

Laura G Duncan¹, Sonia Mendoza^{2*} and Helena Hansen^{2,3}

¹University of California, San Francisco

²New York University

³The Nathan S. Kline Institute for Psychiatric Research

Dates: Received: 21 April, 2015; Accepted: 31 July, 2015; Published: 03 August, 2015

***Corresponding author:** Sonia Mendoza, New York University, 25 Waverly Place Rm 608, New York, NY 10003, 718-872-8587; E-mail: sonia.mendoza@nyumc.org

www.peertechz.com

ISSN: 2455-3484

Keywords: Buprenorphine; Addiction; Public healthcare; Low-income; Opioids

Review Article

Buprenorphine Maintenance for Opioid Dependence in Public Sector Healthcare: Benefits and Barriers

Abstract

Background: Since its U.S. FDA approval in 2002, buprenorphine has been available for maintenance treatment of opiate dependence in primary care physicians' offices. Though buprenorphine was intended to facilitate access to treatment, disparities in utilization have emerged; while buprenorphine treatment is widely used in private care setting, public healthcare integration of buprenorphine lags behind.

Results: Through a review of the literature, we found that U.S. disparities are partly due to a shortage of certified prescribers, concern of patient diversion, as well as economic and institutional barriers. Disparity of buprenorphine treatment dissemination is concerning since buprenorphine treatment has specific characteristics that are especially suited for low-income patient population in public sector healthcare such as flexible dosing schedules, ease of concurrently treating co-morbidities such as HIV and hepatitis C, positive patient attitudes towards treatment, and the potential of reducing addiction treatment stigma.

Conclusion: As the gap between buprenorphine treatment in public sector settings and private sector settings persists in the U.S., current research suggests ways to facilitate its dissemination.

Introduction

Upon FDA approval in 2002, buprenorphine became the first opioid medication in the U.S. since the 1914 Harrison Act that could be used for opiate dependence maintenance treatment in primary care physicians' offices. This shift promoted integration of opiate dependence treatment into general medicine and some suggested that buprenorphine would attract new patients by providing an alternative to highly regulated methadone clinics [1]. Buprenorphine maintenance treatment implementation was intended for private practice treatment and current rates show that buprenorphine treatment does, in fact, primarily take place in private practices [2-5]. Buprenorphine is a partial opiate agonist with a limited ability to suppress breathing compared to methadone which is a complete agonist, and is primarily available in the U.S. under two different formulations known as Suboxone (buprenorphine/naloxone) and Subutex (buprenorphine) [6]. Buprenorphine offered a potential harm reduction tool for low-income patients with medical co-morbidities and for those at high risk for HIV, hepatitis C, and opiate overdose [6]. In this article, we argue that buprenorphine maintenance treatment is especially suited for implementation in U.S. public hospital and other government funded non-profit settings where vulnerable populations are primarily served.

Although there has not been a recent national representative demographic study in almost a decade, the latest, most complete U.S. based report from 2006 found that buprenorphine patients are Caucasian, are employed full time, and are seeking treatment for heroin or prescription opioid dependence [7]. Most buprenorphine patients were treated in private physician practices [7,8], and paid out-of-pocket [9] or were privately insured [10]. A study mapping buprenorphine prescriptions in New York City, the U.S. city with the

largest opiate dependent population, confirmed higher prescription rates in high-income residential areas with low percentages of African American and Hispanic residents [11].

Treatment rate disparities have been fueled by the focus of buprenorphine marketing on the private sector [12] and by the perception that office-based buprenorphine treatment is most appropriate for employed, and therefore "stable," patients [14,15]. Buprenorphine has been increasingly prescribed by primary care physicians; primary care physicians compose 63.5% of buprenorphine maintenance treatment providers in 2013 [5]. Despite an increase in buprenorphine maintenance providers, Stein et al found that 43% of U.S. counties have zero buprenorphine providers [15].

Buprenorphine's comparable effectiveness to methadone in treating opioid addiction [16] and its tested suitability for varying therapeutic settings should be highlighted to promote implementation in public healthcare settings [17]. Buprenorphine maintenance treatment has additional characteristics that make it useful in the public sector, such as: 1) enhanced accessibility due to multiple venues for treatment, 2) flexible dosing that requires less institutional oversight than methadone, 3) demonstrated effectiveness among populations that heavily rely on public healthcare systems, such as the formerly incarcerated, and the homeless, 4) the potential to treat co-morbid chronic conditions prevalent among opiate dependent people such as HIV, and 5) the potential to lessen the stigma correlated with drug dependency among low income patients and ethnic minorities who already experience other forms of culturally defined social stigmatization [18,19]. This accumulated data can be used to improve the accessibility of buprenorphine as a first line treatment for heroin and opioid dependence for patients in public clinics.

Causes of Treatment Disparities

The Drug Addiction Treatment Act of 2000 allowed for qualified physicians to seek certification to become waived buprenorphine prescribers. However, only 3% of primary care physicians have buprenorphine waivers; [20] as of 2011, only 7% of U.S. counties had 20 or more buprenorphine providers [5]. Thomas et al. [21] found that while two-thirds of addiction specialists treated patients with buprenorphine, fewer than 10% of non-addiction specialist psychiatrists prescribed it. Many physicians feel they lack institutional support, experience, and training for themselves and clinic staff, and feel that the required 8-hour buprenorphine certification training is insufficient [22]. Physicians also reported inadequate institutional support as a major barrier to prescribing buprenorphine [23,24]. In the U.S., where addiction has historically been treated in specialty settings, many primary care providers perceive themselves as unprepared to discuss drug use with patients [25], even if they have already been treating known opioid users [22]. In a recent study regarding the barriers to buprenorphine maintenance treatment by family practitioners, physicians stated that their main barriers were inadequately trained staff and insufficient time as well as lack of knowledge, difficult patient population, and mistrust of opioid dependent patients [26]. Some physicians report concern about deception, suspicion of patient reported withdrawal symptoms [27], or worry that such patients would be disproportionately late to appointments [22]. Negative provider attitudes can also affect buprenorphine treatment rates; Krull et al. [28] found that directors of addiction treatment programs serving homeless patients generally had negative attitudes towards buprenorphine use, indicating a need for education of public service providers about the clinically efficacy of buprenorphine.

Correspondingly, physicians' positive attitudes toward opioid maintained patients are associated with their willingness to treat them [29]. Cunningham et al. [30] found that physicians in primary care programs were more likely to express interest in prescribing buprenorphine than those in specialty care, suggesting opportunities for expansion of primary care based buprenorphine treatment. A recent study found that increasing the number of buprenorphine providers proportionally increased the number of buprenorphine treatment, suggesting that the current paucity of buprenorphine providers is limiting treatment opportunity [31].

Risk of buprenorphine diversion has also been cited as a major reason to not offer buprenorphine in public healthcare settings. A 2014 analysis of the factors associated with buprenorphine noncompliance found that use of benzodiazepines and psychiatric co-morbidities were associated with buprenorphine diversion [32]. The co-prescription and use of benzodiazepines with buprenorphine is harmful as both are respiratory suppressants and increase the risk of overdose [33,34]. As psychiatric co-morbidities and poly-substance dependence and abuse is common among opiate dependent patients [35], this could confound reasons for which providers without addiction medicine training or resources do not offer buprenorphine maintenance treatment.

The current profile of an illicit buprenorphine user is that of an experienced opioid user, having a history of snorting opioids, and

identifying as Caucasian [36]. Patients in private practice are more likely to fit this profile than public sector patients who are more likely to be heroin users and to identify as African American or Hispanic. Physicians may not be likely sources for diverted buprenorphine since illicit buprenorphine users report obtaining the medication from a dealer, family member or friend, but not directly from a physician [37]. Primary reasons given for using diverted buprenorphine or injecting the medication were to suppress withdrawal symptoms and to modify a perceived inadequate dose [38,39]. While unemployment status was associated with increased risk of using diverted buprenorphine, an analysis found that receiving disability benefits decreased risk of using diverted buprenorphine [37], pointing to financial stability and social services as counteracting buprenorphine diversion. Illicit buprenorphine use is correlated with better treatment outcomes in primary care buprenorphine programs [40], and again suggests that a proportion of illicit buprenorphine users are attempting self-medication. Additionally, a social network analysis of buprenorphine diversion found that increasing access to providers reduced diversion rates [37].

Buprenorphine cost, reimbursement, and insurance coverage are also barriers to treatment in a public setting [7]. Ducharme and Abraham found in their 2008 analysis of the incorporation of buprenorphine maintenance treatment that government owned, non-profit programs were less likely to adopt buprenorphine than private, for profit programs [41]. Veteran Administration hospital dispensing data calculated that the cost of 6 months of buprenorphine care is comparable to that of methadone care over the same time span [42]. However, buprenorphine is excluded from most private health insurance plans or placed on the highest-tier formulary in order to control overall escalating prescription costs [43], while Medicaid coverage varies by state and is subject to restrictions. Office-based buprenorphine treatment has been shown to attract new patient populations [1,7], and Medicaid recipients are one of the fastest growing groups interested in the treatment [44]. Because substance abuse treatment without medication leads to greater relapse-related expenses and higher mortality, Medicaid coverage for buprenorphine treatment has been found to be cost effective in the long run [45] and changes in Medicaid reimbursement processes may lessen the gap between private and public sector treatment.

Benefits of Integration into Public Sector

Multiple studies and reviews have established the effectiveness of buprenorphine for heroin [46] and prescription opioid dependence treatment [47], demonstrating a comparable effectiveness, safety, and treatment retention to methadone [16,48,49]. Buprenorphine has also demonstrated high patient satisfaction ratings [49] and a relatively low side effect profile [48]. Due to its federal approval for office-based use, buprenorphine can potentially offer flexible dosing and treatment location options. Varying buprenorphine dosing schedules (weekly vs. thrice-weekly) are similarly effective [50] and may offer better outcomes for some patients who do not show improvement on standard low doses [51]. Buprenorphine home induction demonstrated feasibility and safety with low withdrawal symptoms and similar retention rates to in-clinic induction [52]. Home-based inductions may also be a timesaving method for clinics

that are not able to accommodate patients in active withdrawal [53]. Multiple counseling structures can offer benefits, including varying the timing and type of counseling⁵⁴⁻⁵⁶ to accommodate patient needs.

Buprenorphine treatment has been especially beneficial for opioid dependent populations with medical co-morbidities, the formerly incarcerated and homeless patients. A New York City based study tracked heroin users over a year and identified buprenorphine as a valuable harm reduction tool for socially marginalized users [2]. Past incarceration has no effect on primary care buprenorphine treatment outcomes [54,55], and previously incarcerated patients on buprenorphine treatment had better adherence and similar retention rates than those on methadone treatment [56]. The San Francisco Department of Public Health piloted a program offering office-based buprenorphine to patients who were homeless, unemployed, or living in poverty and found positive patient impressions, good retention rates, a positive shift in provider practices, and a decline in opioid use [57]. No significant differences in retention rates were found due to age, ethnicity, employment, or housing status. In a separate study of homeless patients, buprenorphine treatment was also associated with obtaining housing [28].

Primary care buprenorphine treatment has been associated with not only the treatment of chronic medical problems, but also the identification of previously unrecognized illness [56]. Bonhomme et al found that ethnic minorities with dual diagnosis of psychiatric illness and substance abuse tend to access healthcare in primary care settings [59]. HIV-positive patients suffering from opioid dependence may also benefit from combination buprenorphine treatment not only for reducing opioid use [60], but also increasing initiation or maintenance on antiretroviral treatment and improved CD4 counts [61]. Buprenorphine treatment has also been correlated with decreased injection drug use and lowering HIV risk behaviors [62]. Turner et al found that New York State physicians in clinics providing HIV care and physicians with experience treating intravenous drug users expressed more interest in providing buprenorphine than other physicians [29], making these settings a potential site for buprenorphine treatment integration.

An important facilitator to expansion of care in different settings is patients' positive attitude toward buprenorphine treatment in primary care. Surveyed patients were satisfied with concurrent treatment for other health problems since it reduced their total number of medical appointments [22]. Patients also found that treatment locations were more convenient and were removed from illicit drug markets that often predominate around and near methadone clinics [22,63]. Patients were also satisfied with developing patient-provider relationships with primary care physicians and clinic staff [46] and favored "patient-focused" treatment where they felt they were offered autonomy, support, and trust from their provider [63]. A market survey at a South Bronx primary care clinic showed that there was high interest in buprenorphine as a mode of treatment for first time, low-income, substance abuse patients [64]. Additionally, patients who had previous experiences with both methadone and buprenorphine treatments preferred buprenorphine when readmitted to treatment, indicating that buprenorphine was a more attractive alternative to methadone [65].

In a review of the social stigma associated with substance dependence compared to mental illness, Schomerus et al found that drug users carried a greater burden of stigma and were seen as irrational, dangerous, and worthy of social rejection [66]. Methadone programs similarly are often marked by stigma due to punitive approaches to patients, staff characterization of patients as criminal or "dirty," and barriers to social reintegration such as limited dispensing hours that coincide with work hours [57]. Providers holding negative views of methadone treatment for opiate dependence anticipated that office-based buprenorphine would reduce the stigma of drug dependence by removing addiction treatment from specialty clinics [22,47]. Stigma reduction is especially important for low income and ethnic minority patients who confront multiple sources of social marginalization in the U.S. Fareed et al. [51] report that patients felt more like a routine medical patient than an addiction patient when treated in a primary care buprenorphine clinic. Chiefly, positive patient-provider relationships associated with positive addiction treatment outcomes can be forged in primary care settings; such positive relationships are defined as consisting of organizational access, visit-based continuity, and knowledge of the patient as a "whole person" including an understanding of patient's responsibilities, values, and beliefs outside of the clinic [67].

Discussion

Although buprenorphine treatment rates in the public sector settings lag behind rates in private practice settings in the U.S. [41], there are considerable benefits of buprenorphine treatment in public settings. Concerns about diversion may have thwarted promotion of buprenorphine among low-income patients, but increased access to treatment may reduce the use and trade of non-prescribed buprenorphine. Although methadone treatment has long been a successful, cost-effective treatment for opioid dependence, buprenorphine is an attractive alternate and supplemental treatment option. While we described buprenorphine as adequate for public sector settings, negative prescriber attitudes, a shortage of certified buprenorphine prescribers, and economic barriers such as high cost of the medication and lack of insurance coverage must first be addressed to increase access.

Examples of local and regional initiatives that have addressed these concerns include the inclusion of buprenorphine coverage in state Medicaid formularies, state level media campaigns to increase physician and pharmacy awareness and adoption of buprenorphine [41,68], and prescriber support networks that partner with experienced prescribers for consultation. Such networks have been linked to the high rate of buprenorphine utilization in public clinics that have participated in federally funded clinical trials in which professional support was a feature of the study design [69-71].

The relationship and the association between diversion and adherence to buprenorphine treatment or positive treatment recoveries is a complicated one that does not always determine successful buprenorphine maintenance treatment and therefore should not be a barrier to implementation into public hospital settings.

As opioid use continues to be a public health concern in the U.S.,



buprenorphine treatment options need to be expanded in public sector settings. In particular, public sector physicians should be supported through professional buprenorphine mentoring networks, and encouraged to prescribe buprenorphine with higher insurance reimbursements as well as local institutional incentives for public clinic doctors to prescribe. Reimbursement incentives are justifiable on the grounds that buprenorphine allows for cost effective integrated care for a population with high levels of comorbidity and hospital readmission rates. Prescriber fears of diversion should be assuaged with data about the decrease of buprenorphine diversion when access to medically supervised buprenorphine is increased. Finally, potential buprenorphine patients should be provided with information about buprenorphine's reduction of relapse rates, the advantages of office based buprenorphine for treatment of comorbidities, and the reports of prior buprenorphine patients that find buprenorphine treatment administratively flexible and less burdened with stigma.

Acknowledgements

We wish to acknowledge the crucial assistance of John Rotrosen M.D., Mary E. Skinner B.A, and Babak Tofighi M.D., at New York University, in conceptualizing this work. Support for this work was provided by a National Institutes of Health (NIH) grant DA 032674032674.

References

- Sullivan LE, Chawarski M, O'Connor PG, Schottenfeld RS, Fiellin DA (2005) The practice of office-based buprenorphine treatment of opioid dependence: is it associated with new patients entering into treatment? *Drug Alcohol Depen* 79: 113-116.
- Roman PM, Ducharme LJ, Knudsen HK (2006) Patterns of organization and management in private and public substance abuse treatment programs. *J Subst Abuse Treat* 31: 235-243.
- Fiellin D (2007) The First Three Years of Buprenorphine in the United States: Experience to Date and Future Direction. *J Addict Med* 1: 62-67.
- Barry DT, Irwin KS, Jones ES, Becker WC, Tetrault JM et al. (2010) Opioids, Chronic Pain, and Addiction in Primary Care. *J Pain* 11: 1442-1450.
- Turner L, Kruszewski SP, Alexander GC (2013) Trends in the Use of Buprenorphine by Office-Based Physicians in the United States, 2003-2013. *Am J Addict* 24: 24-29.
- Stancliff S, Joseph H, Fong C, Furst T, Corner SD et al. (2012) Opioid maintenance treatment as harm reduction tool for opioid-dependent individuals in New York City: the need to expand access to buprenorphine/naloxone in marginalized populations. *J Addict Dis* 31: 278-287.
- Stanton A, McLeod C, Luckey B, Kissin WB, Sonnefeld LJ (2006) SAMHSA/CSAT evaluation of the buprenorphine waiver program: expanding treatment of opioid dependence: initial physician and patient experiences with the adoption of buprenorphine. *Substance Abuse and Mental Health Services Administration*. May 5, 2006.
- Magura S, Lee SJ, Salsitz EA, Kolodny A, Whitley SD, et al. (2007) Outcomes of Buprenorphine Maintenance in Office-Based Practice. *J Addict Dis* 26: 13-23.
- Kissin W, McLeod C, Sonnefeld J, Stanton A (2006) Experiences of qualified addiction specialists who have and have not prescribed buprenorphine for opioid dependence. *J Addict Dis* 25: 91-103.
- Andrews CM, D'Aunno TA, Pollack HA, Friedmann PD (2014) Adoption of Evidence-Based Clinical Innovations: The Case of Buprenorphine Use by Opioid Treatment Programs. *Med Care Res Rev* 71: 43-60.
- Hansen H, Siegel CE, Case BG, Bertolio DN, DiRocco D et al. (2013) Variation in use of buprenorphine and methadone treatment by racial, ethnic, and income characteristics of residential social areas in New York City. *J Behav Health Serv Res* 40: 367-377.
- Hansen H, Roberts S (2012) Two Tiers of Biomedicalization: Buprenorphine, Methadone and the Biopolitics of Addiction Stigma and Race. *Adv Med Soc* 14: 79-102.
- Casadonte P, Kolodner G, Horton T, McMurphy SM (2004) Community treatment programs take up buprenorphine. *Sci Pract Perspect* 2: 24-29.
- Larance B, Carragher N, Mattick RP, Lintzeris N, Ali R, et al. (2014) A latent class analysis of self-reported clinical indicators of psychosocial stability and adherence among opioid substitution therapy patients: Do stable patients receive more unsupervised doses? *Drug Alcohol Depen* 124: 46-55.
- Stein BD, Gordon AJ, Dick AW, Burns RM, Pacula RL, et al. (2015) Supply of buprenorphine waived physicians: the influence of state policies. *J Subst Abuse Treat* 48: 104-111.
- Mattick RP, Breen C, Kimber J, Davoli M (2014) Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev* 2
- Miotto K, Hillhouse M, Donovick R, Cunningham-Rathner J, Charuvastra C et al. (2012) Comparison of Buprenorphine Treatment for Opioid Dependence in 3 Settings. *J Addict Med* 6: 68-76.
- Bauer GR (2014) Incorporating intersectionality theory into population health research methodology: Challenges and the potential to advance health equity. *Soc Sci and Med* 110: 10-17.
- Williams DR, Mohammed SA, Leavell J, Collins C (2010) Race, economic status, and health: complexities, ongoing challenges, and research opportunities. *Ann N Y Acad Sci* 1186: 69-101.
- Rosenblatt RA, Andrilla HA, Catlin M, Larson EH (2015) Geographic and Specialty Distribution of US physicians Trained to Treat Opioid Use Disorder. *Ann Fam Med* 13: 23-26.
- Thomas CP, Reif S, Haq S, Wallack SS, Hoyt A et al. (2008) Use of buprenorphine for addiction treatment: perspectives of addiction specialists and general psychiatrists. *Psychiatr Serv* 59: 909-916.
- Barry DT, Irwin KS, Jones ES, Becker WC, Tetrault JM et al. (2009) Integrating buprenorphine treatment into office-based practice: a qualitative study. *J Gen Intern Med* 24: 218-225.
- Hutchinson E, Catlin M, Andrilla CH, Baldwin LM, Rosenblatt RA (2014) Barriers to primary care physicians prescribing buprenorphine. *Ann Fam Med* 12: 128-133.
- Walley AY, Alperen JK, Cheng DM, Botticelli M, Castro-Donlan C et al. (2008) Office-based management of opioid dependence with buprenorphine: clinical practices and barriers. *J Gen Intern Med* 23: 1393-1398.
- Johnson TP, Booth AL, Johnson P (2005) Physician beliefs about substance misuse and its treatment: findings from a U.S. survey of primary care practitioners. *Subst Use Misuse* 40: 1071-1084.
- DeFlavio JR, Rolin SA, Nordstrom BR, Kazal LA Jr (2015) Analysis of barriers to adoption of buprenorphine maintenance therapy by family physicians. *Rural Remote Health* 15: 3019.
- Merrill JO, Rhodes LA, Deyo RA, Marlatt GA, Bradley KA (2002) Mutual mistrust in the medical care of drug users: the keys to the "narc" cabinet. *J Gen Intern Med* 17: 327-333.
- Krull I, Lundgren L, de Saxe Zerden L (2011) Attitudes toward evidence-based pharmacological treatments among community-based addiction treatment programs targeting vulnerable patient groups. *J Addict Dis* 30: 323-333.
- Turner BJ, Laine C, Lin T, Lynch K (2005) Barriers and facilitators to primary care or human immunodeficiency virus clinics providing methadone or buprenorphine for the management of opioid dependence. *Arch Intern Med* 165: 1769-1776.

30. Cunningham CO, Sohler NL, McCoy K, Kunins HV (2006) Attending physicians' and residents' attitudes and beliefs about prescribing buprenorphine at an urban teaching hospital. *Fam Med* 38: 336-340.
31. Murphy SM, Fishman PA, McPherson S, Dyck DG, Roll JR (2014) Determinants of buprenorphine treatment for opioid dependence. *J Subst Abuse Treat* 46: 315-319.
32. Fared A, Eilender P, Ketchen B, Buchanan-Cummings AM, Scheinberg K, et al. (2014) Factors affecting noncompliance with buprenorphine maintenance treatment. *J Addict Med* 8: 345-350.
33. Pelissier-Alicot AL, Sastre C, Baillif-Couniou V, Gaulier JM, Kintz P, et al. (2010) Buprenorphine-related deaths: Unusual forensic situations. *Int J Legal Med* 124: 647-651.
34. Sansone RA, Sansone LA (2015) Buprenorphine treatment for narcotic addiction: not without risks. *Innov Clin Neurosci* 12: 32-36.
35. Jones CM, Logan J, Gladden RM, Bohm MK (2015) Vital Signs: Demographic and substance abuse trends among heroin users – United States, 2002-2013. *CDC MMWR* 64: 719-725.
36. Daniulaityte R, Falck R, Carlson RG (2012) Illicit use of buprenorphine in a community sample of young adult non-medical users of pharmaceutical opioids. *Drug Alcohol Depen* 122: 201- 207.
37. Lofwall MR, Havens JR (2012) Inability to access buprenorphine treatment as a risk factor for using diverted buprenorphine. *Drug Alcohol Depen* 126: 379-383.
38. Mitchell SG, Kelly SM, Brown BS, Schacht Reisinger H, Peterson JA et al. (2009) Uses of diverted methadone and buprenorphine by opioid-addicted individuals in Baltimore, Maryland. *Am J Addict* 18: 346-355.
39. Johnson B, Richert T (2015) Diversion of methadone and buprenorphine from opioid substitution treatment: The importance of patients' attitudes and norms. *J Subst Abuse Treat* 54: 50-55.
40. Alford DP, LaBelle CT, Kretsch N, Bergeron A, Winter M, et al. (2011) Collaborative care of opioid-addicted patients in primary care using buprenorphine: five-year experience. *Arch Intern Med* 171: 425-431.
41. Ducharme, LJ, Abraham, AJ (2008) State policy influence on the early diffusion of buprenorphine in community treatment programs. *Subst Abuse Treat Preve Policy* 3: 17.
42. Barnett PG (2009) Comparison of costs and utilization among buprenorphine and methadone patients. *Addiction* 104: 982-992.
43. Horgan CM, Reif S, Hodgkin D, Garnick DW, Merrick EL (2008) Availability of addiction medications in private health plans. *J Subst Abuse Treat* 34: 147-156.
44. Stein BD, Gordon AJ, Sorbero M, Dick AW, Schuster J, et al. (2012) The impact of buprenorphine on treatment of opioid dependence in a Medicaid population: recent service utilization trends in the use of buprenorphine and methadone. *Drug Alcohol Depen* 123: 72-88.
45. Clark RE, Samnallev M, Baxter JD, Leung GY (2011) The evidence doesn't justify steps by state Medicaid programs to restrict opioid addiction treatment with buprenorphine. *Health Aff* 30: 1425-1433.
46. Fiellin DA, Pantalon MV, Pakes JP, O'Connor PG, Chawarski M, et al. (2002) Treatment of heroin dependence with buprenorphine in primary care. *Am J Drug Alcohol Abuse* 28: 231-241.
47. Soeffing JM, Martin LD, Fingerhood MI, Jasinski DR, Rastegar DA (2009) Buprenorphine maintenance treatment in a primary care setting: outcomes at 1 year. *J Subst Abuse Treat* 37: 426-430.
48. Gray A (2007) Systemic review of the safety of buprenorphine, methadone and naloxone. *The World Health Organization* 17-21.
49. Barry DT, Moore BA, Pantalon MV, Chawarski MC, Sullivan LE, et al. (2007) Patient satisfaction with primary care office-based buprenorphine/naloxone treatment. *J Gen Intern Med* 22: 242-245.
50. Fiellin DA, Pantalon MV, Chawarski MC, Moore BA, Sullivan LE, et al. (2006) Counseling plus buprenorphine-naloxone maintenance therapy for opioid dependence. *N Engl J Med* 355: 365-374.
51. Fared A, Vayalappalli S, Casarella J, Drexler K (2012) Treatment outcome for flexible dosing buprenorphine maintenance treatment. *Am J Drug Alcohol Abuse* 38: 155-160.
52. Lee JD, Grossman E, DiRocco D, Gourevitch MN (2008) Home buprenorphine/naloxone induction in primary care. *J Gen Intern Med* 24: 226-232.
53. Sohler NL, Li X, Kunins HV, Sacaiju G, Giovanniello A, et al. (2012) Home-versus office-based buprenorphine inductions for opioid-dependent patients. *J Subst Abuse Treat* 38: 153-159.
54. Wang EA, Moore BA, Sullivan LE, Fiellin DA (2010) Effect of incarceration history on outcomes of primary care office-based buprenorphine/naloxone. *J Gen Intern Med* 25: 670-674.
55. Lee JD, Grossman E, Truncali A, Rotrosen J, Rosenblum A, et al. (2012) Buprenorphine-naloxone maintenance following release from jail. *Subst Abuse* 33: 40-47.
56. Magura S, Lee JD, Hershberger J, Joseph H, Marsch L, et al. (2009) Buprenorphine and methadone maintenance in jail and post-release: a randomized clinical trial. *Drug Alcohol Depen* 99: 222-230.
57. Hersh D, Little SL, Gleghorn A (2011) Integrating buprenorphine treatment into a public healthcare system: the San Francisco Department of Public Health's office-based buprenorphine pilot program. *J Psychoactive Drugs* 43: 136-145.
58. Rowe TA, Jacapraro JS, Rastegar DA (2012) Entry into primary care-based buprenorphine treatment is associated with identification and treatment of other chronic medical problem. *Addict Sci Clin Pract* 7: 22.
59. Bonhomme J, Shim RS, Gooden R, Tyus D, Rust G (2012) Opioid addiction and abuse in primary care practice: a comparison of methadone and buprenorphine as treatment options. *J Natl Med Assoc* 104: 342-350.
60. Fiellin DA, Weiss L, Botsko M, Egan JE, Altice FL, et al. (2011) Drug treatment outcomes among HIV infected opioid-dependent patients receiving buprenorphine/naloxone. *J Acquir Immune Defic Syndr* 56: S33-S38.
61. Altice FL, Bruce RD, Lucas GM, Lum PJ, Korthuis PT, et al. (2011) HIV treatment outcomes among HIV-infected opioid dependent patients receiving buprenorphine/naloxone treatment within HIV clinical care settings: results from a multisite study. *J Acquir Immune Defic Syndr* 56: S22-S32.
62. Altice FL, Sullivan LE, Smith-Rohrberg D, Basu S, Stancliff S, et al. (2006) The potential role of buprenorphine in the treatment of opioid dependence in HIV-infected individuals and in HIV infection prevention. *Clin Infect Dis* 43: S178-S183.
63. Korthuis PT, Gregg J, Rogers WE, McCarty D, Nicolaidis C, et al. (2010) Patients' reasons for choosing office-based buprenorphine: preference for patient-centered care. *J Addict Med* 4: 204-210.
64. Cunningham CO, Drucker E, Meissner P, McCoy K, Selwyn PA (2005) The perceived need for buprenorphine treatment at a primary care clinic in the South Bronx: a market survey. *Addict Disord Their Treat* 4: 125-126.
65. Mitchell SG, Kelly SM, Gryczynski J, Myers CP, Jaffe JH, et al. (2012) African American patients seeking treatment in the public sector: characteristics of buprenorphine vs. methadone patients. *Drug Alcohol Depen* 122: 55-60.
66. Schomerus G, Lucht M, Holzinger A, Marschinger H, Carta MG, et al. (2011) The stigma of alcohol dependence compared with other mental disorders: a review of population studies. *Alcohol Alcohol* 46: 105-112.
67. Kim TW, Samet JH, Cheng DM, Winter MR, Safran DG, et al. (2007) Primary care quality and addiction severity: a prospective cohort study. *Health Serv Res* 42: 755-772.
68. (2009) State Health Department Launches Media Campaign to Increase Public Awareness about Prescription Opioid Addiction. New York State Department of Health.



69. Ling, W., Jacobs P, Hillhouse M, Hasson A, Thomas C, et al. (2010) From research to the real world: buprenorphine in the decade of the Clinical Trials Network. *J Subst Abuse Treat* 38: S53-S60.
70. Kunins HV, Sohler NL, Giovanniello A, Thompson D, Cunningham CO (2013) A buprenorphine education and training program for primary care residents: Implementation and evaluation. *Subst Abus* 34: 242-247.
71. Netherland J, Botsko M, Egan JE, Saxon AJ, Cunningham CO, et al. (2009) Factors affecting willingness to provider buprenorphine treatment. *J Subst Abuse Treat* 36: 244-251.

Copyright: © 2015 Duncan LG, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Citation: Duncan LG, Mendoza S, Hansen H (2015) Buprenorphine Maintenance for Opioid Dependence in Public Sector Healthcare: Benefits and Barriers. *J Addict Med Ther Sci* 1(2): 031-036. DOI: 10.17352/2455-3484.000008