (2013). The (twice) failure of the Wisconsin Risk Need Assessment in a sample of probationers. *Criminal Justice Policy Review, 24*, 199–221. doi:10.1177/0887403411422410

HIV Network. (2011). *Impaired judgment: Assessing the appropriateness of drug treatment courts as a response to drug use in Canada*. Retrieved from Toronto, ON: http://www.aidslaw.ca/site/wp-content/uploads/2013/09/DTCs-Oct11-E.pdf

Hoseinie, L., Gholami, Z., Shadloo, B., Mokri, A., Amin-Esmaeili, M., & Rahimi-Movaghar, A. (2017). Drop-out from a drug treatment clinic and associated reasons/Taux d'abandon dans un centre de traitement de la dépendance aux drogues et raisons associées. *Zbornik Radova Ekonomski Fakultet u Rijeka, 23*, 173–181. doi: 10.1111/j.1465-3362.2010.00275.x

Justice Canada. (2009). *Drug treatment court funding program summative evaluation*. Retrieved from Ottawa, Ontario: http://www.justice.gc.ca/eng/rp-pr/cp-pm/eval/rep-rap/09/dtcfp-pfttt/dtcfp.pdf.

Kelly, C. E., & Welsh, W. N. (2008). The predictive validity of the Level of Service Inventory—Revised for drug-involved offenders. *Criminal Justice and Behavior, 35*, 819–831. doi:10.1177/0093854808316642

Kornhauser, R. (2016). The effectiveness of Australia's drug courts. *Australian & New Zealand Journal of Criminology*, 0, 1–23. doi:10.1177/0004865816673412

Latimer, J., Morton-Bourgon, K., & Chrétien, J.-A. (2006). *A meta-analytic examination of drug treatment courts: Do they reduce recidivism?* Ottawa, ON. Department of Justice, Research and Statistics Division.

Liska, A. (2015). Calgary Drug Treatment Court Fact Sheet. Calgary, AB: Calgary Drug Treatment Court Society.

Mateyoke-Scrivner, A., Webster, J. M., Staton, M., & Leukefeld, C. (2004). Treatment retention predictors of drug court participants in a rural state. *The American Journal of Drug and Alcohol Abuse, 30*, 605–625. doi: 10.1081/ADA-200032304

Mitchell, O., Wilson, D. B., Eggers, A., & MacKenzie, D. L. (2012). Assessing the effectiveness of drug courts on recidivism: A meta-analytic review of traditional and non-traditional drug courts. *Journal of Criminal Justice, 40*, 60–71. doi:10.1007/s11292-007-9040-2

Mitchell, O., Wilson, D. B., & MacKenzie, D. L. (2007). Does incarceration-based drug treatment reduce recidivism? A meta-analytic synthesis of the research. *Journal of Experimental Criminology, 3*, 354–375. doi:10.1016/j.jcrimjus.2011.11.009

Moloney, K. & Budd, J. (2015). *Overview of the DTCO program.* Ottawa, ON: Rideauwood Addiction and Family Services.

National Judictial Institute. (2011). *Problem-solving in Canada's courtrooms: A guide to therapeutic justice.* Ottawa, Ontario. www.nji-inm.ca

Newton-Taylor, B., Patra, J., & Gliksman, L. (2009). Toronto drug treatment court: Participant intake characteristics as predictors of "successful" program completion. *Journal of Drug Issues, 39*, 965–987. doi: 10.0022-0426/09/04 965-988.

Olver, M. E., Stockdale, K. C., & Wormith, J. S. (2014). Thirty years of research on the Level of Service Scales: A meta-analytic examination of predictive accuracy and sources of variability. *Psychological Assessment, 26*, 156–176. doi:10.1037/a0035080

Persson, M., Belfrage, H., Fredriksson, B., & Kristiansson, M. (2017). Violence during imprisonment, forensic psychiatric care, and probation: Correlations and predictive validity of the risk assessment instruments COVR, LSI-R, HCR-20V3, and SAPROF. *International Journal of Forensic Mental Health, 16*, 117–129. doi:10.1080/14999013.2016.1266420

Rempel, M., Green, M., & Kralstein, D. (2012). The impact of adult drug courts on crime and incarceration: findings from a multi-site quasi-experimental design. *Journal of Experimental Criminology, 8,* 165–192. doi: 10.1007/s11292-012-9143-2

Rysavy, P., Cunningham, T., & O'Reilly-Martinez, R. (2011). Preliminary analysis of the Northern Territory's illicit drug court diversion program highlights the need to examine lower program completion rates for indigenous clients. *Drug and alcohol review, 30*, 671–676. doi: 10.1111/j.1465-3362.2010.00275.x

Shaffer, D. K., Hartman, J. L., Listwan, S. J., Howell, T., & Latessa, E. J. (2011). Outcomes among drug court participants: Does drug of choice matter? *International journal of offender therapy and comparative criminology, 55*, 155–174. doi:10.1177/0306624X09359648

Somers, J. M., Rezansoff, S. N., & Moniruzzaman, A. (2014). Comparative analysis of recidivism outcomes following drug treatment court in Vancouver, Canada. *International journal of offender therapy and comparative criminology, 58*, 655–671. doi: 10.1177/0306624X13479770

Weinrath, M., & Coles, R. (2003). Third-generation prison classification: The Manitoba case. *Criminal Justice Studies, 16*, 305–316. doi: 10.1080/0888431032000183506

Wilson, D. B., Mitchell, O., & MacKenzie, D. L. (2006). A systematic review of drug court effects on recidivism. *Journal of Experimental Criminology*, *2*, 459–487. doi:10.1007/s11292-006-9019-4