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_____ **Research Report** _____

**Institutional Adjustment of Methadone
Maintenance Treatment Program
Participants**

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Institutional Adjustment of Methadone Maintenance Treatment Program Participants

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Executive Summary

Key words: *methadone maintenance treatment, opioid dependence, institutional adjustment, offender behaviour.*

Ensuring that offenders have access to interventions that will assist them in dealing with their substance abuse issues allows the Correctional Service of Canada (CSC) to support the safe reintegration of offenders into society. In order to address the treatment needs of offenders with opioid dependence, CSC introduced the Methadone Maintenance Treatment Program (MMTP) in 1998. Methadone is a long-acting, synthetic, opioid medication that helps to stabilize the lives of people who are dependent on opioids, and to reduce the harms related to their use (CAMH, 2003b), as it prevents withdrawal symptoms, reduces cravings, and blocks the euphoric effects of shorter acting opioids (CPSO, 2005).

This study examined indicators of institutional adjustment, including urinalysis results, program participation, disciplinary charges and admissions to segregation, for a retrospective cohort of male federal offenders initiated in CSC's MMTP between 2003 and 2008. Changes over time (pre and post-MMTP initiation) were examined.

Results indicated that offenders in the sample were significantly less likely to test positive or refuse to provide urine samples following MMTP initiation. In addition, the proportion of positive drug tests for opioids was significantly reduced from pre- to post-MMTP initiation (13% to 4%). Furthermore, offenders who participated in substance abuse programming and other core programming (e.g., living skills, violence prevention, sex-offender) in the two years prior to and post-MMTP were more likely to complete those programs in the post-MMTP period. MMTP initiation also had a positive impact on duration of days spent in employment and education programs. Finally, fewer MMTP participants had disciplinary charges or admissions to either voluntary or involuntary segregation in the post-MMTP time period.

This study provides information about a group of offenders that have not been extensively examined within a Canadian context. The examination of MMTP initiates' behaviour prior to and following MMTP initiation revealed positive changes over time, thereby suggesting that the MMTP has a positive impact on institutional behaviour for offenders who initiate treatment while incarcerated. Research is underway to examine the impact of the MMTP on outcomes following release from prison.

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Introduction

It is estimated that 90,000 – 125,000 Canadians have an opioid addiction (Health Canada, 2002b). In addition, estimates state that there are between 80,000 – 125,000 injection drug users in Canada, many of whom are believed to use opioids (Fischer, Firestone Cruz, & Rehm, 2006). According to results from a 2007 survey of inmate infectious diseases and risk-behaviours conducted by the Correctional Service Canada (CSC), approximately 39% of male inmates reported using illicit drugs during the previous six month period of incarceration. Of those inmates who used illicit drugs, 17% reported injecting drugs at least once. Cocaine and opioids were reported as the most commonly injected drugs. Interestingly, inmates reported more frequent cocaine injection relative to opioid injection in the six months prior to their incarceration period (in the community); however, opioids were reported as the most commonly injected drug while incarcerated (Zakaria, Thompson, Jarvis, & Borgatta, 2010).

Methadone Maintenance Treatment (MMT)

Methadone Maintenance Treatment (MMT) is a drug abuse treatment modality that has been extensively utilized and rigorously evaluated for the treatment of opioid dependence (Health Canada, 2002b). Methadone is a long-acting, synthetic, opioid medication that is identified as a safe and efficacious treatment for opioid withdrawal and dependence (Canadian Health Network [CHN], 2006; Centre for Addiction and Mental Health [CAMH], 2003a; Office of National Drug Control Policy [ONDCP], 2000). The pharmacological properties of methadone (i.e., longer acting than other opioids) allow for once daily administration to manage withdrawal symptoms and cravings. In addition, methadone is an opioid-blocker, and eliminates the effects of other shorter-term opioids such as heroin and morphine if ingested during methadone treatment (College of Physicians and Surgeons of Ontario [CPSO], 2005).

Methadone helps to stabilize the lives of people who are dependent on opioids, and to reduce the harm related to opioid use (CAMH, 2003b), as it prevents withdrawal symptoms, reduces cravings, and blocks the euphoric effects of shorter acting opioids (CPSO, 2005). Instead of experiencing a constant cycle of highs and lows, opioid-dependent individuals on methadone will receive a break from the constant stress of supplying an insatiable craving, and will experience mood stability and an improved level of functioning. As reported in the Health Canada document *Best Practices* (2002a), research indicates that, on average, individuals

receiving MMT will: spend less time using narcotics on a day-to-day basis; reduce their use of illicitly obtained opioids; reduce their use of other substances; spend less time dealing drugs; spend less time involved in criminal activities; spend less time incarcerated; have much lower death rates than individuals not receiving treatment; reduce injection drug use behaviour; reduce the risk of acquiring HIV/AIDS, Hepatitis C or other blood-borne pathogens; improve their physical and mental health; improve their social functioning and likelihood for full-time employment; and improve their overall quality of life (pp. 16-17). As a result of the effectiveness of MMT in reducing drug use, transmission of blood-borne diseases, and criminal activity, methadone positively benefits society by decreasing criminal activity and improving public health (Connock et al., 2007; Health Canada, 2002a, 2002b; Marsch, 1998; Mattick, Breen, Kimber, & Davoli, 2009; Ward, Hall, & Mattick, 1999).

CSC's Policy on MMT

Within CSC federal facilities, offenders with opioid addictions are able to access the Methadone Maintenance Treatment Program (MMTP) in order to deal with their addiction. In 1998, the CSC introduced Phase 1 of the MMTP to address the needs of only those opioid-dependent offenders that were maintained on methadone prior to their admission to federal custody and those meeting the exceptional circumstances criteria.¹ With the introduction of Phase 2 in 2002 the program evolved to include all offenders who met the following criteria:

1. A diagnosis of dependence to opioids, as established in the Diagnostic Statistical Manual (DSM-IV), where the route of choice is intravenous or a well-documented history of opioid addiction indicating a high risk of relapse, as confirmed by a certified institutional physician; and
2. A past history of treatment failures and evidence of a small likelihood of benefit from non-methadone treatment; and
3. A formal agreement by the offender to the terms and conditions of Methadone Maintenance Treatment.

In December 2008, the CSC introduced the guidelines for the Opioid Substitution

¹ Exceptional circumstances: where all available treatments and programs have failed, the health of the offender continues to be seriously compromised by addictions, and there is a dire need for immediate supervision.

Therapy Program (OSTP) which enhances the former MMTP.² This program includes offering Methadone or Suboxone®³ to offenders meeting the criteria specified in the guidelines (Correctional Service Canada, 2008). The objectives of the CSC's OSTP are consistent with those of other jurisdictions. They include decreasing the rate of injection drug use; reducing relapse to opioid drug use and the incidence of drug-related criminal activity; improving the offender's general health and quality of life; reducing the transmission of HIV and other blood-borne pathogens and assisting and motivating offenders to gradually desist from all illicit drug use (Correctional Service Canada, 2008).⁴

MMT in Correctional Settings

Methadone Maintenance Treatment (MMT) has been used in a variety of correctional jurisdictions since the early 1970's such as New York, Baltimore, Puerto Rico; the State of New South Wales, and in the federal correctional system in Canada (Cropsey, Villalobos, & St. Clair, 2005; Darke, Kaye, & Finlay-Jones, 1998; Dolan, Wodak, & Hall, 1998; Heimer et al., 2006; Johnson, van de Ven, & Grant, 2001; Magura, Rosenblum, Lewis, & Joseph, 1993). A recent report by Johnson, Farrell MacDonald and Cheverie (2011) provides an overview of characteristics of MMTP participants in the Canadian federal correctional system during 2003-2008. Compared to the general institutional population, the MMTP participants had greater needs, were considered a higher risk population, and had more extensive criminal histories. Overall, the profile of MMTP participants suggested a complex group of inmates who require more services and resources in order to facilitate reintegration into the community.

Although empirical evidence examining the characteristics of institutional MMTP participants and the impact of MMTP participation on post-release outcomes such as continuation of MMT in the community and rates of re-offending exist, there is a paucity of research examining the impact of MMT on behaviours while incarcerated. In a study conducted with a prison population in New South Wales, Dolan and colleagues (1998) found that

² In 2008, the CSC revised its former Methadone Maintenance Therapy Program to the Opioid Substitution Therapy Program in order to include both Methadone and Suboxone® as treatment options. The former program may be referred to throughout this document since only those initiated on Methadone were included in this study.

³ Suboxone ® is a combination medication made up of Buprenorphine and Naloxone. The intention of the Naloxone component is to deter intravenous misuse. Suboxone ® is a sublingual medication (dissolved under the tongue) indicated for treatment of opioid dependence in adults. Suboxone ® is taken daily, initially, and then dosing can be every other day or more depending on the individual and the physician (Correctional Service Canada, 2008)

⁴ See Correctional Service Canada. (2008). *Specific guidelines for the treatment of opiate dependence (Methadone /Suboxone®)*. Ottawa, ON: Correctional Service Canada for a complete description of CSC's MMTP.

participants who had been maintained on methadone reported a significantly lower prevalence of heroin injection, syringe sharing, and scored lower on an HIV Risk-Taking Behavioural Scale than participants who received standard drug treatment (counselling) and time-limited methadone treatment. In subsequent research, a randomized control design was used to compare 129 inmates in MMT to 124 inmates in a MMT waitlist control group on heroin use, syringe sharing, HIV and hepatitis C incidence. After the 5 month follow-up period, MMT-treated inmates demonstrated lower levels of heroin use, injection drug use and syringe sharing compared to inmates in the waitlist control group (Dolan et al., 2003). In addition, a four year follow-up study of the same inmates to determine mortality, re-incarceration and hepatitis C infection was conducted. In this study, retention in MMT was associated with a lower level of mortality, reduced incarceration rates and reduced hepatitis C infection rates (Dolan et al., 2005).

Fewer studies still have examined the impact of MMT on behaviours related to the management of inmates such as institutional incidents and charges and participation in institutional programming. Johnson and colleagues (2001) compared 303 offenders identified as having participated in the MMTP in a Canadian federal institution from November 1996 to October 1999 (MMT group) with a group of offenders who were identified as having a drug addiction and who had at least one positive urinalysis result for opiates or opiates A (heroin metabolites) in random and systematic testing from January 1998 to October 1999 (Non-MMT group).⁵ In terms of institutional behaviour, the MMT and non-MMT groups were examined over time (six months prior to and six months after the MMT start date or six months prior to and six months after a positive urinalysis result for opiates for the non-MMT group) on measures such as the number and type of institutional charges and time spent in segregation. Overall, the MMT group had a lower rate of serious drug related charges compared to the non-MMT group. Furthermore, MMTP participants demonstrated a reduced rate of serious drug related charges following the initiation into the MMTP, while the rate of serious drug related charges increased over time among the non-MMTP group.

Qualitative studies have found that methadone maintenance can have a positive impact on overall prison management (Carlin, 2005; Luyt, 2007; Magura et al, 1993). In a recent review of harm reduction, substance abuse and methadone maintenance in Scottish prisons, prison

⁵ This study was conducted prior to the introduction of Phase 2 of the MMTP and therefore only included offenders who were continuing methadone treatment that was started in the community, as well as those offenders who met the exceptional circumstances criteria (e.g., where all available treatments and programs have failed, the health of the offender continues to be seriously compromised by addiction, and there is a dire need for immediate intervention).

managers discussed the contribution of methadone maintenance to effective prison management (Luyt, 2007). The Scottish prison managers reported calmer atmospheres and reductions in the incidence of violence after the introduction of methadone maintenance in the prison system. Inmates on methadone also reported an increase in participation in rehabilitation and work programs. The availability of methadone also appeared to have a positive impact on drug debts that inmates incurred while they were serving their sentences. However, throughout the Scottish prison system, controversy remains as to whether or not inmates on methadone significantly decrease their use of other drugs.

Similar themes were reported in an exploratory qualitative study of prisoners' and prison staff's perception of the MMT program in a prison in Ireland (Carlin, 2005). Both the prisoners and the prison staff defined methadone as serving a number of functions, such as: 1) ensuring the continuity of treatment from the community; 2) reducing the drug supply within the prison; 3) reducing risky health behaviours such as needle sharing; 4) responding to opioid addiction; and 5) maintaining order and control within the prison. In general, prison staff found that those inmates on methadone were generally "calmer and less edgy and tense" (Carlin, 2005, p. 411). Staff also mentioned that inmates on methadone do not have the same pressure from other inmates to obtain drugs. Both prisoners and prison staff shared the opinion that one of the main purposes of the methadone maintenance program was to "control drug-addicted prisoners and to maintain order in the prison" (Carlin, 2005, p. 414).

Institutional Adjustment

Institutional adjustment has been conceptualized as a measure of coping or an ability to adapt to prison life. Understanding how inmates cope with prison life is an important component of providing a safe environment where rehabilitation can be achieved. Although no gold-standard for measuring institutional adjustment exists, the main measure used to indicate institutional adjustment has been disciplinary infractions while incarcerated (Casey Acevedo & Bakken, 2004; Gendreau, Goggin, & Law, 1997). In addition, research has indicated that factors such as participation in programming, maintaining contact with families, having motivation to change, and following prison rules, thereby minimizing disciplinary incidents, has an impact on an inmate's ability to adapt to prison life (Dhami, Ayton, & Loewenstein, 2007; Jiang & Winfree, 2006; Van Tongeren & Klebe, 2010; Welsh, 2010). Additionally, time spent in solitary confinement or segregation has been associated with maladjustment in prison (Harrington & Ogle, 2008). Van Tongeren and Klebe (2010) contend that adjustment in prison is a

multidimensional construct and includes the dimensions of 1) environmental adjustment; 2) societal rehabilitation; and 3) criminality reduction. A similar approach to measuring adaptations to imprisonment was employed by Dhimi and colleagues (2007) and included five categories: 1) regime – participating in programming; 2) contact – frequency of contact with other inmates and family or friends; 3) thoughts – frequency of thoughts about missing freedom; 4) emotions – degree of happiness and hopelessness; 5) misconduct – number of disciplinary incidents. The CSC includes five factors as proxy measures of institutional adjustment. These institutional adjustment factors are assessed during reviews of offenders’ security classification and include: violent incidents, disciplinary convictions, continuation of criminal activities, administrative interventions, and behaviour and program participation (CSC, 2010).

Purpose and Rationale

This report is the second in a series of reports that are being produced by the Addictions Research Centre that examines information related to the institutional MMTP within CSC. Effective prison management is of particular importance to the successful operation of CSC institutions; however, few studies have examined the influence that MMTP participation has on inmate behaviour and the adjustment of inmates to prison life. The purpose of this report is to examine the impact that the MMTP has on institutional adjustment on the male participants in the MMTP between 2003 and 2008.⁶ This report aims to answer the following question: Does MMTP participation have a positive impact on measures of institutional adjustment and behaviour, specifically random urinalysis program results, correctional program participation and completion, disciplinary charges, and admissions to segregation?

⁶ A subsequent report will examine post-release outcomes for men and women MMTP participants. A recent report examined characteristics of male MMTP participants who participated in the MMTP between 2003 and 2008 in comparison to the general inmate population (Johnson et al., 2011). In addition, the characteristics of women MMTP participants were examined in a separate report (MacSwain, Cheverie, Farrell MacDonald, & Johnson, under review). Only those in the MMTP are included in this study since Suboxone was not available as an option during data collection.

Method

Sample and Approach

The retrospective cohort consists of male federal offenders who were initiated into the MMTP between January 1, 2003 and December 31, 2008.⁷ Potential participants were identified based on a triangulation of several data sources including the presence of one or more of the following three criteria: 1) if the offender's file had a methadone flag in the Offender Management System (OMS) and/or 2) if the offender had at least one of two MMTP initiation documents in the Addictions Research Centre's MMTP Research Databases and/or 3) if the offender had indicated past and continuing MMTP participation at intake, through the Computerized Assessment of Substance Abuse (CASA) database.⁸ MMTP participation was further verified by conducting an in depth file review using documents stored in the OMS for offenders only identified with a methadone flag, or through the CASA.

In order to observe potential changes in institutional behaviour in the sample of MMTP initiates, a pre-post-MMTP initiation design was used. Exploratory analyses were conducted to determine the most appropriate timeframe to use for the pre and post periods for each measure of institutional adjustment.

Data Sources

The two main sources of data for this report were the Offender Management System (OMS) and MMTP administrative documentation.

The OMS is an electronic administrative and operational database used by CSC to maintain all offender records from sentence commencement to sentence end. The system includes information such as: demographics, sentence and conviction information, admission and release records, urinalysis results, disciplinary charge information, reports on offender performance during incarceration and while in the community, correctional program participation, specific alerts and flags, Offender Intake Assessment (OIA) information including static and dynamic risk and need assessments, substance abuse assessments, and supplementary

⁷ This sample does not include offenders who were identified as entering CSC's MMTP between 2003 and 2008, but who were initiated in the community and continuing MMTP upon incarceration (N = 557).

⁸ The Computerized Assessment of Substance Abuse (CASA) is a tool used by CSC to assess substance abuse problems. It is administered at intake to offenders where there is an indication of a substance abuse problem linked to their criminal behaviour. The CASA includes standardized measures to determine the severity of substance abuse including the Drug Abuse Screening Test (DAST) and the Alcohol Dependence Scale (ADS).

assessment information and related records.

Although there is a wealth of offender-related information within the OMS, it does not contain methadone specific information; therefore, in 2004, the Addictions Research Centre (ARC) of CSC, in partnership with the Health Services Branch of CSC, agreed to collect, manage, and analyze current and archived CSC MMTP administrative information for research purposes. Research databases were created to manage methadone administrative records received from operational sites. Specifically, two initiation documents, the Substance Abuse Assessment Questionnaire (SAAQ) and the Medical Assessment for Methadone Initiation (MAMI), were used to identify participants. Datasets from these two sources were merged together to create one dataset that contained all relevant information. To view copies of the MAMI and SAAQ, please refer to Johnson et al. (2011).

Measures

In order to provide an overview of the study participants, general characteristics such as age at admission, marital status, aboriginal ancestry, criminal history, substance abuse severity levels,⁹ motivation level, reintegration potential, and criminogenic risk and need ratings were extracted from OMS.

The variables of criminogenic risk and need were based on results from the Offender Intake Assessment. The Offender Intake Assessment (OIA) process begins immediately after an offender is sentenced.¹⁰ It incorporates a variety of information sources and assessments and is an important correctional planning tool. Specifically, the OIA involves the systematic identification and analysis of critical factors that affect the safe and timely reintegration of each offender into the community (CSC, 2007a). The assessment of static factors (criminogenic risk) includes historical factors such as criminal history, offence severity, and sex offence history. Offenders are assigned an overall static or 'risk' level of 'low', 'moderate', or 'high' based on the results of the static factor analysis. The dynamic factors assessment (criminogenic need)

⁹ As measured by the Alcohol Dependence Scale (ADS; Skinner & Horn, 1984) and the Drug Abuse Screening Test (DAST; Skinner, 1982).

¹⁰ As of September 2009, the Compressed Offender Intake Assessment (COIA) was implemented. The COIA applies to offenders serving four years or less for non-violent crimes with limited or no criminal history who do not require psychological assessment or detention referral and who do not have a Long Term Supervision Order. However, this revision to the OIA does not impact the OIA data of offenders in this study given it was implemented after the end of the data collection period (December 31, 2008). In addition, the former OIA contained 197 indicators to determine criminogenic need, but as of September 2009, the number of indicators examined was reduced to 100.

specifically considers needs in seven domains: employment, marital/family, associates, substance abuse, community functioning, personal/emotional orientation, and attitude. Offenders are rated on a four-point scale for each domain¹¹ (factor rated as an asset to community adjustment, no immediate need for improvement, some need for improvement, considerable need for improvement) and are also assigned an overall dynamic factor need rating of ‘low’, ‘moderate’, or ‘high’ based on the number of domains identified and the severity of contributing dynamic risk factors (Brown & Motiuk, 2005).

Motivation level provides an indication of the offender’s readiness and willingness to participate in programming and interventions to address their criminogenic needs, availability of external support, and past history related to demonstrating change. This OIA variable is also measured on a three-point scale with ‘low’ indicating no recognition by the offender that they have a need; ‘moderate’, the offender may not fully recognize the need area but is willing to participate in recommended programs; and ‘high’, where these offenders are ready to engage in programming and fully recognize their need (CSC, 2007b).

Reintegration potential is a rating used to assess the risk presented to the community by an offender and is based on the offender’s security classification (Custody Rating Scale or CRS rating; CSC, 2007c), static factor rating of the OIA, and Revised Statistical Information on Recidivism Scale (SIR-R) scale score for non-Aboriginal men. The SIR-R, used during the OIA process, is a validated tool for predicting the risk of re-offending among federally sentenced non-aboriginal men during the first three years after release from federal custody (Nafekh & Motiuk, 2002).¹² The 15-item scale, which assesses demographic and criminal history characteristics, is used to classify offenders into one of five possible risk categories: ‘very good’ risk (four out of five offenders predicted to succeed on release); ‘good’ risk (two out of three offenders in this category predicted to succeed); ‘fair’ risk (one out of two offenders predicted to succeed); ‘fair/poor’ risk (two out of five offenders predicted to succeed); and ‘poor’ risk (one out of three offenders predicted to succeed). The reintegration potential rating for women and all Aboriginal offenders is based on the CRS rating, the static factor rating of the OIA, and the dynamic factor rating of the OIA. Offenders are assigned a level of ‘low’, ‘moderate’, and ‘high’ in this area.

¹¹ The substance abuse and the personal/emotional orientation domains are rated on a three-point scale ranging from ‘no need for improvement’ to ‘considerable need for improvement’ (these domains cannot be rated as ‘factor seen as an asset to community adjustment’).

¹² This scale has not been validated for women or Aboriginal persons and is therefore unavailable for these groups.

Outcome measures

The outcome variable of institutional adjustment was examined using a variety of indicators including random urinalysis program results; correctional program participation; disciplinary charges; and admissions to segregation. It should be noted that the timeframes to examine institutional adjustment pre- and post-MMTP initiation differed depending on the indicator. Disciplinary charges and segregation data were examined for 1 year pre- and post-MMTP initiation. Correctional programs and random urinalysis testing were examined for 2 years pre- and post-MMTP initiation. Offenders who had less than the maximum time period examined (1 or 2 years depending on the indicator) either prior to or post-MMTP initiation were still retained in the analysis as all indicators were adjusted for time at risk. The rationale for differing follow-up periods was determined through initial exploratory analyses regarding the availability of data for each measure. The indicators used are described in detail, below.

Random urinalysis program test results

CSC randomly selects 5% of offenders per month to participate in the random urinalysis program. The number of positive urinalysis test results was examined using two methods: 1) the proportion of positive tests compared to all tests requested (i.e., all test requests including tests taken, and test refusals) and 2) the proportion of positive tests compared to all tests where urine samples were provided (i.e., excluding test refusals; adjusted positive tests). The proportion of offenders who refused to provide a sample was also examined. In addition, we examined the combined proportion of positive and refused tests, as these are comparable offences that are punishable by the same types of sanctions based on Sections 38-44 of the Corrections and Conditional Release Act (CCRA). In addition, refusal to provide a sample may suggest an offender has been using drugs, although this is not always necessarily the case. Finally, the types of drugs found for positive samples were explored. Positive test results for prescribed drugs, including methadone, were excluded from the analysis.

Correctional program participation

Four general categories of programs were examined in this report: substance abuse programs, institutional employment programs (including CORCAN), education programs, and other core correctional programs (living skills, sex offender, and violence/family violence prevention programs). For substance abuse and other core programs, instances where the offender successfully completed or attended all sessions were coded as completing a program. Non-completion due to offender related reasons such as suspension from program, withdrawn

from program and program incompleteness were also examined. Offenders who were deemed non-completers due to administrative reasons were removed from the analyses.¹³ For employment programs, the number of days spent in this type of programming per offender year of incarceration was examined. For education programs, the number of days spent in education programs per offender year of incarceration was examined for all offenders who were referred to an education program.¹⁴

Disciplinary charges

The number of minor and serious disciplinary charges that inmates incurred as a result of a disciplinary offence was examined, in addition to the proportion of offenders who received minor and serious disciplinary charges. For the purpose of this report, only disciplinary charges for which offenders were found guilty were included in the analyses.

Segregation

Admissions to two types of segregation – involuntary and voluntary segregation – were examined.¹⁵ Voluntary segregation is requested by an inmate, and is granted when there are reasonable grounds to believe that the continued presence of the inmate in the general population would jeopardize the inmate's own safety. Involuntary segregation is imposed when the continued presence of the inmate in the general inmate population would 1) jeopardize the inmate's own safety, or the safety of any person; 2) jeopardize the security of the institution; or 3) interfere with an ongoing investigation.

The four institutional adjustment outcomes were examined pre-MMTP and post-MMTP initiation for those offenders who started the MMTP during their incarceration. Six month intervals up to a period of one year were examined pre-MMTP and post-MMTP initiation for disciplinary charges and segregation, while a period of up to two years prior to MMTP initiation and post-MMTP initiation was used for correctional program participation and random urinalysis results.

¹³ Examples of administrative reasons for program non-completion are assignment cancelled, program cancelled, paroled, transferred, released, and wed reached.

¹⁴ Participation in employment and education programs was examined using days in treatment as opposed to assignment status in OMS to account for the differences in the overall program delivery. Employment and education programs are generally long in duration and often offenders will be transferred while they are participating in an employment or education program, thus receiving an incomplete assignment status. The decision to count days spent in programs over the total time incarcerated allowed offenders to receive credit for the time they spent engaged in these programs, regardless of operational situations that are often beyond their control.

¹⁵ The third type of segregation, disciplinary segregation, is a type of sanction that may be imposed for a serious disciplinary offence. There was not enough data to examine this type of segregation.

Statistical Analyses

All data management, data transformations and statistical analyses were performed using SAS[®] software, Version 9.2 (SAS Institute Inc, 2007) or Stata (release 10; StataCorp, College Station, TX, USA). Characteristics of the sample were examined using frequency distributions tabulations for the categorical variables and means and standard deviations for the continuous variables.

Incidence rate ratios per offender year incarcerated were calculated for serious and minor disciplinary charges, as well as admissions to voluntary and involuntary segregation in 6 month time intervals, spanning one year prior to MMTP initiation, to one year following MMTP initiation.¹⁶ In addition, the proportion of MMTP participants who received disciplinary charges and admissions to segregation was examined using Pearson's Chi-Square. Incidence rate ratios were also calculated to examine the number of days spent in education (for those referred to education programs) and employment programs per offender year incarcerated for the two years prior to and following MMTP initiation. Incident rate ratios were computed by comparing the incident rate¹⁷ in the pre-MMTP period compared to the post-MMTP period. An incident rate ratio ranges from 0 to infinity, with a value of 1 indicating no relationship. Values less than 1 indicate that the occurrence is less likely in the pre-MMTP period while values greater than 1 indicate that the occurrence is more likely in the post-MMTP period. Completion of substance abuse and other core programs was examined using Pearson's Chi-Square. Proportions of positive and refused urinalysis tests in the two year pre and post-MMTP initiation periods were examined using Pearson's Chi-Square for offenders with urinalysis tests in either the pre- or post-period, and McNemar's test for those with tests in both the pre- and post-periods.

¹⁶ For the segregation analyses offender years incarcerated was adjusted to exclude days spent in voluntary, involuntary, and disciplinary segregation, as offenders are not at risk to be admitted to segregation, while they are already in segregation.

¹⁷ An incident rate is calculated by comparing the total number of events that occur in the time period divided by the total number of time within which the participants could potentially experience the event.

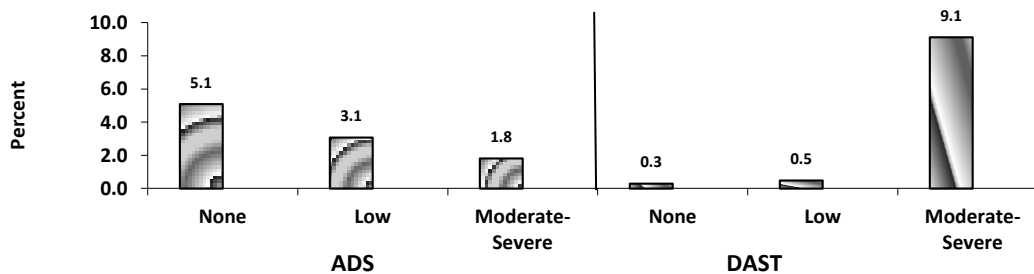
Results

Sample Characteristics

During the study period, 1,508 offenders were initiated in the MMTP in a federal institution. The average age of offenders was 33.2 years (SD 8.2), while 15.5% of the sample was of Aboriginal ancestry. Marital status was examined with 52.0% reporting being single, 38.9% reporting being currently married/common-law, and 9.1% reporting being previously married.¹⁸ Sentence information including sentence length and sentence number was also examined. Almost half of the sample (42.0%) was serving a first federal sentence, 31.8% were serving a second sentence, and 26.3% were serving their third or higher sentence. Sentence length was examined categorically with 47.4% serving a sentence between two and four years, 16.3% serving a four to six year sentence, 8.2% serving a sentence between six and eight years and 28.2% serving a sentence over eight years.

Severity level of drug and alcohol abuse problems are indicated in Figure 1, with approximately half (49.0%) of offenders assessed as having an alcohol dependence problem and over 90.0% as having a drug abuse problem.^{19, 20}

Figure 1. Severity of Substance Abuse Problems as Measured by the ADS and the DAST



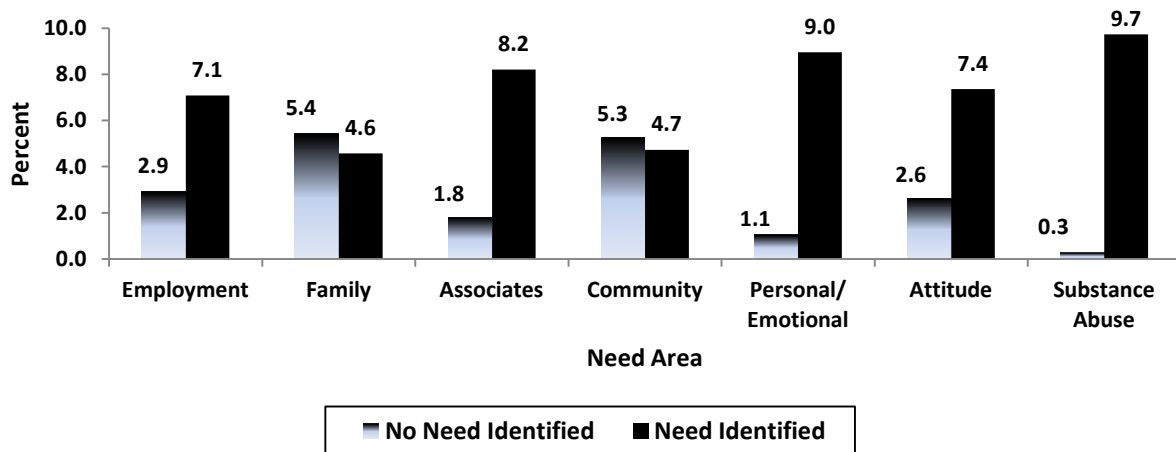
¹⁸ Marital status was unknown for 4 offenders.

¹⁹ For an examination of the opioid and poly-drug use patterns of male MMTP participants, please refer to Johnson et al., 2011.

²⁰ MMT participants must be opioid dependent to receive treatment. Analyses of male participants of the MMTP who were rated none or low on the DAST at intake revealed several explanations as to why, at the time of assessment, they were not found to have a drug problem, including offenders entering CSC already on methadone (and therefore not using drugs at the time of assessment), offenders whose opioid problem stemmed from a legitimate prescription, and therefore was not recognized as a problem initially, and offenders who began using opioids while they were incarcerated. Some offenders denied drug use at intake, but later admitted to heavy use.

Criminogenic need areas are measured during the offender intake assessment process. Figure 2 displays the seven criminogenic need areas based on those who were identified as having no need and those who were identified as having some or considerable need. The three main areas of need for this sample were substance abuse (97.3%), personal/emotional orientation (89.5%) and associates (82.0%).

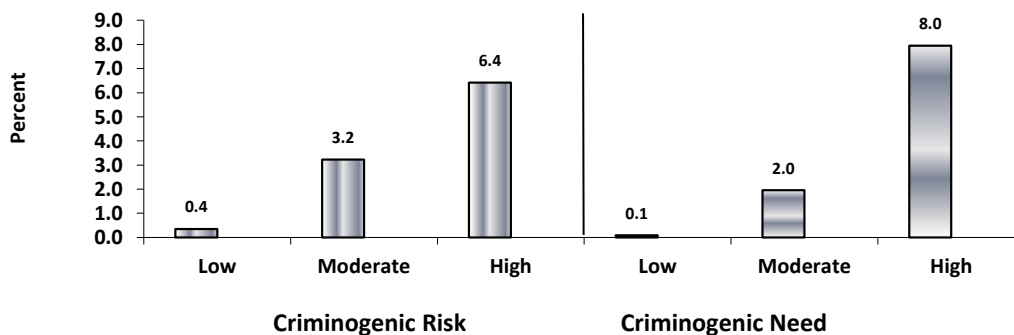
Figure 2. Percentage of Offenders Identified as Having Some/Considerable Need in Criminogenic Need Areas



Note. Missing values: 18 offenders did not have information for the seven criminogenic need areas.

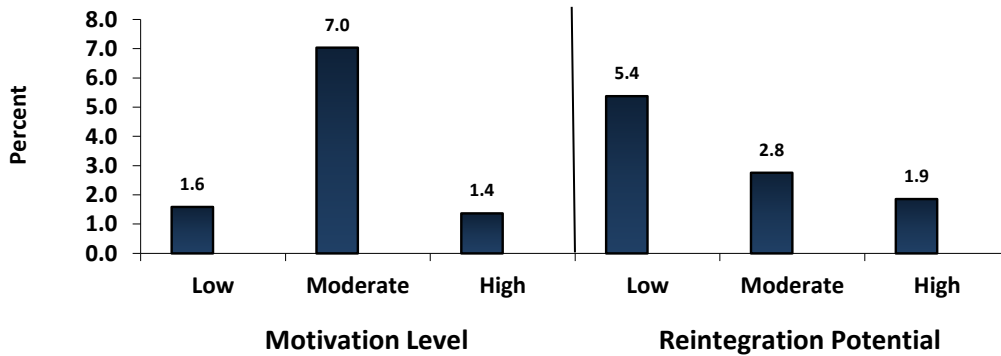
Ratings on several additional criminogenic variables are presented in Figure 3 and Figure 4. In general, MMTP participants in this sample were rated with high levels of criminogenic risk and need with 96.5% of the sample having a moderate or high level of risk and 99.1% rated with a moderate or high need level. A large proportion of this sample had low or moderate levels of motivation (86.3%) and low or moderate reintegration potential (81.4%).

Figure 3. Criminogenic Risk and Criminogenic Need Scores



Note. Missing Values: 18 offenders did not have data for risk or need.

Figure 4. Motivation Level and Reintegration Potential Scores



Note. Missing Values: motivation level – 440 offenders; reintegration potential – 440 offenders.

Current and previous offence information was examined for the sample. The mean number of offences committed for their current sentence was 8.6 (SD = 11.1). In addition, over half the sample (58.0%) had served a previous federal sentence. Among these offenders, the average number of previous offences committed was 14.8 (SD = 14.6). Current and previous offence types were also examined and are presented in Table 1.

Table 1

Percentage of Offenders who Committed One or More Offences for their Current and Previous Sentences, by Offence Type

Offence Type	Current Offences		Previous Offences	
	%	(n)	%	(n)
Homicide	8.1	(122)	1.9	(28)
Sex-related	2.6	(39)	1.9	(29)
Drug-related	18.6	(280)	17.8	(269)
Assault	23.6	(356)	19.8	(299)
Robbery	48.7	(735)	25.3	(381)
Theft/Break & Enter	51.0	(769)	42.9	(647)
Fraud/Forgery	8.6	(130)	8.2	(124)
Weapon offences	18.6	(280)	13.9	(210)
Kidnapping	5.0	(75)	2.3	(35)
Escape	9.0	(135)	14.7	(222)
Arson/Uttering Threats	8.1	(122)	6.3	(95)
Non-violent Crimes ^a	65.3	(984)	47.2	(711)

^a. Non-violent crimes include: breach of recognizance, contempt of court, fail to comply, mischief, motor vehicle related offences, obstruct justice, violation of provincial statutes, solicitation, trespassing.

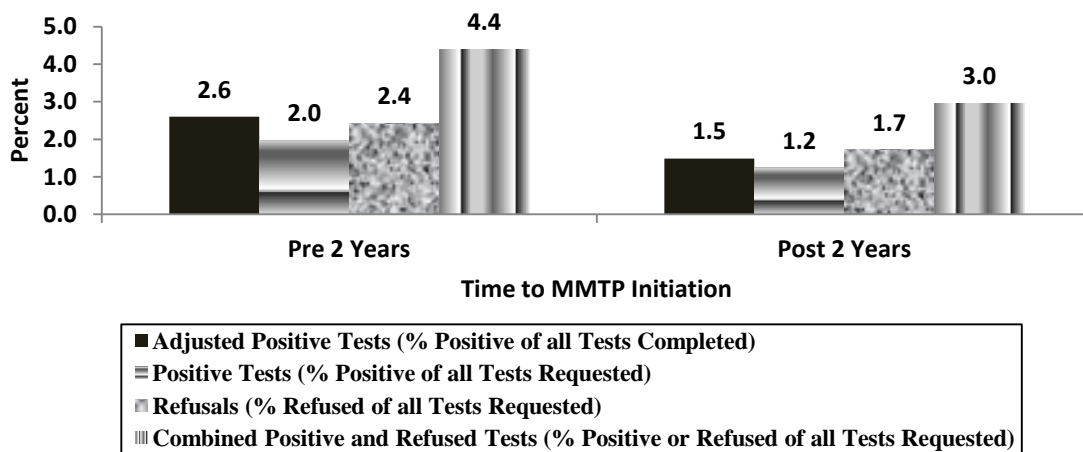
Institutional Adjustment Outcomes

1. Random urinalysis program

Positive tests and test refusals

In the two years prior to and following their initiation on methadone, 653 (43.3%) and 610 (40.5%) offenders in the MMTP initiation group received at least one urinalysis test, respectively, with a total of 985 tests in the pre-MMTP period, and 906 tests in the post period. One quarter (26.4%; $n = 398$) of offenders received urinalysis testing in the two year pre-MMTP period only, 23.5% ($n = 355$) received urinalysis testing in the post-MMTP period only, and 16.9% ($n = 255$) received urinalysis testing in both the pre and post-MMTP periods. Overall, as shown in Figure 5, there was a decrease in both the number of positive test results, as well as test refusals from the pre two year to the post two year period.

Figure 5. Percentage of Positive Urinalysis Tests and Test Refusals Two Years Pre and Post-MMTP Initiation²¹



To examine the significance of this finding, offenders who received a urinalysis test either in the pre or post time periods were compared separately from those who received a test in both time periods to ensure independence of observations. Among those who were tested in either the pre or post-MMTP period, offenders had a higher percentage of adjusted positive tests, positive tests, refusals, and combined positives and refusals in the pre period compared to those who received testing in the post period (adjusted positives: 26.3% vs. 17.0%, $\chi^2(1, n = 635) = 8.12$, $p = 0.0044$, $v = -0.11$; positives: 21.4% vs. 14.9%, $\chi^2(1, n = 753) = 5.18$, $p = 0.0229$, $v = -$

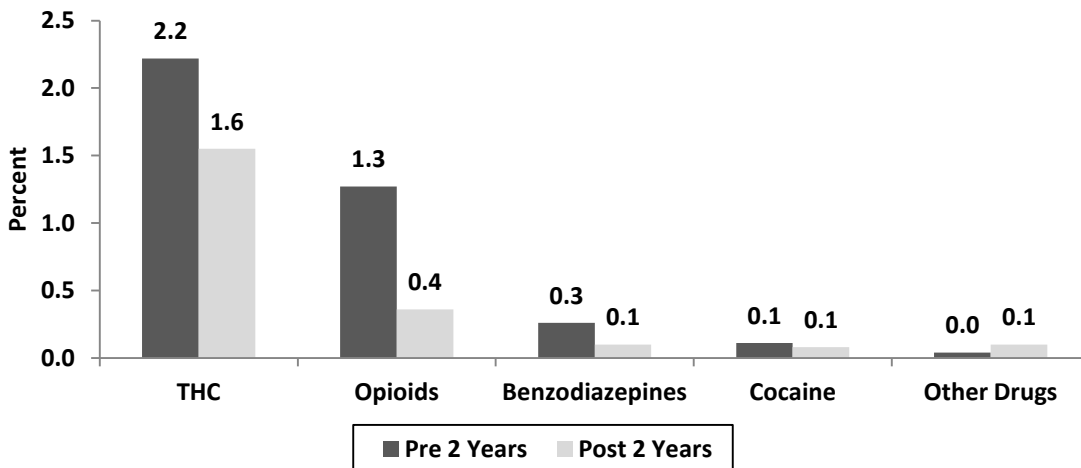
²¹ As offenders may not always complete a requested urinalysis test, an adjusted percentage of positive test results was included to account for the difference between the number of tests that were actually completed compared to the positive test category which examines all the tests that were requested.

0.08; refusals: 28.6% vs. 22.3%, $\chi^2(1, n = 753) = 4.02, p = 0.0450, v = -0.07$; and combined: 46.7% vs. 34.9%, $\chi^2(1, n = 735) = 10.79, p = 0.0010, v = -0.12$). Similarly, among offenders who received at least one urinalysis test in both the pre and post time periods, a significant reduction in adjusted positive tests (27.8% vs. 17.6%), positives (26.7% vs. 16.9%), refusals (29.0% vs. 21.2%) and combined positives and refusals (49.8% vs. 35.7%) was observed following MMTP initiation (adjusted positives: $\chi^2(1, n = 245) = 7.18, p = 0.0074$; positives: $\chi^2(1, n = 255) = 7.18, p = 0.0074$; refusals: $\chi^2(1, n = 255) = 4.76, p = 0.0291$; combined: $\chi^2(1, n = 255) = 12.00, p = 0.0005$).

Drug types found

The types of drugs found during each time period were also examined. During the two year period prior to MMTP initiation, there were a total of 153 positive tests based on random urinalysis test results. In the two years following MMTP initiation, a total of 96 positive tests were returned. Figure 6 presents the percentage of adjusted positive tests by drug type. A decrease in positive results for almost every type of drug was observed in the post-MMTP time period compared to the two years prior to initiation. The most commonly found drug in both time periods was THC [22.2% ($n = 103$) of all tests taken pre initiation and 15.5% ($n = 74$) post initiation]. The number of positive opioid results reduced dramatically from 12.7% ($n = 59$) in the two years prior to MMTP initiation, to 3.6% ($n = 17$) in the two years following MMTP initiation. There was also a reduction in the number of positive benzodiazepine and cocaine results, although an increase was seen in the number of ‘other’ positive test results.

Figure 6. Percentage of Positive Tests by Drugs Found for all Urinalysis Tests Taken in the Two Years Pre and Post-MMTP Initiation



2. Correctional program participation

Substance abuse programs

Over one quarter (26.1%; $n = 393$) of offenders who initiated the MMTP within a federal institution participated in at least one substance abuse program in the two years prior to MMTP initiation, and 21.3% ($n = 321$) took at least one substance abuse program in the two years following MMTP initiation, with a total of 421 program attempts in the pre-MMTP period, and 348 program attempts in the post-MMTP period. Overall, not including unsuccessful program attempts due to administrative reasons such as being transferred, or a program being cancelled (18 attempts in the pre period and 10 attempts in the post period), 76.7% ($n = 309$) of program attempts were completed in the two year pre-MMTP initiation period, compared to 73.1% (247) in the post two year period. Offenders who did not complete a program due to administrative reasons, such as being transferred, or the program being cancelled, were not included in the analysis.

To examine the significance of this finding, offenders who participated in at least one substance abuse program in either the pre ($n = 356$) or post ($n = 285$) period were compared based on any completion of a substance abuse program (excluding offenders who did not complete all program attempts due to administrative reasons, $n = 19$). The proportion of offenders who completed a substance abuse program did not differ significantly in the pre (83.4%, $n = 297$) and post (79.7%, $n = 227$) time periods, $\chi^2(1, n = 641) = 1.51, p = 0.22$.

The remaining 28 offenders who received at least one substance abuse program in both the pre and post-MMTP initiation time periods were also examined separately. The proportion of completed program attempts more than doubled, from 29.2% in the pre two year period, to 63.3% in the post two year period.

Other core programs

Just under one quarter (24.7 %; $n = 372$) of MMTP initiates took at least one other core program in the two years preceding MMTP initiation, while 15.7% ($n = 237$) took at least one other core program in the two years following MMTP initiation, with a total of 503 program attempts in the pre-MMTP period and 281 program attempts in the post-MMTP period. Overall, not including unsuccessful program attempts due to administrative reasons such as being transferred, or a program being cancelled (47 attempts in the pre period and 12 attempts in the post period), 69.5% ($n = 317$) of program attempts were completed in the two years prior to MMTP initiation, compared to 75.1% ($n = 202$) in the two years following MMTP initiation.

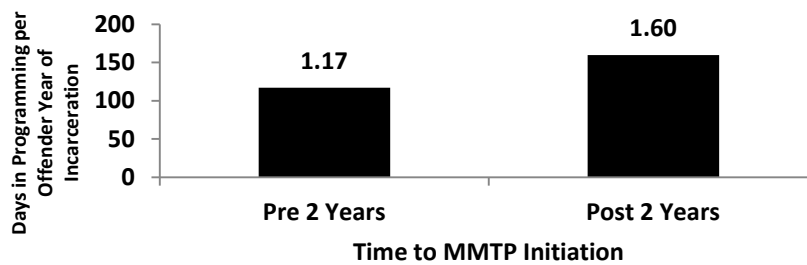
To examine the significance of this finding, offenders who participated in at least one other core program in either the pre ($n = 288$) or post ($n = 166$) period were compared based on any completion of a program (excluding offenders who did not complete all program attempts due to administrative reasons, $n = 23$). The proportion of offenders who completed other core programs did not differ significantly in the pre (78.1%, $n = 225$) and post (76.5%, $n = 127$) time periods, $\chi^2(1, n = 454) = 0.16, p = 0.69$.

The remaining 66 offenders who received at least one other core program in both the pre and post-MMTP initiation time periods were also examined separately. The proportion of completed program attempts increased from 62.5% in the pre two year period, to 79.5% in the post two year period.

Employment programs

In the two years prior to MMTP initiation, 67.2% ($n = 1,013$) of MMTP initiates participated in an employment program, compared to 63.1% ($n = 951$) in the two years following MMTP initiation. Incidence rates were calculated to examine the number of days offenders spent in employment programs per offender year of incarceration and are presented in Figure 7. It was found that offenders spent significantly more time in employment programs in the two years following MMTP initiation compared to the two years prior (IR = 1.36, 95% CI 1.36-1.37).

Figure 7. Incidence Rates of Days Spent in Employment Programs per Offender Year of Incarceration

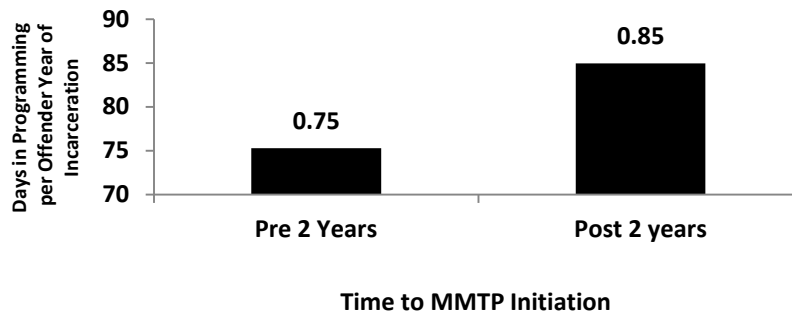


Education programs

Overall, 73.7% ($n = 1,112$) of MMTP initiates were referred for educational programming. In the two years prior to MMTP initiation, 63.8% ($n = 710$) of MMTP initiates with a need for educational programming participated in an education program, compared with 54.5% ($n = 606$) in the two years following MMTP initiation. Incidence rates were calculated to

examine the number of days that offenders (with need for educational programming) spent in education programs per offender year of incarceration and are presented in Figure 8. Offenders spent significantly more time in education programs in the two years following MMTP initiation compared to the two years prior (IR = 1.13, 95% CI 1.12-1.14).

Figure 8. Incidence Rates of Days Spent in Education Programs per Offender Year of Incarceration

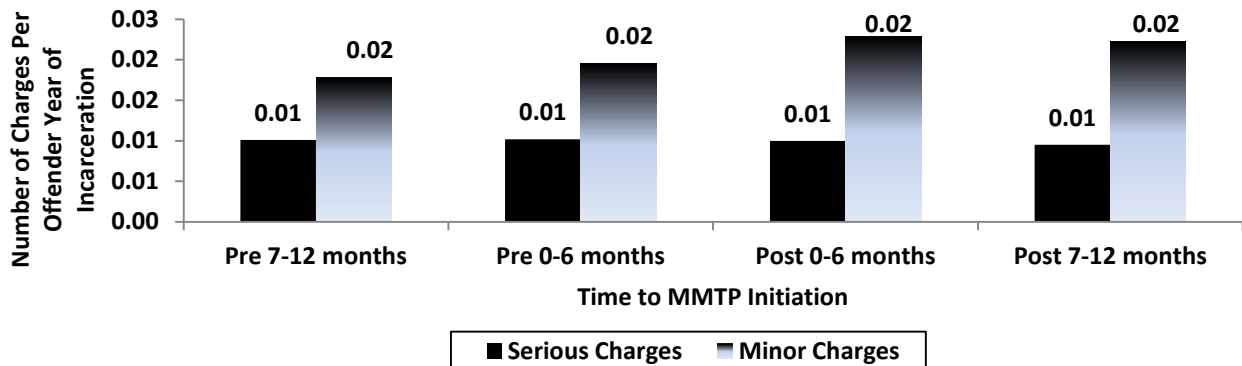


3. Disciplinary charges

Similar proportions of offenders had at least one minor charge in the year prior to MMTP initiation (53.9%, $n = 812$) and in the year following MMTP initiation (54.1%, $n = 815$), $\chi^2(1, n = 1,508) = 0.01, p = 0.91$. However, the proportion of offenders with at least one serious charge declined significantly following MMTP initiation, with 39.7% ($n = 598$) of MMTP initiates having a serious charge in the pre MMT time period, and 32.9% ($n = 496$) with a serious charge post-MMTP initiation, $\chi^2(1, n = 1,508) = 18.38, p < 0.0001$.

Incidence rates (per offender year of incarceration) for serious and minor charges were examined for MMTP initiates over six month time intervals in the pre and post one year time periods. The incidence rates in Figure 9 represent the number of serious and minor charges per offender year of incarceration during each of the time periods.

Figure 9. Incidence Rates of Serious and Minor Disciplinary Charges per Offender Year of Incarceration



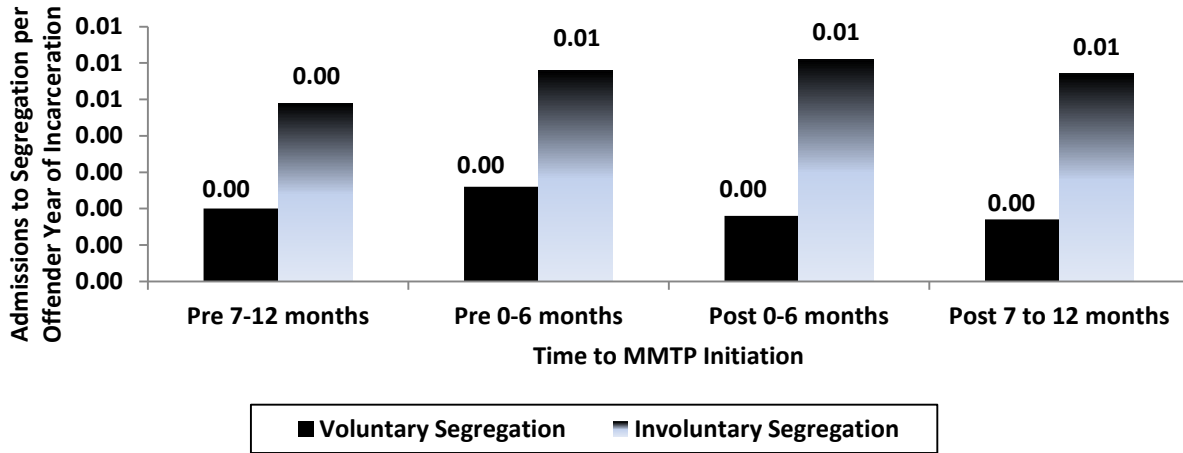
Examination of serious charges indicated that the incidence rates for MMTP initiates remained stable over time. Incidence rates for minor charges differed significantly across both pre time periods and the first 6 months following initiation, increasing steadily from the 7 to 12 month period prior to methadone initiation, to the 0 to 6 month pre initiation period and peaking in the 0 to 6 month post time period. Incidence rate ratios for minor and serious charges are presented in Appendix A.

4. Segregation

In the year prior to MMTP initiation, 14.3% ($n = 215$) of offenders were admitted to voluntary segregation, and 28.8% ($n = 434$) of offenders were admitted to involuntary segregation. In the year following MMTP initiation, 9.6% ($n = 144$) of offenders were admitted to voluntary segregation, and 25.1% ($n = 379$) of offenders were admitted to involuntary segregation. The proportion of offenders with admissions to voluntary, $\chi^2(1, n = 1,508) = 19.02$, $p < 0.0001$, and involuntary, $\chi^2(1, n = 1,508) = 6.73$, $p = 0.009$, segregation decreased significantly from the year prior to MMTP initiation to the year following MMTP initiation.

Incidence rates (per offender year of incarceration) for admissions to voluntary and involuntary segregation were examined for MMTP initiates over the pre and post time periods. The incidence rates in Figure 10 represent the number of admissions to voluntary and involuntary segregation per offender year of incarceration during each of the time periods.

Figure 10. Incidence Rates of Admissions to Voluntary and Involuntary Segregation per Offender Year of Incarceration



The rate of admissions to voluntary segregation did increase with marginal significance from the 7 to 12 month period prior to MMTP initiation, to the 0 to 6 month period prior to MMTP initiation, and decrease during the 0 to 6 month period pre MMT to the 0 to 6 month period following initiation. As well, the rate of admissions to involuntary segregation increased with marginal significance from the 7 to 12 month period prior to MMTP initiation, to the 0 to 6 month period following MMTP initiation. Otherwise, the incidence rates for admissions to voluntary and involuntary segregation did not change significantly across time periods. Incidence rate ratios for voluntary and involuntary segregation are presented in Appendix B.

Discussion

The main purpose of this study was to examine the impact of involvement in CSC's MMTP on various measures of institutional adjustment. Few studies have examined the effect of MMTP involvement on behaviours while incarcerated and, in those that have, there has been a general lack of consistency with respect to the measures used to explore this construct. Although there is no gold-standard to measure institutional adjustment, a number of studies have utilized disciplinary infractions as the primary indicator. For this report, measures were chosen based on previous research with a Canadian correctional population (Johnson et al., 2001) as well as an incorporation of indicators based on CSC's proxy measures of institutional adjustment (CSC, 2010).

Offenders initiated on methadone during incarceration account for 73% of all the participants in the MMTP between 2003 and 2008 (Johnson et al, 2011)²². These offenders are a complex, high risk and high need group with an entrenched criminal history, as evidenced by lengthy sentences and a large number of offences committed for their current sentence. In addition, they require a variety of interventions to address their criminogenic need areas, particularly in the areas of substance abuse (97%), personal/emotional orientation (90%), associates (82%), attitude (74%) and employment/education (71%).

The use of a pre-post design highlights and emphasizes the impact that participation in the MMTP has on institutional behaviour. In particular, positive urinalysis results and refusals to provide a sample significantly decreased from the pre-MMTP initiation period to the post initiation period, and the percentage of positive tests post-MMTP was more comparable to, although still slightly higher than, that of the general offender population (12.4% vs. 9.6%; CSC, 2012). In addition, the percentage of positive tests for opioids decreased over time (13% to 4%). In combination, these results highlight that one of the major goals of MMT, which is to reduce the use of opioids, is being achieved for this population. The reduction in opioid use during incarceration may also suggest a reduction in risky health behaviours such as injection drug use and needle sharing, thereby decreasing the transmission of blood borne viruses such as HCV and HIV, as well as an overall improvement in health and lowered mortality risks, as demonstrated by a large body of MMT evaluation literature (Connock et al., 2007; Marsch, 1998; Mattick et

²² The remaining 27% were continuing methadone from the community upon their incarceration.

al., 2009; Ward et al., 1999), particularly among correctional populations (Dolan et al., 2003, 2005; Hedrich et al., 2012; Stallwitz & Stover, 2007).

For offenders who participated in substance abuse programs in both the two year period prior to MMTP involvement and the two year post-initiation period, the proportion of successful attempts more than doubled, increasing from approximately 29% in the pre period to 63% in the post period. For other core programs, such as violence prevention, sex offender, and living skills programs, the proportion of successful program attempts increased from 63% in the pre period to 80% in the post period. Time spent in education and employment programs also increased pre- to post-MMTP initiation. This suggests that initiation into the MMTP during incarceration had a beneficial effect for these participants, as they were better able to address their overall criminogenic need areas through cognitive-behavioural, educational, and employment programming after MMTP initiation.

Examination of the rates of disciplinary charges and segregation data indicated little changes pre- to post-MMTP initiation. However, a key finding with respect to both of these indicators was the reduction in the overall percentage of offenders who were charged or segregated following MMTP initiation. For instance, fewer offenders were charged and found guilty of a serious disciplinary offence post-MMTP, with a reduction from 39.7% pre to 32.9% post, suggesting that they are becoming integrated into the prison environment and have improved their behaviour accordingly. In addition, the reduction in the proportion of offenders admitted to either voluntary (14.3% to 9.6%) or involuntary (28.8% to 25.1%) segregation following MMTP initiation further supports that these offenders are more easily managed in the general offender population. Based on limited research in this area, the provision of treatment programs is an important factor in decreasing institutional misconduct (i.e. disciplinary charges; Cortoni, Nunes, & Latendresse, 2006; Doherty, Ternes, Kunic, & Matheson, in press; French & Gendreau, 2006).

There were several limitations to the study that must be taken into consideration when interpreting the results. First, a comparison group was not examined. Initial analyses comparing initiating MMTP participants with those continuing MMT upon incarceration and those opioid-dependent but not accessing the MMTP were conducted and indicated that those already stabilized on MMTP and those choosing not to participate in the MMTP were not suitable comparisons, as evidenced by the sample characteristics in Appendix C. In particular, the initiating MMTP group was found to be a higher risk and higher need group with a more

entrenched criminal history.

In addition, there were a number of limitations related to data quality. The MMTP has been in existence for a number of years, however the completeness and accuracy of the data remains problematic. It is often difficult to identify MMTP participants as there is no standardized and consistent method of tracking these individuals (i.e., administrative forms exist, however they are not always completed and no comprehensive database of MMTP participants exists). As well, in instances where an MMTP participant is correctly identified, relevant information is often missing or incomplete. Missing or incomplete data had a particular impact on determining start dates for MMTP participants. A number of sources, using all the available data, were used to determine the most appropriate start date; however, the possibility of incorrect start dates exists for the MMTP participants. These are challenges related to most research that relies on administrative systems for their data collection. While not ideal, these systems provide a wealth of data that would otherwise not be available.

Furthermore, a particularly important limitation related to data quality for the current research is a lack of information pertaining to duration of MMTP participation, as the current administrative forms do not clearly identify this information. As there were no available data to verify treatment end dates, the analyses are based on one major assumption - that MMTP participation was continued for the duration of the follow up period, although this may and likely is not always be the case. This may be problematic given that the follow-up for the MMTP participants of one year or two years (depending on outcome of interest) may include time when offenders were not actually in the MMTP. An additional administrative form developed specifically to obtain MMTP start and end dates has been developed to address this limitation in future research.

Finally, the measures chosen may not necessarily be a true reflection of how offenders adjust and cope with the difficulties of incarceration. In particular, the occurrence of disciplinary charges and admissions to segregation are relatively rare events within our total sample. Therefore, using those outcomes as measures of adjustment may be setting a high standard to explore the impact of MMTP participation, particularly as MMTP may not directly target these types of outcomes. Other important elements related to the offender's health status or subjective experience of incarceration such as emotional adjustment and contact with family and friends may also be potentially important variables to consider when examining institutional adjustment. However, these types of data are challenging to measure with existing archived data, and

therefore were not examined in the current research.

Conclusions

This report provides information on a group that has not been extensively researched within Canada and, more specifically, within the Canadian correctional system. However, the results of the current study indicated that, for those with opioid addictions, being initiated on methadone while incarcerated had a positive impact on institutional behaviour including decreased substance use, and increased participation in, and completion of, programs to address their criminogenic needs. Additionally, fewer of these offenders experienced serious disciplinary charges and admissions to segregation following initiation on methadone.

Continued research examining CSC's MMTP would be beneficial. For example, a paucity of research exists within the Canadian correctional field that examines women MMTP participants. Upcoming reports will provide valuable information about the profile of incarcerated women MMTP participants as well as the impact of the MMTP on the post-release success of men and women MMTP participants. With respect to future research, it may be important to examine whether the type of opioid user (i.e., heroin, pharmaceutical, or heroin/pharmaceutical) has an impact on measures of institutional adjustment among MMTP participants. Finally, it would be beneficial to conduct another study similar to the one described in the current paper when data on duration of MMTP involvement become available.

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Appendix A

Incidence Rate Ratios for Serious and Minor Charges among MMT Initiates 1 year Pre and Post MMT Initiation

Table A1
Serious Charges

Time Period	Incidence Rate Ratio	95% Confidence Interval
Pre 7 to 12 Months – Pre 0 to 6 Months	0.98	0.88 – 1.10
Pre 0 to 6 Months – Post 0 to 6 Months	1.02	0.92 – 1.14
Post 0 to 6 Months – Post 7 to 12 Months	1.05	0.93 – 1.18

Table A2
Minor Charges

Time Period	Incidence Rate Ratio	95% Confidence Interval
Pre 7 to 12 Months – Pre 0 to 6 Months	0.91	0.84 – 0.99
Pre 0 to 6 Months – Post 0 to 6 Months	0.85	0.79 – 0.92
Post 0 to 6 Months – Post 7 to 12 Months	1.02	0.94 – 1.11

Appendix B

Incidence Rate Ratios for Voluntary and Involuntary Segregation among MMT Initiates 1 year Pre and Post MMT Initiation

Table B1
Voluntary Segregation

Time Period	Incidence Rate Ratio	95% Confidence Interval
Pre 7 to 12 Months – Pre 0 to 6 Months	0.76	0.60 – 0.98
Pre 0 to 6 Months – Post 0 to 6 Months	1.47	1.15 – 1.89
Post 0 to 6 Months – Post 7 to 12 Months	1.08	0.79 – 1.48

Table B2
Involuntary Segregation

Time Period	Incidence Rate Ratio	95% Confidence Interval
Pre 7 to 12 Months – Pre 0 to 6 Months	0.83	0.71 – 0.98
Pre 0 to 6 Months – Post 0 to 6 Months	0.96	0.83 – 1.11
Post 0 to 6 Months – Post 7 to 12 Months	1.07	0.91 – 1.27

Appendix C

Table C1

Comparison of Demographic and Sentence Characteristics, Substance Abuse Severity and Drug Use Characteristics, Criminogenic Risk and Need, Reintegration Potential and Motivation Level of Offenders Continuing MMT, Offenders Initiating MMT during incarceration, and Offenders Identified As Opioid Abusers from the Computerized Assessment of Substance Abuse (CASA) from January 2006 to December 31, 2008

Characteristic	Continuing MMT (n = 318)		Initiating MMT (n = 827)		CASA Group (n = 315)		Significance
	%	(n)	%	(n)	%	(n)	
Age at admission <i>M</i> (<i>SD</i>)	36.6	(8.4)	33.3	(8.4)	34.7	(8.5)	$F(2, 1457) = 17.45, p < .001^{++}$
Aboriginal ancestry % aboriginal (n)	20.4	(65)	15.5	(128)	16.8	(53)	$\chi^2(2, 1460) = 4.04, p = 0.13, v = 0.05$
Marital status % (n)							$\chi^2(4, 1454) = 3.19, p = 0.53, v = 0.03$
Currently married	38.7	(122)	37.4	(308)	39.1	(123)	
Previously married	8.3	(26)	8.0	(66)	10.8	(34)	
Single	53.0	(167)	54.6	(450)	50.2	(158)	
Sentence number % (n)							$\chi^2(4, 1460) = 18.86, p < 0.001, v = 0.08^{+^{\wedge}}$
1	44.7	(142)	42.7	(353)	52.4	(165)	
2	23.3	(74)	31.8	(263)	22.9	(72)	
3 or higher	32.1	(102)	25.5	(211)	24.8	(78)	
Sentence length % (n)							$\chi^2(6, 1445) = 146.03, p < 0.001, v = 0.22^{+^{\wedge}}$
2-4 years	81.1	(257)	51.5	(419)	75.9	(239)	
4-6 years	10.4	(33)	17.5	(142)	16.5	(52)	
6-8 years	5.4	(17)	8.7	(71)	3.2	(10)	
Over 8 years	3.2	(10)	22.3	(181)	4.4	(14)	
ADS							$\chi^2(4, 1425) = 20.62, p < 0.001, v = 0.09^{+^{\wedge}}$
None/low	91.1	(287)	82.3	(654)	88.3	(278)	
Moderate	4.1	(13)	7.2	(57)	7.0	(22)	
Substantial/Severe	4.8	(15)	10.6	(84)	4.8	(15)	
DAST							$\chi^2(4, 1425) = 73.18, p < 0.001, v = 0.16^{++}$
None/low	16.8	(53)	9.3	(74)	0	(0)	
Moderate	18.4	(58)	15.7	(125)	28.6	(90)	
Substantial/Severe	64.8	(204)	75.0	(596)	71.4	(225)	
Poly-substance use	63.6	(182)	60.5	(379)	64.4	(203)	$\chi^2(2, 1227) = 1.66, p = 0.44, v = 0.04$

Characteristic	Continuing MMT (n = 318)	Initiating MMT (n= 827)	CASA Group (n = 315)	Significance
Opioide of choice				$\chi^2(4, 1150) = 18.63, p < 0.0001, v = 0.09^{+\sim}$
Heroin	34.4 (83)	28.8 (171)	21.6 (68)	
Pharmaceutical	48.1 (116)	50.7 (301)	62.9 (198)	
Heroin/Pharmaceutical	17.4 (42)	20.5 (122)	15.6 (49)	
Risk				$\chi^2(4, 1435) = 19.86, p = 0.0005, v = 0.08^{\wedge+}$
Low	6.1 (19)	3.7 (30)	6.8 (21)	
Moderate	42.0 (131)	34.6 (282)	43.7 (134)	
High	51.9 (162)	61.8 (504)	49.5 (152)	
Need				$\chi^2(4, 1435) = 10.81, p = 0.03, v = 0.06^{\sim+}$
Low	2.2 (7)	1.1 (9)	2.0 (6)	
Medium	19.6 (61)	21.3 (174)	28.3 (87)	
High	78.2 (244)	77.6 (633)	69.7 (214)	
Reintegration potential				$\chi^2(4, 1283) = 15.42, p = 0.004, v = 0.08^{\wedge+}$
Low	44.6 (133)	52.8 (358)	41.0 (126)	
Moderate	30.9 (92)	28.9 (196)	33.2 (102)	
High	24.5 (73)	18.3 (124)	25.7 (79)	
Motivation level				$\chi^2(4, 1283) = 12.25, p = 0.02, v = 0.07^{\sim+}$
Low	15.4 (46)	16.4 (111)	8.5 (26)	
Moderate	70.1 (209)	69.5 (471)	73.6 (226)	
High	14.4 (43)	14.2 (96)	17.9 (55)	

Note. ⁺ = significant ($p < .05$) differences between initiating MMT group and CASA comparison group; [^] = significant ($p < .05$) differences between initiating MMT group and continuing MMT group; [~] = significant ($p < .05$) differences between continuing MMT group and CASA comparison group; ⁺⁺ = significant ($p < .05$) differences between all three groups.

Note. Missing values: Marital status - 3 from continuing MMT group and 3 from initiating MMT group; Sentence length - 1 from continuing MMT group and 14 from initiating MMT group; ADS and DAST - 3 from continuing MMT group and 32 from initiating MMT group; Poly-substance use - 32 from continuing MMT group and 201 from initiating MMT group; Opioid of choice - 77 from continuing MMT group and 233 from initiating MMT group; Risk - 6 in continuing MMT group, 11 in initiating MMT group, and 8 in CASA group; Criminogenic Need - 6 in continuing MMT group, 11 in initiating MMT group and 8 in the CASA comparison group; Motivation level and reintegration potential - 20 from continuing MMT group, 149 from initiating MMT group and 8 from CASA comparison group.