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Initiating buprenorphine treatment prior to versus after release from prison: Arrest outcomes

Michael S. Gordon[a,*], Thomas R. Blue[a], Kathryn Couvillion[a], Robert P. Schwartz[a], Kevin E. O'Grady[b], Terrence T. Fitzgerald[c], Frank J. Vocci[a]

[a] Friends Research Institute, 1040 Park Avenue, Suite 103, Baltimore, MD 21201, USA
[b] Department of Psychology, University of Maryland, 4094 Campus Dr., College Park, MD 20742, USA
[c] Glenwood Life Counseling Center, 516 Glenwood Ave, Baltimore, MD 21212, USA

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ABSTRACT

Background: This secondary analysis of a randomized trial examines the association between initiation of buprenorphine treatment prior to, versus post-release, and rearrests during the 12-months following release.
Methods: Official rearrest data ($N = 199$) for the 12-months post-release were examined. Four outcomes were measured: (1) rearrested (yes/no), (2) time to rearrest, (3) number of rearrests, and (4) severity of charges (less severe *vs.* severe).
Results: A minority (43.1%) of the sample were rearrested ($N = 91$). There were no significant differences between study conditions in the proportion of rearrested participants [$P = 0.28$] nor in the mean number of arrests [$P = 0.15$]. Likewise, the condition was not a significant predictor of the hazard of rearrest [$p = 0.10$]. The mean number of days until rearrest for the in prison vs. post-release buprenorphine conditions were not significantly different (205.8 days ($SD = 104.6$) *vs.* 170.8 days ($SD = 113.1$), respectively; $P = 0.13$]. Treatment condition was not a significant predictor of the likelihood of rearrest for a severe crime compared to a less severe crime [$P = 0.09$].
Conclusion: Despite the parent study finding of higher rates of post-release drug treatment entry in the group assigned to start buprenorphine treatment prior to, compared to post-release, there were no significant differences in the proportion of individuals arrested, the mean number of arrests, the time to first arrest, or the severity of their charges.

1. Introduction

Relapse to opioid use after release from prison is a serious problem among prisoners with opioid use disorder (OUD) throughout the world. Prisoners have a disproportionately higher rate of OUD than the general populations (Dolan et al., 2007; Fazel et al., 2006; Kanato, 2008; Kastelic et al., 2008; Kinlock et al., 2011). The United States (US) leads the world in the number of prisoners (2.17 million) and the rate of incarceration (670 per 100,000 population; (Kaeble et al., 2016)). It has been estimated that about 15% of US prisoners have histories of opioid addiction (Mumola and Karberg, 2006). Thus, there is a considerable need to deliver effective treatment for this population.

The three FDA-approved pharmacotherapies (e.g., methadone, buprenorphine, and naltrexone) used to treat OUD are infrequently used prior to release (Fox, 2015). Given their demonstrated efficacy in community settings (Lee et al., 2016; Mattick et al., 2014), this is a lost opportunity to prevent illicit opioid use in prison and relapse upon release for individuals who have maintained opioid abstinence during incarceration. Newly-released inmates have a high risk of opioid overdose death within their first month in the community (Binswanger et al., 2011, 2012; Binswanger et al., 2007; Bird and Hutchinson, 2003; Farrell and Marsden, 2008; Krinsky et al., 2009; Merrall et al., 2010; Marsden et al., 2017; Stewart et al., 2004) and are at risk for HIV and hepatitis B and C infections (Dolan et al., 2007; Inciardi, 2008; Kanato, 2008). Opioid use among newly-released inmates also has adverse public safety consequences, as it is associated with criminal activity (Hough, 2002; Inciardi, 2008; Kinlock et al., 2003) and re-incarceration (Dolan et al., 2005; Hough, 2002; Metz et al., 2010). Given the focus of correctional settings on reducing recidivism, research is needed on approaches, including pharmacotherapy, to reduce both the criminal behavior and the rearrest following release from prison.

Adults with opioid use disorder frequently engage in illegal activities, which are positively correlated with the frequency of illicit opioid use (Anglin and Speckart, 1988; Inciardi, 2008). These activities are

* Corresponding author.
E-mail address: mgordon@friendsresearch.org (M.S. Gordon).

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most frequently related to possession and sale of illicit opioids and acquisitive crimes such as shoplifting and burglary to obtain funds for drugs (Ball and Ross, 2012). While self-reported criminal behavior is often considered accurate when reported under research confidential conditions (Chaiken and Chaiken, 1990; Nurco, 1985), it is subject to underreporting. An alternative to self-report measures of criminal behavior is objective data from official arrest records. These data are not subject to underreporting, although they underestimate the number of crimes committed (Nurco, 1998) and are subject to fluctuations in local police practices (Schwartz et al., 2017). Nevertheless, capturing arrest data is of some importance given the impact of the number and types of arrests on the police, the judiciary, the correctional system, and their associated costs to society. Arrest data are also important indicators of the success of correctional systems generally, and of treatment approaches for prisoners with opioid addictions in particular.

The published random assignment studies that have examined the association between initiating pharmacotherapy for opioid use disorder prior to versus after release from incarceration found no differences in self-reported arrests at post-release follow-up of varying durations (Kinlock et al., 2009; Lee et al., 2015; Magura et al., 2009; McKenzie et al., 2012).Two such trials found no difference in self-reported arrest rates between conditions in which participants were assigned to initiate methadone either during or after release from prison over a 6-month follow-up (McKenzie et al., 2012) and 12-month follow-up period (Kinlock et al., 2009). Magura et al. (2009) found no difference in self-reported arrest rates at 3-month follow-up between conditions in which participants were assigned to initiate either methadone or buprenorphine prior to release. Finally, one pilot study, which was able to examine the New York City jail admission database for the arrest status of participants lost to follow-up, found no difference in arrest rates within an 8-week follow-up between conditions in which participants were provided either extended-release naltrexone or no medication prior to release (Lee et al., 2015).

Our research group previously reported on a randomized clinical trial comparing post-release outcomes of prisoners with a pre-incarceration history of DSM-IV defined opioid dependence who were offered 12 weeks of counseling in prison and were randomly assigned to begin sublingual buprenorphine/naloxone prior to *vs*. post-release (Gordon et al., 2014, 2017). This study found that participants randomly assigned to initiate buprenorphine in prison were significantly more likely to enter and remain in buprenorphine treatment post-release compared to those participants who were assigned to begin buprenorphine in the community (Gordon et al., 2017). However, notwithstanding greater community treatment exposure, there were no significant differences in heroin and cocaine use during the 12-month follow-up (Gordon et al., 2017).

1.1. The present study

Here we present findings from a secondary analysis from the above-mentioned clinical trial comparing the impact on official rearrest data during the 12-month post-prison release follow-up period of being assigned to initiate buprenorphine treatment prior to *vs*. post-release. We hypothesized that because of the advantages conferred by initiating buprenorphine treatment in prison (higher rates of treatment entry and retention in the community), participants who initiated buprenorphine in prison compared to post-release would, over the 12-month follow-up period: (1) be less likely to be rearrested in the 12-month post-release period, (2) have longer time to first rearrest, (3) be rearrested fewer times, and (4) be less likely to be rearrested for a severe crime (e.g., burglary, assault and battery, robbery, kidnapping, murder, rape)

2. Methods

2.1. Parent study

Parent study participants were 211 adult prisoners with a history of DSM-IV defined opioid dependence in the year prior to their index incarceration. They were recruited between 2008 and 2012 within 3–9 months prior to release. All participants were offered 12 weekly group counseling sessions during prison and were randomly assigned to receive sublingual buprenorphine/naloxone (bup/nal), hereafter called buprenorphine, in prison or post-release and randomly assigned to receive buprenorphine treatment post-release in either an opioid treatment program (OTP) or non-OTP outpatient drug treatment program. Because most of the participants were not opioid-tolerant at the time of study recruitment, bup/nal was started at low doses (1/0.25 mg daily) and increased much more slowly (e.g., increase of 1/0.25 mg per week until reaching 4 mg/1 mg with subsequent increases by 2 mg/0.5 mg per week to reach 8 mg/2 mg) than would be used for opioid-tolerant patients in the community (see (Vocci et al., 2015) for details). A detailed description of methods and outcomes in the parent study can be found elsewhere (Gordon et al., 2014, 2017). The study was approved by the Friends Research Institute's Institutional Review Board and the Maryland Department of Public Safety and Correctional Services (DPSCS) Research Committee, and the Federal Office of Human Research Protections. The ClinicalTrials.gov identifier is NCT 00574067.

2.2. Arrest data

As part of the study protocol, Maryland's DPSCS provided the researchers the official arrest data for study participants for the first 12-months after release from each individual's index incarceration. Data included dates of arrest and specific charges. Participants' data were extracted for the 12-month period following their respective release date and were matched using their: (1) names, (2) social security numbers, (3) dates of birth, (4) DPSCS identification number, (5) gender; (6) and race. DPSCS records could not be located for 12 participants; consequently, they were excluded from the present study.

Individuals with at least one arrest within the postrelease period were considered to have been rearrested. The number of times each was arrested was also recorded. As shown in Table 1, arrest data were coded for severity on a scale from lowest (1) to highest (7) (Schwartz et al., 2009) that was adapted from a crime severity rating scale developed by Nurco et al. (1991). Offenses involving the use of violence (e.g., homicide, rape, assault) or that could quickly lead to violence (burglary, robbery) were considered the most severe followed by those involving a loss or destruction of property (e.g., theft, vandalism), and offenses for which there is no immediate victim (e.g., drug possession, prostitution). Previous research has found that rating crime severity in this manner produces a high degree of interrater agreement as measured by an

Table 1
Crime Severity Scale Scoring Examples.

Severity Rating	Examples
1	Prostitution, possession of a controlled, dangerous substance, violation of probation/parole
2	Violation of a protection order, trespassing, disorderly conduct, malicious destruction of property less than $500
3	Theft less than $500, malicious destruction of property greater than $500, forgery, uttering
4	Theft greater than $500, possession of a deadly weapon, drug distribution or manufacturing
5	Burglary, second degree assault, battery
6	Robbery, first degree assault, kidnapping
7	Attempted first degree murder, first degree murder, rape

Adapted from Schwartz et al. (2009). Scores greater than 4 are considered severe crimes. Scores less than or equal to 4 are considered less severe crimes.