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# HIV, Alcohol Dependence and the Criminal Justice System: A Review and Call for Evidence-Based Treatment

**Sandra A. Springer, MD**, **Marwan M. Azar, MD**, and **Frederick L. Altice, MD**
Yale University AIDS Program

## Abstract

People with both HIV and alcohol use disorders are disproportionately concentrated within the U.S. criminal justice system; approximately one-quarter of all people with HIV cycle through the system each year. HIV-infected prisoners with alcohol problems face many obstacles as they transition back to the community. Specifically, although they have impressive HIV treatment outcomes during the period of incarceration while they are free from alcohol, upon release, however, they face inordinate challenges including relapse to alcohol use resulting in significant morbidity and mortality. Randomized controlled trials affirm the role of pharmacotherapy using naltrexone (NTX) as the therapeutic option conferring the best treatment outcome for alcohol use disorders within the community. Absent from these trials were inclusion of prisoners or HIV-infected individuals. Relapse to alcohol use among HIV-infected prisoners is associated with reduced retention in care, poor adherence to antiretroviral therapy with consequential poor HIV treatment outcomes and higher levels of HIV risk behaviors. Untreated alcohol dependence, particularly for released HIV-infected prisoners, has both negative consequences for the individual and society and requires a concentrated effort and rethinking of our existing approaches for this vulnerable population. The specific aim of this manuscript is to review the existing literature regarding the relationship of HIV and treatment for alcohol use disorders in criminal justice populations in an effort to determine “best practices” that might effectively result in improved treatment of HIV and alcohol disorders for released prisoners.

### Keywords

Alcohol Abuse; Alcohol Dependence; Naltrexone; Acamprosate; HIV; AIDS; prisoners; incarceration; prevention

## Introduction

Incarceration in the U.S. has reached epidemic proportions, now with one in every 100 citizens behind bars.[1] Inmates in correctional facilities bear a greater burden of chronic viral infections (HIV, HBV, HCV), tuberculosis, substance use disorders, mental illness, and sexually transmitted diseases than those in community settings.[2] Compared to the general population, HIV is concentrated three-fold and AIDS is fourfold higher within prisons.[3] Though estimates range from between 14%[4] and 26%,[2] a significant proportion of all HIV-infected persons in the U.S. circulate through the criminal justice system each year. Despite demonstrated successes with improving HIV treatment outcomes,[5, 6] and decreasing morbidity and mortality[7] within prison, upon release from prison transitional programs have only been somewhat effective at continuing the benefit of HIV treatment after release

Contact: Sandra A. Springer, M.D., Address: Yale AIDS Program, 135 College Street, Suite 323, New Haven, CT 06510, Phone: 203-737-5530, Fax: 203-737-4051, Sandra.springer@yale.edu.

through assistance with follow-up community appointments but have not yet shown they can maintain HIV treatment outcomes (suppressed HIV RNA levels, high CD4 counts) that were achieved while incarcerated.[8] Many potential explanations are posited for these poor outcomes: relapse to drug and alcohol use,[9–12] low prescription refill rates,[13] and unstable living circumstances and poorly treated mental illness.[8, 14]

The dramatic growth in the inmate population over the last twenty-five years has resulted from the increased criminalization of drug use, specifically on increased arrests and incarceration for drug- and alcohol-related offenses and minimum mandatory sentencing for them.[1,15] Furthermore, relapse to drug and alcohol use soon after release from prison, contributes greatly to overdose, morbidity and death and to reincarceration.[16] Issues related to management of opioid dependence have been reviewed elsewhere.[17] Despite the magnitude of alcohol use disorders among prisoners and the availability of effective, evidence-based pharmacological treatments, they have not been integrated into the criminal justice system as relapse prevention among prisoners transitioning to the community. We therefore review the existing literature examining the relationship of HIV, alcohol dependence and treatment for alcohol use disorders in an effort to determine “best practices” that might effectively be adapted for use in the criminal justice system and therefore result in improved treatment of HIV and alcohol disorders for released prisoners.

## Methods

### Study Selection

For this manuscript, PubMed, PsychInfo and Medline were queried for relevant articles using the following MESH search terms: “HIV”, “AIDS”, “substance abuse”, “alcohol abuse”, “alcohol dependence”, “problem drinking”, “alcoholism”, “naltrexone”, “acamprosate”, “disulfiram“, “HIV risk behaviors”, “medication-assisted therapy”, “prisoner”, “incarceration”, “criminal justice system”, “antiretroviral therapy”, “adherence”, were used in multiple different combinations to generate search queries. References from identified articles were subsequently searched for additional relevant papers.

### Inclusion and Exclusion criteria

Publications were restricted to studies of the U.S. criminal justice system and published between 1990–2009 in English in peer-reviewed journals. The purpose of this review is to examine the interface between HIV-infected prisoners and the criminal justice system to examine the available and potentially beneficial treatments for alcohol use disorders. Thus, articles reporting on the relationship between HIV, alcohol dependence and treatments adapted to the prison system and to release from prison were included in the analysis.

## The Epidemic of Incarceration

The U.S. has the highest rate of incarceration world-wide such that over 2 million people are behind bars and 7.2 million are within the criminal justice system at any one time.[1] In 2006, 751 of every 100,000 persons were behind bars, indicating the country’s formidable social policy of imprisonment, primarily as a means to control alcohol and drug use, and the huge public health impact of prisoners’ health on communities at large.[18] The high prevalence of HIV among those with substance use disorders has resulted in concentration of HIV within the criminal justice system. Annually, 10 million people are released to the community from a correctional facility, oftentimes with undiagnosed or untreated medical conditions such as HIV/AIDS.[2]

## Substance Use Disorders Among Correctional Populations

In 2002 alone, almost 50% of jail inmates reported symptoms of alcohol abuse or dependence prior to incarceration,[15] and in 1997 almost 60% of state and federal prisoners reported drinking alcohol at the time of the committed offense.[19] In another study, it was similarly reported that over 40% of incarcerated persons were using alcohol at time of the committed offense, and 90% of those with alcohol dependence relapse to alcohol use within 1 month after release to the community.[9] Overall it has been reported that the lifetime incidence of problems with substance abuse or dependence for those who enter correctional settings approaches 85 percent.[11] In 1998, taxpayers spent $24 billion to incarcerate individuals for crimes related to substance misuse[20] – this amount has continued to increase.

In addition to alcohol dependence, long-term consequences of high levels of alcohol consumption are associated with an increased risk of developing cardiovascular disease, malabsorption, pancreatitis, alcoholic liver disease, and cancer. Injuries and interpersonal violence are also problematic. Damage to the central nervous system and peripheral nervous system can occur from sustained alcohol consumption.[21, 22] Long-term use of alcohol in excessive quantities is capable of damaging nearly every organ and system in the body.[23] Alcohol use disorders are highly prevalent among prisoners[24] and are associated with increased sex risk-taking behaviors,[25, 26] decreased adherence to antiretroviral therapy,[27] decreased health care utilization,[28] acceleration in cognitive decline,[29] a higher prevalence of co-morbid mental illness[30] and an overall increased mortality. Released HIV-infected inmates who relapse to alcohol use are thus faced with exponentially poorer health outcomes.

Though incarceration itself can lead to adverse health consequences,[31] the criminal justice system does, however, provide a structured setting and opportunity for the implementation of health-promoting interventions, including strategies for treating HIV and alcohol use disorders. Integration of treatment for both conditions is likely to have a profound impact and improve health outcomes among some of the most medically and socially vulnerable Americans who suffer from considerable health care disparities.

## Re-entry of HIV-Infected Prisoners to the Community

Since the widespread introduction of highly active antiretroviral therapy (HAART) nationally and the introduction of chemoprophylaxis of opportunistic infections (OIs), mortality among prisoners has markedly decreased[7] and HIV/AIDS is no longer the leading cause of prison-related death nationally.[32] Excellent adherence to HAART suppresses HIV viral load and increases CD4 cells, thereby keeping HIV-infected persons healthy and free from complications from HIV and non-HIV–associated complications.[33, 34] Carefully conducted studies in Connecticut and North Carolina have confirmed the benefit of HAART during the period of incarceration where HIV-1 RNA and CD4 counts improved.[5, 6] While on supervised treatment within Connecticut prisons and free from alcohol and drugs, CD4 lymphocyte counts increased and HIV-1 RNA levels decreased significantly in 1044 prisoners, such that 59% of subjects achieved a non-detectable viral load prior to community release.[35] Despite these intra-prison successes, dismal HIV treatment outcomes were noted during the 3-month vulnerable period after release from prison. Moreover, nearly a third of subjects were reincarcerated within 12 months despite the availability of transitional case management and universal access to public entitlements that ensured continuity of antiretroviral therapy.[5] Similar findings were subsequently reported in North Carolina in a smaller study of 45 patients.[6] Historically, HIV treatment outcomes within the Texas prison system demonstrated decreased mortality,[36] yet after release, only 5% of released HIV-infected prisoners accessed free antiretroviral prescription medication within the 10 days

after release during with medications were provided.[13] Multiple explanations for poor rates of prescription refills exist, including poor access to participating pharmacies, and relapse to alcohol and drugs, potentially rendering health care and prescription refills as less important post-release priorities.

Prior to incarceration, prisoners with and without HIV report high levels of sexual and substance related HIV risk sexual behaviors. [37] Such behaviors, though at markedly reduced levels, continue within correctional facilities.[38] Several studies to date confirm the high degree of unprotected sexual activity among released HIV-infected prisoners.[39] Furthermore, released prisoners who drink alcohol heavily are more likely than those who don't to engage in high risk unprotected sexual activity,[40] and knowingly with HIV-seronegative partners.[37]

Intervening with this population therefore has significant public health implications that exceed those when intervening with HIV undifferentiated patients because HIV-infected persons are the only ones who can transmit infection.[41] The unprecedented pace of community-release for HIV-infected inmates requires new and invigorated efforts to ensure a smooth transition to the community.[42] Without such efforts, continuity of care for HIV and other co-morbid conditions will result in further expansion of the HIV epidemic and adverse clinical, social and criminal justice outcomes for the individual.[31]

## Impact of Alcohol on HIV-Infected Individuals

Active alcohol and drug use has been associated with decreased access to and utilization of health services. In the HIV/AIDS Treatment Adherence, Health Outcomes, and Cost Study from 8 U.S. sites, health care utilization was examined for substance abuse and mental health services for people living with HIV/AIDS. Of those meeting DSM-IV criteria for alcohol or drug use disorders, only 15% received substance abuse treatment services while only 26% received services for mental health. Subjects who were alcohol-dependent but not drug-dependent were significantly less likely to receive any kind of service.[43] In another study of 610 HIV-infected medically marginalized persons in New York, problematic drinking was associated with a 1.46-fold increased risk of emergency department utilization – a well-established proxy for poor retention in primary care.[44] Furthermore it is well known that alcohol itself likely contributes to morbidity and mortality in HCV-infected patients due to effect on adherence to medical appointments as well as administration of medications.[45]

Heavy alcohol use has been associated with poor adherence to antiretroviral therapy for HIV-infected persons,[46] as well as resulting in increased HIV-risk taking behaviors. [47, 48] Problem drinking has also been associated with a decreased likelihood of suppressing HIV viral load to non-detectable levels when compared to those who do not use alcohol.[49] Numerous studies document the impact of active alcohol and drug use on HIV treatment outcomes. These justify the need for more effective alcohol treatment modalities in HIV-infected patients. Last, recurrent alcohol use may result in increased toxicity, including alcohol-induced hepatic injury that may be compounded by concurrent treatment with antiretroviral medications. Thus, problematic drinking results in either excess toxicity or potential to result in discontinuation of treatment due to the need to reduce ongoing liver damage.

Alcohol directly and indirectly accelerates liver disease in HIV-infected individuals both in terms of direct toxicity to the liver itself as well as the increased toxicity secondary to antiretroviral therapy. Moreover, 30% of HIV-infected patients are HCV co-infected and this number approaches 60% in the Northeast where injection drug use contributes significantly to HIV and HCV transmission.[50] Alcohol abuse and chronic HCV infection are

the two most common causes of end-stage liver disease (ESLD) and concomitant alcohol use is associated with hepatic steatosis[51] and accelerated progression to ESLD among HCV-infected individuals.[52] Aside from the impact of alcohol on progression of HCV to ESLD, HIV itself accelerates progression to ESLD with ESLD being the most common cause of death among HIV-infected patients in the U.S.[53, 54] Therefore not only does concurrent alcohol use accelerate hepatic fibrosis in chronic HIV-infected patients, it also decreases adherence to medical appointments and important HIV treatment that contributes to higher morbidity and mortality.

## Evidence-Based Treatment for Alcohol Dependence

Multiple treatment modalities, including behavioral and medication-assisted treatments, are available for the treatment of alcohol use disorders. Behavioral interventions, the mainstay of alcohol treatment for decades, have typically demonstrated a small to modest effect size in the treatment of alcohol disorders. Typically behavioral treatment of alcohol dependence falls in to 2 categories (1) Theory–based, that is well-described and often manual-supported, [i.e. Motivational Enhancement, cognitive behavioral therapy (CBT), international, well-structured psychodynamic therapy]; and (2) Self-help supportive treatment such as group and individual counseling and 12-step programs. Although self-help groups [e.g., Alcoholics Anonymous (AA)] are widely available in prisons (~74%), very few prisoners actually participate. For example, only 16% of Federal inmates with alcohol dependence participated in group counseling while incarcerated,[20] and this approach has never been demonstrated to reduce relapse to alcohol use or recidivism to prison after release to the community.[55,20] Motivational Enhancement Therapy (MET) uses motivational-based interventions that have been found to be effective when combined with pharmacotherapy.[56,57] The BRENDA counseling approach [56] was designed specifically for combination with pharmacotherapy (including extended release-naltrexone) for treatment of alcohol dependence.[58] It is less structured than CBT and does not have modules for family involvement, methods for social skills training or coping with craving.[59] CBT has been shown to be a modestly more effective psychosocial treatment for alcohol dependence compared to other modalities.[60] Individual CBT enhances pharmacotherapy (i.e., naltrexone, NTX) over group therapy as well as over Motivational Enhancement Therapy (MET).[61, 62] There has been a call for substance abuse treatment programs in correctional settings to be organized according to empirically supported approaches such as CBT.[63] A review of all studies that compared alcohol relapse outcomes from comparisons between treatment and no treatment in the Cochrane Database reported that in 16 of the studies reviewed, specific theory-based treatment, including CBT, was superior to self-help supportive treatments such as 12-step approaches.[64] Despite some improvement of AUDs with behavioral therapies, treatment for alcohol use using counseling alone has not been associated with improved adherence to antiretroviral medication or viral load suppression.[65]

To date, alcohol pharmacotherapy, with or without alcohol relapse prevention counseling, has been demonstrated as the most effective treatment for problem drinking and alcohol dependence. It has not, however, been systematically evaluated for treatment in HIV-infected persons nor has it been examined for use in released prisoners. Currently there are three FDA-approved pharmacotherapies for treatment of alcohol dependence: disulfiram, acamprosate and naltrexone.

*Disulfiram*, first proposed for treatment of alcoholism in 1937 by E.E. Williams, was approved for the treatment of alcohol dependence in 1951.[66] Its initial success was based on the principle of aversive conditioning – the notion that patients will avoid unpleasant adverse side effects when drinking. Disulfiram works by blocking the oxidation of alcohol, resulting in markedly elevated levels of acetaldehyde. Acetaldehyde accumulation that

occurs with simultaneous ingestion of disulfiram and alcohol produces unpleasant symptom, including flushing, headache, nausea, vomiting, sweating, chest pain, palpitations, and tachycardia. In rare cases, life-threatening reactions like hypotension, cardiovascular collapse, convulsions and death can occur.[67] Sustained benefits from disulfiram treatment have been thwarted by problems with adherence to a daily "avoidance" medication and its untoward consequences, including hepatotoxicity. In an attempt to improve adherence that would not depend upon patient motivation or legal stipulations (e.g., parole), an implantable formulation was formulated, but is not available within the U.S. Because there is no reinforcement for continued adherence to disulfiram, unlike the case with methadone where missing doses results in negative consequences (e.g., withdrawal symptoms), more recent controlled studies demonstrate that disulfiram treatment is similar to placebo.[68] Disulfiram treatment may have some benefit, however, where adherence is coercive (e.g., methadone maintenance, probation or parole) or among highly-motivated patients.[69]

Three non-controlled studies of offenders under community supervision suggest a benefit, while one does not. Among 132 probationers in Atlanta where disulfiram treatment was observed daily by either a family member or probation officer, 64 (50%) remained abstinent from alcohol over 3 months.[70] Similarly among 141 parolees receiving observed alternate-day dosing disulfiram in Colorado (Colorado Springs), 46% demonstrated a beneficial response by the end of one year.[71] Alternate-day dosing among 68 relapsing alcoholics in Elmhurst, New York resulted in 58% remaining abstinent over six months.[72] In the only study of disulfiram compared to group therapy, however, Gallant and colleagues were unable to replicate these results among probationers where drinking was improved by only 10%.[73] While the data are limited, there is some evidence to suggest that disulfiram may be beneficial in some circumstances, however, its benefit is significantly amplified by the legal sanctions associated with being under community supervision.

*Acamprosate*, a structural analogue of the GABA neurotransmitter whose mechanism of action is not completely understood, has been available since 2004 for the treatment of alcohol dependence.[74] Acamprosate is believed to exert its action by through GABA receptors and may also attenuate the effect of glutamate at NMDA-type receptors. The cumulative effect results in restoration of a balance between neuronal excitation and inhibition in the central nervous system that is hypothesized to be altered in chronic alcoholics and plays a role in relapse. [74, 75,76] Sixteen controlled trials with more than 4500 subjects have demonstrated a modest advantage over placebo in maintaining abstinence from alcohol.[77] More recently, however, the COMBINE study, a large multi-center RCT of 1383 subjects, comparing naltrexone, acamprosate and a combined behavioral intervention (CBT) did not confirm any benefit of acamprosate compared to placebo. Indeed, in this study, oral NTX therapy alone or in combination with CBT was superior to acamprosate, CBT without a pharmacotherapy or when combined with acamprosate.[78] NTX alone was found to have a higher percent of days abstinent from alcohol and reduced risk of time to first heavy drinking day.[79] Data from this multi-arm study among those with alcohol dependence confirm the superiority of NTX compared to other pharmacotherapies and counseling-based treatments.

Adherence to pharmacotherapies has limited the effectiveness of most treatments. For example, Acamprosate treatment requires taking two capsules three times daily. This may, in part, explain the poor performance by acamprosate in the Combine Study. Furthermore, the increased pill burden of acamprosate, compared to Naltrexone and Disulfiram, adversely impacts adherence. Methods to improve adherence in this population will be necessary to improve clinical outcomes.

*Naltrexone (NTX)* is thought to prevent relapse to alcohol use by attenuating the pleasure-response associated with return to drinking, thereby decreasing the reinforcement associated with that behavior.[80, 81] Specifically, ethanol appears to activate the endogenous opioid system that results in an activation of various neurotransmitters, such as dopamine. This pleasurable cycle, associated with the mesolimbic reward pathway, constitutes the reinforcing effects of ethanol.[82,83] Interruption of this cycle using NTX results in a decrease in heavy drinking as well as a prolongation of abstinence.[84,85,86]

Similar to disulfiram, and possibly acamprosate, poor adherence to oral NTX therapy decreases treatment ineffectiveness. To address problematic adherence with NTX, an injectable formulation was developed that provides therapeutic doses of NTX over a 30-day period.[87] The injectable, extended release formulation has not been evaluated in correctional settings, but its potential to decrease relapse to both alcohol and opioids when administered prior to release from correctional settings is an important area for future research.

The extended release formulation of naltrexone (NTX-ER) is an extended-release microsphere formulation of naltrexone administered by intramuscular (IM) gluteal injection every 4 weeks or once a month. The naltrexone plasma concentration peaks 2 hours after an IM injection, followed by a second peak 2–3 days later. Compared to daily oral dosing with naltrexone 50mg over 28 days, total naltrexone exposure is 3–4 fold higher following administration of a single dose of NTX-ER 380mg. Steady state is reached at the end of the dosing interval following the first injection. The cytochrome P450 system is not involved in naltrexone metabolism. Naltrexone and its metabolites are conjugated to form glucuronidated metabolites. Therefore, there are no likely drug interactions between medications involved in the treatment of HIV. [88] Elimination of naltrexone and its metabolites occurs primarily via urine, with minimal excretion of unchanged naltrexone. In terms of how hepatic impairment effects the pharmacokinetics of NTX-ER, there was no change in subjects with mild to moderate hepatic impairment Child- Pugh classification Groups A and B, therefore dose adjustment is not necessary.[89]

Although no studies have evaluated the safety of NTX in HIV-infected persons, there have been a few studies of NTX to treat alcohol use disorders in HCV-infected populations showing that it can decrease alcohol craving and use, opioid craving and use, and HCV viral replication in HCV-infected opioid dependent users and not be hepatotoxic.[90] In one Australian community outpatient clinic, over 850 Injection Drug Users (IDUs) were treated with NTX implants effective for 4–6 months subcutaneously to treat opioid dependence. In one study from this cohort of patients, 28% of IDUs reported heavy alcohol use prior to implantation and at the end of 6 months all decreased heavy alcohol intake to <70g/week in conjunction with utilizing a brief counseling intervention supported by the World Health Organization (WHO). No adverse hepatotoxicity was found noted on laboratory testing. Though there are no clinical case series, NTX was safely administered to one HCV-infected man with alcohol dependence who received a liver transplant.[91, 92] In summary, there have been no reported cases of liver failure in NTX treated patients, including those with cholestatic pruritis.[93]

## Suggestions For Implementing Alcohol Preventive Treatment Prior to Discharge for Criminal Justice Populations

The correctional system provides real opportunities for the dual treatment of HIV infection and alcohol use disorders. Beyond the treatment of alcoholism, interventions for alcohol dependence including pharmacotherapy or psychotherapy have the potential to decrease the spread of HIV and to significantly improve HIV health outcomes. Despite the criminal justice system being an ideal site for the implementation of evidence-based pharmacological

treatment for substance use disorders as part of transitional care, there is little evidence that such services are being provided. Potential barriers to implementing NTX-ER within the criminal justice system include: 1) cost ($700 per monthly injection), especially in the setting of constrained state governments; 2) lack of experience with medication-assisted treatments for substance use disorders;[94] 3) insufficient infrastructure within community settings to continue NTX-ER; and 4) loss of public entitlements for individuals who are incarcerated.[95]

In the case of prisoners with alcohol use disorders and HIV, the stakes are higher due to the negative consequences of alcohol itself and its influence on antiretroviral medication adherence, retention in care and on HIV risk-taking behaviors. To date, however, alcohol pharmacotherapy with or without alcohol relapse prevention counseling for HIV-infected persons with alcohol use disorders has not been evaluated. Despite the significant degree of alcohol problems among those involved in the criminal justice system, as well as a significant amount of co-morbid HIV infection, little has been done to implement medication-assisted treatment to prevent relapse to substance use for this population that is transitioning to the community.

In 1997, only 1 in 8 State prisoners and 1 in 10 Federal prisoners reported that they had participated in drug and alcohol treatment programs since entering prison.[19] Some of the identified barriers to treatment of alcohol and drug dependency in prisons have been identified as: (1) budgetary constraints; (2) space limitations; (3) limited number of counselors; (4) frequent movement of inmates; (5) legislative barriers; and most importantly, (6) ***problems with aftercare provision***.[96] Despite numerous guidelines developed to improve identification and treatment of substance disorders in prison as well as upon release,[97, 98] few correctional and community linkages have been established to effectively implement these guidelines.[99]

There is a significant opportunity for the criminal justice system (CJS) to develop and implement evidence-based interventions that target behavioral change.[100] Unfortunately, there are few evidence-based interventions for treatment of substance use disorders that are either behavioral or pharmacological that target secondary HIV prevention for released prisoners.[100] For instance, some secondary HIV prevention efforts have been modestly successful when linked to case management of released prisoners, [101] but pharmacological efforts to prevent relapse to substance use are profoundly lacking.[17] A recent pilot study, however, has provided some promise by utilizing medication assisted treatment (MAT) for released HIV-infected opioid dependent prisoners in Connecticut in the form of buprenorphine/naloxone.[102] This treatment was highly successful in regards to safety and tolerability, as well as in reductions in craving for opioids, preventing relapse to opioid use, and retaining HIV treatment outcomes. Such MAT interventions are beginning to emerge within the CJS due to the escalating costs of incarceration and the need to reduce recidivism, especially among those with substance use disorders.

Research efforts to explore effective treatments for alcohol and drug dependence in the CJS are invigorated by new funding from the National Institutes on Health. In the case of alcohol, the National Institutes on Alcohol Abuse and Alcoholism recently funded a 5-year placebo-controlled trial the use of NTX-ER among HIV-infected prisoners with alcohol use disorders who are transitioning to the community (R01 AA018944-01, Springer & Altice, (WWW.CLINICALTRIALS.GOV; NCT01077310).

New data from Russia using NTX-ER confirm its superiority over placebo in treating opioid dependence.[103] Though NTX itself is approved for the treatment of opioid dependence, yet relatively ineffective using the oral formulation, the new NTX-ER formulation holds great

promise for the treatment of opioid dependence in released HIV-infected prisoners, but requires empiric testing. Such research will assist the CJS administrators and policy makers in determining whether starting NTX-ER pharmacotherapy for the treatment of alcohol or opioid dependence prior to release is not only cost-effective, but also beneficial to the individual and public health.

## Conclusions

There are limitations to this review. While an exhaustive search of the literature was performed, there is no guarantee that all relevant articles were found. In addition, we did not adhere to a systematic method of critical appraisal and conducted a narrative review. This approach was used as the literature is sparse in this area and we wanted to draw from all possible sources. Though there are no new findings, this manuscript is the only one that highlights an overlooked area of investigation and will hopefully stimulate new investigative inquiries, especially in rethinking available strategies for co-managing HIV and alcohol use disorders within the broader health care system.

Despite these limitations, the CJS represents an important place to adapt and effectively implement evidence-based interventions for HIV-infected prisoners transitioning to the community, particularly those with alcohol problems. This would be true not only for individuals in closed settings (e.g., prisons and jails), but among those on probation, parole or who face options for alternatives to incarceration. Among the most effective strategies for reducing the harm from alcohol in HIV-uninfected patients, NTX-ER appears to have considerable promise.

It is now time to introduce and examine the safety and efficacy of evidence-based pharmacological therapy for this particularly vulnerable population. If determined to be safe and effective, these medication-assisted therapies have the potential to improve health outcomes, including HIV treatment outcomes, reducing HIV risk behaviors and reducing the direct harm from alcohol use itself. The use of NTX-ER has the added potential to improve adherence to medication-assisted therapy and potentiate the gains from this effective therapy.

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## References

1. The Pew Center on the States. One in 100: Behind Bars in America. Washington, D.C: The Pew Charitable Trusts; February 28. 2008
2. Hammett TM, Harmon MP, Rhodes W. The burden of infectious disease among inmates of and releasees from US correctional facilities, 1997. Am J Public Health. 2002; 92(11):1789–1794. [PubMed: 12406810]
3. Maruschak, L.; Beavers, R. HIV in Prisons, 2007–08. Washington, D.C: U.S. Department of Justice, Office of Justice Programs; 2009.
4. Spaulding AC, Seals RM, Page MJ, Brzozowski AK, Rhodes W, Hammett TM. HIV/AIDS among inmates of and releasees from US correctional facilities, 2006: declining share of epidemic but persistent public health opportunity. PLoS ONE. 2009; 4(11):e7558. [PubMed: 19907649]

5. Springer SA, Pesanti E, Hodges J, Macura T, Doros G, Altice FL. Effectiveness of antiretroviral therapy among HIV-infected prisoners: reincarceration and the lack of sustained benefit after release to the community. Clin Infect Dis. 2004; 38(12):1754–1760. [PubMed: 15227623]
6. Stephenson BL, Wohl DA, Golin CE, Tien HC, Stewart P, Kaplan AH. Effect of release from prison and re-incarceration on the viral loads of HIV-infected individuals. Public Health Rep. Jan–Feb; 2005 120(1):84–88. [PubMed: 15736336]
7. Centers for Disease Control (CDC). Decrease in AIDS-related mortality in a state correctional system--New York, 1995–1998. Mmwr. Jan 8; 1999 47(51–52):1115–1117. [PubMed: 9921729]
8. Springer, S.; Altice, F. Improving the Care for HIV-Infected Prisoners: An Integrated Prison-Release Health Model. In: Greifinger, R., editor. Public Health Behind Bars: From Prisons to Communities. Springer Science; 2007.
9. Kinlock TW, Battjes RJ, Schwartz RP. A novel opioid maintenance program for prisoners: preliminary findings. J Subst Abuse Treat. 2002; 22(3):141–147. [PubMed: 12039617]
10. Levasseur L, Marzo J, Ross N, Blatier C. Frequency of re-incarcerations in the same detention center: role of substitution therapy. A preliminary retrospective analysis. Annal Med Interne. 2002; 153(3 Suppl):1S14–19.
11. Peters RH, Greenbaum PE, Edens JF, Carter CR, Ortiz MM. Prevalence of DSM-IV substance abuse and dependence disorders among prison inmates. Am J Drug Alcohol Abuse. Nov; 1998 24(4):573–587. [PubMed: 9849769]
12. Chandler RK, Fletcher BW, Volkow ND. Treating drug abuse and addiction in the criminal justice system: improving public health and safety. JAMA. Jan 14; 2009 301(2):183–190. [PubMed: 19141766]
13. Baillargeon J, Giordano TP, Rich JD, et al. Accessing antiretroviral therapy following release from prison. JAMA. Feb 25; 2009 301(8):848–857. [PubMed: 19244192]
14. Altice, F.; Khoshnood, K. Transitional Case Management as a strategy for Linking HIV-Infected prisoenrs to community health and social services ( Project TLC). Connecticut Department of Public Heath; 1997.
15. Karberg, J.; James, D. Substance Dependence, Abuse, and Treatment of Jail Inmates, 2002. Washington, D.C: 2005. NCJ 209588
16. Binswanger IA, Stern MF, Deyo RA, et al. Release from prison--a high risk of death for former inmates. N Engl J Med. 2007; 356(2):157–165. [PubMed: 17215533]
17. Smith-Rohrberg D, Bruce RD, Altice FL. Review of corrections-based therapy for opiate-depenndent patients: Implications for buprenorphine treatment among correctional populations. Journal of Drug Issues. 2004; 34(2):451–480.
18. Harrison, P.; Beck, A. U.S. Department of Justice. Prisoners in 2005. Washington, DC: Bureau of Justice Statistics; 2006.
19. Mumola, C. Justice UDo. Substance Abuse and Treatment, State and Federal Prisoners, 1997. 1999. p. 1-16.
20. National Center on Addiction and Substance Abuse (CASA). Addiction Treatment in Prison Will Reduce Crime, Save Billions of Tax Dollars, Says CASA Report. News Briefs. 1998 [Accessed March 28, 2005]. www.ndsn.org/jan98/prisons1.html
21. Testino G. Alcoholic diseases in hepato-gastroenterology: a point of view. Hepatogastroenterology. Mar-Apr; 2008 55(82–83):371–377. [PubMed: 18613369]
22. Volpicelli JR. Alcohol abuse and alcoholism: an overview. J Clin Psychiatry. 2001; 62( Suppl 20): 4–10. [PubMed: 11584874]
23. Caan, W. Drink, Drugs and Dependence: From Science to Clinical Practice. 1. Routledge; 2002.
24. Fazel S, Bains P, Doll H. Substance abuse and dependence in prisoners: a systematic review. Addiction. Feb; 2006 101(2):181–191. [PubMed: 16445547]
25. Shuper PA, Joharchi N, Irving H, Rehm J. Alcohol as a correlate of unprotected sexual behavior among people living with HIV/AIDS: review and meta-analysis. AIDS Behav. Dec; 2009 13(6): 1021–1036. [PubMed: 19618261]
26. Woolf SE, Maisto SA. Alcohol use and risk of HIV infection among men who have sex with men. AIDS Behav. Aug; 2009 13(4):757–782. [PubMed: 18236149]

27. Hendershot CS, Stoner SA, Pantalone DW, Simoni JM. Alcohol Use and Antiretroviral Adherence: Review and Meta-Analysis. J Acquir Immune Defic Syndr. Aug 7.2009
28. Zarkin GA, Bray JW, Babor TF, Higgins-Biddle JC. Alcohol drinking patterns and health care utilization in a managed care organization. Health Serv Res. Jun; 2004 39(3):553–570. [PubMed: 15149478]
29. Green JE, Saveanu RV, Bornstein RA. The effect of previous alcohol abuse on cognitive function in HIV infection. Am J Psychiatry. Feb; 2004 161(2):249–254. [PubMed: 14754773]
30. RachBeisel J, Scott J, Dixon L. Co-occurring severe mental illness and substance use disorders: a review of recent research. Psychiatr Serv. Nov; 1999 50(11):1427–1434. [PubMed: 10543851]
31. Smith-Rohrberg Maru D, Basu S, Altice FL. HIV Control Efforts should directly address incarceration. Lancet Infect Dis. 2007; 7(9):568–569. [PubMed: 17714668]
32. Linder JF, Enders SR, Craig E, Richardson J, Meyers FJ. Hospice care for the incarcerated in the United States: an introduction. Journal of palliative medicine. Aug; 2002 5(4):549–552. [PubMed: 12243679]
33. Murphy EL, Collier AC, Kalish LA, et al. Highly active antiretroviral therapy decreases mortality and morbidity in patients with advanced HIV disease. Ann Intern Med. Jul 3; 2001 135(1):17–26. [PubMed: 11434728]
34. Paterson DL, Swindells S, Mohr J, et al. Adherence to protease inhibitor therapy and outcomes in patients with HIV infection. Ann Intern Med. Jul 4; 2000 133(1):21–30. [PubMed: 10877736]
35. Springer SA, Friedland GH, Doros G, Pesanti E, Altice FL. Antiretroviral treatment regimen outcomes among HIV-infected prisoners. HIV Clin Trials. 2007; 8(4):205–212. [PubMed: 17720660]
36. Baillargeon J, Borucki MJ, Zepeda S, Jenson HB, Leach CT. Antiretroviral prescribing patterns in the Texas prison system. Clin Infect Dis. Dec; 2000 31(6):1476–1481. [PubMed: 11096015]
37. Stephenson BL, Wohl DA, McKaig R, et al. Sexual behaviours of HIV-seropositive men and women following release from prison. International journal of STD & AIDS. Feb; 2006 17(2): 103–108. [PubMed: 16464271]
38. Estebanez P, Zunzunegui MV, Aguilar MD, Russell N, Cifuentes I, Hankins C. The role of prisons in the HIV epidemic among female injecting drug users. AIDS Care. Feb; 2002 14(1):95–104. [PubMed: 11798408]
39. Tyndall MW, Patrick D, Spittal P, Li K, O'Shaughnessy MV, Schechter MT. Risky sexual behaviours among injection drugs users with high HIV prevalence: implications for STD control. Sex Transm Infect. 2002; 78( Suppl 1):i170–175. [PubMed: 12083439]
40. Margolis AD, MacGowan RJ, Grinstead O, Sosman J, Kashif I, Flanigan TP. Unprotected sex with multiple partners: implications for HIV prevention among young men with a history of incarceration. Sex Transm Dis. 2006; 33(3):175–180. [PubMed: 16505732]
41. Safren SA, Wingood G, Altice FL. Strategies for primary HIV prevention that target behavioral change. Clin Infect Dis. Dec 15; 2007 45( Suppl 4):S300–307. [PubMed: 18190303]
42. Beck, A.; Karberg, J.; Harrison, P. US Department of Justice. Prison and Jail Inmates at Midyear 2001. Bureau of Justice Statistics Bulletin; 2002.
43. Weaver MR, Conover CJ, Proescholdbell RJ, Arno PS, Ang A, Ettner SL. Utilization of mental health and substance abuse care for people living with HIV/AIDS, chronic mental illness, and substance abuse disorders. J Acquir Immune Defic Syndr. Apr 1; 2008 47(4):449–458. [PubMed: 18197121]
44. Cunningham CO, Sohler NL, Wong MD, et al. Utilization of health care services in hard-to-reach marginalized HIV-infected individuals. AIDS Patient Care STDS. Mar; 2007 21(3):177–186. [PubMed: 17428185]
45. Malow RM, Baker SM, Klimas N, et al. Adherence to complex combination antiretroviral therapies by HIV-positive drug abusers. Psychiatr Serv. Aug; 1998 49(8):1021–1022. 1024. [PubMed: 9712205]
46. Mellins CA, Havens JF, McDonnell C, et al. Adherence to antiretroviral medications and medical care in HIV-infected adults diagnosed with mental and substance abuse disorders. AIDS Care. Feb; 2009 21(2):168–177. [PubMed: 19229685]

47. Lucas GM, Gebo KA, Chaisson RE, Moore RD. Longitudinal assessment of the effects of drug and alcohol abuse on HIV-1 treatment outcomes in an urban clinic. AIDS. 2002; 16(5):767–774. [PubMed: 11964533]
48. Theall K, Clark R, Powell A, Smith H, Kissinger P. Alcohol Consumption, Art Usage and High-risk sex Among Women Infected with HIV. AIDS And Behavior. 2006 (epub August 8, 2006).
49. Palepu A, Tyndall MW, Li K, et al. Alcohol use and incarceration adversely affect HIV-1 RNA suppression among injection drug users starting antiretroviral therapy. J Urban Health. Dec; 2003 80(4):667–675. [PubMed: 14709714]
50. Soriano V, Puoti M, Sulkowski M, et al. Care of patients coinfected with HIV and hepatitis C virus: 2007 updated recommendations from the HCV-HIV International Panel. AIDS. 2007; 21(9): 1073–1089. [PubMed: 17502718]
51. Serfaty L, Poujol-Robert A, Carbonell N, Chazouilleres O, Poupon RE, Poupon R. Effect of the interaction between steatosis and alcohol intake on liver fibrosis progression in chronic hepatitis C. Am J Gastroenterol. Jul; 2002 97(7):1807–1812. [PubMed: 12135040]
52. Czaja AJ, Carpenter HA, Santrach PJ, Moore SB. Host- and disease-specific factors affecting steatosis in chronic hepatitis C. J Hepatol. 1998; 29(2):198–206. [PubMed: 9722200]
53. Salmon-Ceron D, Lewden C, Morlat P, et al. Liver disease as a major cause of death among HIV infected patients: role of hepatitis C and B viruses and alcohol. J Hepatol. Jun; 2005 42(6):799–805. [PubMed: 15973779]
54. Weber R, Sabin CA, Friis-Moller N, et al. Liver-related deaths in persons infected with the human immunodeficiency virus: the D:A:D study. Arch Intern Med. 2006; 166(15):1632–1641. [PubMed: 16908797]
55. Peters, R.; Wexler, H., et al. Tip 44: Substance abuse treatment for adults in the criminal justice system. Rockville, MD: United States Department of Health and Human Services (DHHS); 2008.
56. Volpicelli, J.; Pettinati, H.; McLellan, A.; O'Brien, C. Combining Medication and Psychosocial Treaments for Addictions: The BRENDA Approach. New York: Guilford Press; 2001.
57. Pettinati, H.; Weiss, R.; Miller, WR.; Donovan, D.; Ernst, D.; BJ, R. NIAAA. Bethesda, MD: DHHS; 2004. Medical Management Treatment Providing Pharmacotherapy as Part of the Treatment for Alcohol Dependence.
58. Monterosso JR, Flannery BA, Pettinati HM, et al. Predicting treatment response to naltrexone: the influence of craving and family history. Am J Addict. Summer;2001 10(3):258–268. [PubMed: 11579624]
59. Oslin DW, Lynch KG, Pettinati HM, et al. A placebo-controlled randomized clinical trial of naltrexone in the context of different levels of psychosocial intervention. Alcohol Clin Exp Res. 2008; 32(7):1299–1308. [PubMed: 18540910]
60. Kadden, R.; Carrol, K.; Donovan, D., et al. Health NIo. Cognitive Behavioral Coping Skills Therapy Manual: A Clinical Research Guide for Therapists Treating Individuals with Alcohol Abuse and Dependence. Rockville, MD: 1995.
61. Anton RF, Moak DH, Waid LR, Latham PK, Malcolm RJ, Dias JK. Naltrexone and cognitive behavioral therapy for the treatment of outpatient alcoholics: results of a placebo-controlled trial. Am J Psychiatry. 1999; 156(11):1758–1764. [PubMed: 10553740]
62. Anton RF. New methodologies for pharmacological treatment trials for alcohol dependence. Alcohol Clin Exp Res. 1996; 20(7 Suppl):3A–9A. [PubMed: 8651457]
63. Cullen, F.; Gendreau, P. The effectiveness of correctional rehabilitation: Reconsidering the "nothing works" debate. In: Goodstein, L.; MacKenzie, D., editors. The American Prison: Issues in Research and Policy. New York: Plenum Press; 1989. p. 23-44.
64. Whitlock EP, Polen MR, Green CA, Orleans T, Klein J. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. Apr 6; 2004 140(7):557–568. [PubMed: 15068985]
65. Palepu A, Horton NJ, Tibbetts N, Meli S, Samet JH. Uptake and adherence to highly active antiretroviral therapy among HIV-infected people with alcohol and other substance use problems: the impact of substance abuse treatment. Addiction. Mar; 2004 99(3):361–368. [PubMed: 14982549]

66. Suh JJ, Pettinati HM, Kampman KM, O'Brien CP. The status of disulfiram: a half of a century later. Journal of Clinical Psychopharmacology. Jun; 2006 26(3):290–302. [PubMed: 16702894]

67. DIsulfiram. Thomson MICROMEDEX. 2006 [Accessed November 29, 2006]. http://mdx.med.yale.edu:81/hcs/librarian/ND_PR/Main/SBK/1/PFPUI/vC3skXa1ChuIHW/ND_PG/PRIH/CS/3FC297/ND_T/HCS/ND_P/Main/DUPLICATIONSHIELDSYNC/588F76/ND_B/HCS/PFActionId/hcs.common.RetrieveDocumentCommon/DocId/184770/ContentSetId/42/SearchTerm/disulfiram/SearchOption/BeginWith

68. Kranzler, HR.; Rounsaville, BJ. Dual Diagnosis and Treatment: Substance Abuse and Comorbid Medical and Psychiatric Disorders. New York: Marcel Dekker; 1998.

69. Rush BR, Malla A. A comparison of disulfiram acceptors and refusers on selected demographic and clinical characteristics. Drug Alcohol Depend. Sep; 1984 14(1):75–85. [PubMed: 6489155]

70. Bourne PG, Alford JA, Bowcock JZ. Treatment of skid-row alcoholics with disulfiram. Quarterly Journal of Studies on Alcohol. Mar; 1966 27(1):42–48. [PubMed: 5907524]

71. Haynes SN. Contingency management in a municipally-administered antabuse program for alcoholics. Journal of Behavior Therapy and Experimental Psychiatry. 1973; 4(1):31.

72. Sereny G, Sharma V, Holt J, Gordis E. Mandatory supervised antabuse therapy in an outpatient alcoholism program: a pilot study. Alcoholism: Clinical & Experimental Research. Jun; 1986 10(3):290–292.

73. Gallant DM, Bishop MP, Faulkner MA, et al. A comparative evaluation of compulsory (group therapy and-or antabuse) and voluntary treatment of the chronic alcoholic munciple court offender. Psychosomatics. Nov–Dec; 1968 9(6):306–310. [PubMed: 5725612]

74. Acamprosate. Thomson MICROMEDEX. 2006 [Accessed November 29, 2006]. http://mdx.med.yale.edu:81/hcs/librarian/ND_PR/Main/PFPUI/vC3skXa1ChBW79/ND_PG/PRIH/CS/88A250/ND_T/HCS/ND_P/Main/DUPLICATIONSHIELDSYNC/ACFCFB/ND_B/HCS/PFDefaultActionId/hcs.main.KeywordSearch.Search

75. Littleton J. Acamprosate in alcohol dependence: how does it work? Addiction. Sep; 1995 90(9): 1179–1188. [PubMed: 7580816]

76. Mason BJ, Goodman AM, Dixon RM, et al. A pharmacokinetic and pharmacodynamic drug interaction study of acamprosate and naltrexone. Neuropsychopharmacology. Oct; 2002 27(4): 596–606. [PubMed: 12377396]

77. Mason BJ. Treatment of alcohol-dependent outpatients with acamprosate: a clinical review. Journal of Clinical Psychiatry. 2001; 62( Suppl 20):42–48. [PubMed: 11584875]

78. Krupitsky EM, Zvartau EE, Lioznov DA, et al. Co-morbidity of infectious and addictive diseases in St. Petersburg and the Leningrad Region, Russia. Eur Addict Res. 2006; 12(1):12–19. [PubMed: 16352898]

79. Project MATCH Research Group. Matching Alcoholism Treatments to Client Heterogeneity: Project MATCH posttreatment drinking outcomes. J Stud Alcohol. Jan; 1997 58(1):7–29. [PubMed: 8979210]

80. O'Malley SS. Opioid antagonists in the treatment of alcohol dependence: clinical efficacy and prevention of relapse. Alcohol & Alcoholism. 1996; 31( Suppl 1):77–81. [PubMed: 8737005]

81. O'Malley SS, Froehlich JC. Advances in the use of naltrexone: an integration of preclinical and clinical findings. Recent Developments in Alcoholism. 2003; 16:217–245. [PubMed: 12638640]

82. O'Brien CP. Anticraving medications for relapse prevention: a possible new class of psychoactive medications. American Journal of Psychiatry. Aug; 2005 162(8):1423–1431. [PubMed: 16055763]

83. Gianoulakis C, Krishnan B, Thavundayil J. Enhanced sensitivity of pituitary beta-endorphin to ethanol in subjects at high risk of alcoholism.[erratum appears in Arch Gen Psychiatry 1996 Jun; 53(6):555]. Archives of General Psychiatry. Mar; 1996 53(3):250–257. [PubMed: 8611062]

84. Balldin J, Berglund M, Borg S, et al. A 6-month controlled naltrexone study: combined effect with cognitive behavioral therapy in outpatient treatment of alcohol dependence. Alcoholism: Clinical & Experimental Research. Jul; 2003 27(7):1142–1149.

85. Monterosso JR, Flannery BA, Pettinati HM, et al. Predicting treatment response to naltrexone: the influence of craving and family history. American Journal on Addictions. 2001; 10(3):258–268. [PubMed: 11579624]

86. Petrakis IL, Poling J, Levinson C, et al. Naltrexone and disulfiram in patients with alcohol dependence and comorbid psychiatric disorders. Biological Psychiatry. May 15; 2005 57(10): 1128–1137. [PubMed: 15866552]
87. Garbutt JC, Kranzler HR, O'Malley SS, et al. Efficacy and tolerability of long-acting injectable naltrexone for alcohol dependence: a randomized controlled trial. JAMA. Apr 6; 2005 293(13): 1617–1625. [PubMed: 15811981]
88. Bruce RD, Altice FL, Gourevitch MN, Friedland GH. Pharmacokinetic drug interactions between opioid agonist therapy and antiretroviral medications: implications and management for clinical practice. J Acquir Immune Defic Syndr. Apr 15; 2006 41(5):563–572. [PubMed: 16652030]
89. Alkermes Pharmaceuticals. VIVITROL Package Insert. 2006 [Accessed January 4, 2010]. http://129.128.185.122/drugbank2/drugs/DB00704/fda_labels/153
90. Jeffrey GP, MacQuillan G, Chua F, et al. Hepatitis C virus eradication in intravenous drug users maintained with subcutaneous naltrexone implants. Hepatology. Jan; 2007 45(1):111–117. [PubMed: 17187435]
91. Weinrieb RM, O'Brien CP. A case report of naltrexone for alcoholism in a liver transplant recipient: side effects and safety. Am J Addict. Oct-Dec; 2004 13(5):495–497. [PubMed: 15764427]
92. Weinrieb RM, Van Horn DH, McLellan AT, et al. Alcoholism treatment after liver transplantation: lessons learned from a clinical trial that failed. Psychosomatics. Mar-Apr; 2001 42(2):110–116. [PubMed: 11239123]
93. Wolfhagen FH, Sternieri E, Hop WC, Vitale G, Bertolotti M, Van Buuren HR. Oral naltrexone treatment for cholestatic pruritus: a double-blind, placebo-controlled study. Gastroenterology. Oct; 1997 113(4):1264–1269. [PubMed: 9322521]
94. Nunn A, Zaller N, Dickman S, Trimbur C, Nijhawan A, Rich JD. Methadone and buprenorphine prescribing and referral practices in US prison systems: results from a nationwide survey. Drug Alcohol Depend. 2009; 105(1–2):83–88. [PubMed: 19625142]
95. Perez LM, Ro MJ, Treadwell HM. Vulnerable populations, prison, and federal and state Medicaid policies: avoiding the loss of a right to care. J Correct Health Care. Apr; 2009 15(2):142–149. [PubMed: 19477818]
96. National Center on Addiction and Substance Abuse (CASA). Behind Bars: Substance Abuse and America's Prison Population. New York, NY: Columbia University; 1998.
97. American Correctional Association. Standards for Adult Correctional Institutions. 3. American Correctional Association; 1990.
98. Center for Substance Abuse Treatment. Substance Abuse and Mental Health Services Administration. Treatment Improvement Protocol (TIP) Series 44. Rockville, MD: DHHS Publication No. (SMA) 05–4056; 2005. Substance Abuse Treatment for Adults in the Criminal Justice System.
99. Peters, R.; Steinberg, M. Substance abuse treatment services in U.S. prisons. In: Shewan, D.; Davies, J., editors. Drug Use and Prisons. Singapore: Harwood Academic Publishers; 2000. p. 89-116.
100. Copenhaver M, Chowdhury S, Altice FL. Adaptation of an Evidence-Based Intervention Targeting HIV-Infected Prisoners Transitioning to the Community: The Process and Outcome of Formative Research for the Positive Living Using Safety (PLUS) Intervention. AIDS Patient Care STDS. Apr; 2009 23(4):277–287. [PubMed: 19260773]
101. Grinstead O, Zack B, Faigeles B. Reducing postrelease risk behavior among HIV seropositive prison inmates: the health promotion program. AIDS Educ Prev. Apr; 2001 13(2):109–119. [PubMed: 11398956]
102. Springer S, Chen S, Altice FL. Improved HIV and Substance Abuse Treatment Outcomes For Released HIV-Infected Prisoners: The Impact of Buprenorphine Treatment. Journal of Urban Health. 2010
103. Krupitzky, E.; Illeperuma, A.; Gastfriend, DR.; Silverman, BL. Efficacy and Safety of Extended-Release Injectable Naltrexone (XR-NTX) for the Treatment of Opioid Dependence. American Psychiatric Association; New Orleans, LA: 2010.