



Utilization and outcomes of detoxification and maintenance treatment for opioid dependence in publicly-funded facilities in California, USA: 1991–2012



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ABSTRACT

Background: California treats the largest population of opioid dependent individuals in the USA and is among a small group of states that applies regulations for opioid treatment that are more stringent than existing federal regulations. We aim to characterize changes in patient characteristics and treatment utilization over time, and identify determinants of successful completion of detoxification and MMT retention in repeated attempts.

Methods: State-wide administrative data was obtained from California Outcome Measurement System during the period: January 1st, 1991–March 31st, 2012. Short-term detoxification treatment and long-term maintenance treatment, primarily with methadone, was available to study participants. Mixed effects regression models were used to define determinants of successful completion of the detoxification treatment protocol (as classified by treatment staff) and duration of maintenance treatment.

Results: The study sample consisted of 237,709 unique individuals and 885,971 treatment episodes; 837% were detoxification treatment episodes in 1994, dropping to 40.5% in 2010. Among individuals accessing only detoxification, the adjusted odds of success declined with each successive attempt (vs. 1st attempt: 2nd: OR: 0.679; 95% CI (0.610, 0.755); 3rd: 0.557 (0.484, 0.641); 4th: 0.526 (0.445, 0.622); 5th: 0.407 (0.334, 0.497); ≥ 6 th: 0.339 (0.288, 0.399)). For those ever accessing maintenance treatment, later subsequent attempts were longer in duration, and those with two or more prior attempts at detoxification had marginally longer subsequent maintenance episodes (hazard ratio: 0.97; 95% CI: 0.95, 0.99). Finally, only 10.9% of all detoxification episodes were followed by admission into maintenance treatment within 14 days.

Conclusions: This study has revealed high rates of detoxification treatment for opioid dependence in California throughout the study period, and decreasing odds of success in repeated attempts at detoxification.

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1. Introduction

The most populous state in the USA, California treats the largest population of opioid dependent individuals (Substance Abuse and Mental Health Services Administration (SAMHSA, 2011) and is

among a small group of states that applies regulations for opioid treatment that are more stringent than existing federal regulations. Specifically, to qualify for admission to methadone maintenance treatment (MMT) federal regulations require fulfilment of diagnostic criteria and documentation of at least a one-year history of opioid dependence. In contrast, California regulations require a two-year documented history and, in addition to fulfilment of diagnostic criteria, two failed attempts at detoxification. Further, federal regulations do not limit the duration of detoxification treatment whereas California regulations limit it to 21 days. Individual and programmatic exceptions for long-term detoxification

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(up to 180 days) and immediate access to maintenance treatment (as opposed to requiring two failed detoxification attempts) are available in California and are believed to be widely applied. Finally, federal regulations specify that no patient may be admitted to the same detoxification program more than twice in a one-year period without a patient-specific federal waiver. Although California regulations do not limit the number of admissions for detoxification, the state additionally requires at least seven days between detoxification treatment episodes (Stephenson, 2008).

Limited-term treatment for opioid-dependence is inconsistent with the disease's known chronic, recurrent course (McLellan et al., 2000). Systematic reviews of detoxification for opioid dependence have noted high rates of relapse, and suggest that the goal of detoxification should not be to provide treatment per se but rather to remove or reduce dependence on heroin in a controlled fashion (Amato et al., 2004; SAMHSA, 2006). Critically, opioid-dependent individuals are exposed to substantially elevated risk of mortality when out of treatment. In a systematic review of heroin users in either detoxification or maintenance-oriented treatment, the relative risk of mortality out-of-treatment was estimated to be 24 times greater than during treatment (Degenhardt et al., 2011). Further, a population-level study of opioid substitution treatment clients in Australia found the risk of mortality peaks in the two weeks following initiation, and discontinuation of treatment (Degenhardt et al., 2009).

California's opioid dependence treatment guidelines acknowledge the limitations of detoxification and the caveat that it should not be considered treatment for opioid dependence (Stephenson, 2008), yet it remains state-wide policy. As of March 2010, California featured 146 state-certified opioid treatment programs; 930% offered only methadone detoxification, while 70% offered MMT (compared to 313% nationally; SAMHSA, 2010).

To be clear, MMT is the most effective form of treatment for opioid dependence (SAMHSA, 2010). Prolonged retention in methadone treatment typically results in decreases in illicit drug use, HIV risk behaviors, and acquisitive crime (Amato et al., 2005). While programmatic restrictions have had mixed results (Ball and Ross, 1991; McCarthy and Borders, 1985; Peles et al., 2006), higher daily doses (Faggiano et al., 2003; Nosyk et al., 2009) are known predictors of positive outcome, and retention improves in subsequent treatment attempts (Nosyk et al., 2009). Further, MMT can provide positive synergies with the treatment and prevention of HIV and Hepatitis C Virus (Volkow and Montaner, 2011; Alter and Liang, 2012).

Nationally, two key changes in the opioid dependence epidemic and treatment delivery occurred over the past 20 years. First, buprenorphine treatment was introduced into office-based settings in 2003 (US Food and Drug Administration, 2002). By 2008, it was estimated that some 140,000 patients in the US were receiving maintenance treatment using buprenorphine (Kleber, 2008). Second, prescribed opioids (PO) rapidly displaced heroin as the most prevalent opioids abused in America. It is estimated that there are approximately 23 million individuals in the USA with opioid dependence or abuse, 19 million of which abuse POs (SAMHSA, 2009).

It is within this context that we evaluate outcomes for the treatment of opioid dependence in the state of California. Using population-level data on opioid treatment in publicly-funded facilities from 1991 to 2012, we consider repeated attempts at opioid detoxification and MMT over time for a cohort of nearly a quarter-million unique individuals. We focus specifically on characterizing changes in patient characteristics and treatment utilization over time, and identifying determinants of successful completion of detoxification and MMT retention in repeated attempts.

2. Methods

2.1. Study population

The study population included all individuals presenting for MMT in publicly-funded drug treatment centers (DTCs) in California from January 1st, 1991 to March 31st, 2012. Information received from all treatment programs receiving state or federal funding are recorded by the California Department of Alcohol and Drug Programs (ADP; California Department of Alcohol and Drug Programs, 2012a, 2005). Each DTC licensed to dispense methadone in California is required to submit data on each client admitted to their program monthly to the state alcohol and drug programs office regardless of funding source (California Department of Alcohol and Drug Programs, 2012b). There are five Veteran's Health Administration-based DTCs that do not submit data to the system; as a result, opioid agonist treatment clients receiving treatment solely from these facilities were excluded from the analysis.

2.2. Data collection

Data was entered into the California Alcohol and Drug Data System (CADD) from 1991 to 2006, and the California Outcomes Monitoring system (CaOMS) from 2006 to 2011. Data compliance standards (Hser et al., 2003) specify data should be submitted each month and no later than 45 days after the end of the report month (i.e., the calendar month in which the admissions, discharges, or annual updates occur). Also, admission and discharge records can be corrected or deleted anytime within 75 days. Providers inspect and verify data compliance and quality through automated summary reports. Standard documentation (written, online, and periodic in-person training) is available to providers reporting to the system, and many specific research studies or county initiatives have included training for providers and have assessed compliance (Rawson and Crevecoeur, 2005; Urada et al., 2010; Breslow and Clayton, 1993).

Treatment program staff entered information on medication or treatment type, individual demographic, drug use, and other information at admission. At discharge, staff classify disposition of the episode as (completed treatment/recovery plan; left before completion, with satisfactory progress; left before completion, with unsatisfactory progress, or referred or transferred for further treatment). Discharge records are filed for methadone detoxification when the participant has missed appointments for ≥ 3 consecutive days without notifying the program, or in MMT, when the participant has missed appointments for ≥ 14 days without notifying the program.

Successive treatment episodes were merged when discharge and subsequent admission dates were within the 3- and 14-day discontinuation thresholds for detoxification and maintenance episodes, respectively. However, detoxification episodes directly preceding maintenance episodes (i.e. discharge within 3 days of maintenance treatment initiation) were not merged as transition from detoxification into a maintenance program can be considered a successful outcome and was thus an explicit point of analysis. The earliest available admission and latest available discharge status records of episodes consolidated from >1 treatment episode records were used. Otherwise, discharge dates were imputed if records were not available for episode t , but a subsequent episode $t+1$ was later initiated; in this case we assumed a discharge date of (episode start date($t+1$) - 14) for episode t . Alternately, we assumed the population median durations of detoxification and maintenance episodes in sensitivity analysis.

2.3. Measures

2.3.1. Dependent variables. For detoxification episodes, the primary outcome was (reported) patient status at episode discharge. A detoxification episode was classified as 'successful' if treatment program staff classified the episode as "successful completion" or "left treatment early but with satisfactory progress". Alternate classifications of success were tested in sensitivity analysis. Detoxification episodes were classified as unsuccessful if no discharge status records were available. For maintenance episodes, the primary outcome was the duration of treatment calculated as the difference of the discharge and admission dates. Maintenance episodes ongoing after March 16th, 2012 were considered censored.

2.3.2. Independent variables. We hypothesized that individual demographics, drug use characteristics, and characteristics of the treatment episode, facility, and county influenced the selected treatment outcomes. Demographics and drug use characteristics included age, gender, ethnicity, primary drug of abuse (heroin versus prescribed opioids), primary drug use frequency, secondary drug of abuse (none; other opioid; stimulant; alcohol or marijuana), education, labor force status, and referral source (individual choice or otherwise).

Otherwise, we constructed a series of covariates indicating the number of detoxification and MMT episodes. Among those accessing MMT, a variable was created to indicate whether an individual had <2 or ≥ 2 successive detoxification episodes prior to the current MMT episode.

Using the reported Provider ID field in the study database, we constructed an additional covariate to capture the annual volume of treatment episodes within each site in a given calendar year. This annualized facility-specific measure for opioid treatment volume was categorized into quartiles according to the empirical distribution of the episodic dataset. Finally, using the patient-level

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