Published in final edited form as:

J Addict Med. 2017 ; 11(5): 350–356. doi:10.1097/ADM.0000000000000327.

Pilot Studies examining feasibility of Substance Use Disorder (SUD) Screening and Treatment Linkage at Urban Sexually Transmitted Disease (STD) Clinics

J. Gryczynski^{1,*}, C. D. Nordeck¹, S. G. Mitchell¹, K.R. Page², L. Johnsen³, K. E. O'Grady⁴, and R. P. Schwartz¹

¹Friends Research Institute, Baltimore MD

²Johns Hopkins University, Baltimore MD

³Baltimore City Health Department, Baltimore MD

⁴University of Maryland, College Park

Abstract

Background—Sexually transmitted disease (STD) clinics provide critical public health services for screening and treatment of sexually transmitted infections throughout the US. These settings serve high-risk populations, often on a walk-in basis, and may be promising venues for integrating substance use disorder (SUD) services.

Methods—We report findings from two pilot studies conducted at Baltimore City Health Department's (BCHD) STD clinics. The Screening study characterized rates of SUDs among STD clinic patients. Patients waiting for services completed a diagnostic interview mapping to DSM-5 SUD criteria ($N=100$). The Treatment Linkage Feasibility study examined the feasibility of linking STD clinic patients with opioid and/or cocaine use disorders to SUD treatment in the community ($N=21$), using SUD-focused Patient Navigation services for one month after the STD clinic visit. Assessments were conducted at baseline and 1-month follow-up.

Results—In the Screening study, the majority of STD clinic patients met diagnostic criteria for alcohol and/or drug SUD (57%). Substance-specific SUD rates among patients were 35% for alcohol, 31% for cannabis, 11% for opioids, and 8% for stimulants (cocaine/amphetamines). In the Treatment Linkage Feasibility study, 57% (12/21) of participants attended at least one SUD service, and 38% (8/21) were actively enrolled in SUD treatment by 1-month follow-up. The sample reported significant reductions in past 30-day cocaine use from baseline to follow-up ($p=.01$).

Conclusions—SUD rates are high among STD clinic patients. STD clinics are viable settings for initiating SUD treatment linkage services. Larger-scale research on integrating SUD services in these settings is needed.

*corresponding author: Friends Research Institute, 1040 Park Avenue, Suite 103, Baltimore MD 21201. jgryczynski@friendsresearch.org.

Disclosures: The authors report no conflicts of interest.

Keywords

screening; treatment linkage; STD clinic; patient navigation; opioids; cocaine

---

Introduction

Most people who could benefit from substance use disorder (SUD) treatment do not actively seek it (SAMHSA, 2014). Left untreated, SUDs contribute significantly to mortality (Degenhardt et al., 2011a; 2011b; Degenhardt et al., 2014; Scott et al., 2011), public health burdens (Degenhardt & Hall, 2012; Degenhardt et al., 2013), and various economic and societal costs (Mark et al. 2001; Birnbaum et al., 2011; Rehm et al., 2009). SUDs have a high rate of comorbidity with sexually transmitted diseases (STD), including HIV/AIDS, syphilis, and chlamydia (Tetrault et al., 2010; Booth et al., 1993; CDC, 2013; Calsyn et al., 2010; Cook & Clark, 2005; Zenilman et al., 1994). Injection drug use continues to be a risk factor for HIV transmission, and drug use can impair judgment, including increased risk of unsafe sex practices (Burnette et al., 2008; CDC, 2013; Cook & Clark, 2005; Ostrow et al., 2009; Reback et al., 2008; Ross et al., 2003). Whether by predisposition to risky behaviors, impaired decision-making, disorganization, or direct health effects, substance use can potentially impact the acquisition and clinical prognosis of STDs. Linking individuals with SUDs to treatment can effectively reduce drug use and its attendant problems (Farrell et al., 2005; Sorensen & Copeland, 2000; Volkow et al., 2011; Wood et al., 2004).

Research shows high rates of SUDs among STD clinic patients. One study with young people ages 15–24 attending an urban STD clinic found that prevalence of SUDs was higher than that of confirmed STDs (Cook et al., 2006). In the general population, STDs have been found to be associated with alcohol use disorders and marijuana use (Tetrault et al., 2010). Prior research suggests that screening can effectively identify STD clinic patients with substance use problems, and supports the feasibility of providing interventions for substance use in the STD clinic setting (Appel et al., 2006; 2015; Lane et al., 2008; Yu et al., 2008). Moreover, there is emerging evidence that providing substance use interventions in STD clinic settings is associated with improved outcomes, including reduced incidence of STD infection detected at subsequent clinic visits (Rogers et al., 2015; Yu et al., 2016).

The current manuscript reports findings from two pilot studies conducted at the two Baltimore City Health Department (BCHD) STD clinics. The Screening study characterized rates of substance use and SUDs among STD clinic patients. Prior studies have examined substance use and/or its correlates among STD clinic patients using frequency/quantity measures or screening tools (e.g., Hutton et al., 2008; Senn et al., 2015; Scott-Sheldon et al., 2009; Zenilman et al., 1994), but few have specifically assessed SUD criteria among STD clinic patients (e.g., Cook et al., 2006 did, for alcohol and marijuana). To our knowledge, this is the first study to characterize SUDs in this population using Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) criteria. The Treatment Linkage Feasibility study examined the feasibility of linking STD clinic patients with opioid and/or cocaine use disorders to SUD treatment in the community using a patient navigation service,

for which feasibility and efficacy are unknown in this clinical population. Both of these studies were conducted to inform future research and clinical services in STD clinics.

Methods

Below we describe the methodology for two pilot studies conducted at the two public STD clinics in Baltimore, MD. These studies focused on characterizing rates of SUDs among clinic patients (Study 1; Screening), and linking patients to SUD treatment (Study 2; Treatment Linkage Feasibility); See Table 1.

The two clinics provide walk-in STD testing and treatment (including HIV primary care and pre-exposure prophylaxis [PrEP]) for city residents. Located in East and West Baltimore, the clinics are open on alternating days, and serve urban, primarily minority populations. Study 1 was conducted at the East Baltimore clinic, while Study 2 was conducted at both clinic locations. Both studies were approved by the Friends Research Institute's Institutional Review Board and underwent BCHD internal review.

Study 1 – Screening

Recruitment—Research staff approached patients in the clinic waiting area and invited them to participate in a health study. Patients who expressed interest were accompanied to a private office in the clinic, where research staff described the study in detail. Because no names or other identifying information were collected as part of this study, written informed consent was not required by the IRB. Researchers obtained verbal consent and provided participants an information sheet. With the goal of recruiting 100 participants, research staff approached 135 patients; 35 declined and the remaining 100 completed a private face-to-face interview. Because patients were approached directly in the waiting area, the 100 participants should be representative of the population of clinic patients who would agree to be interviewed.

Assessment—The interview consisted of selected items from the modified World Mental Health Composite International Diagnostic Interview (WMH CIDI; World Health Organization, 2015), which map to DSM-5 SUD criteria. An earlier version of the CIDI was widely used to determine SUDs in epidemiological and clinical trials research (Forman et al., 2004). Consistent with revised criteria from DSM-IV to DSM-5 (Hasin et al., 2013), a scoring modification involved dropping the legal problems item and adding an item on craving. Our team has used this approach to assess DSM-5 SUDs in various clinical populations (Gryczynski et al., 2015; Kelly et al., 2014; McNeely et al., 2016). The modified WMH CIDI items query clinically significant problems in the past 12 months based on DSM-5 criteria separately for different substance classes, including alcohol, cannabis, heroin, prescription opioids, cocaine, amphetamines, and sedatives. For prescription medications, participants were explicitly asked to only report non-medical use, that is, use of medications *“that were not prescribed to you by a doctor, or that you used more than prescribed or for longer than prescribed”*. Participants received a \$5 gift card to a local sandwich shop for completing the interview.

Study 2 – Treatment Linkage Feasibility

Recruitment—STD clinical staff informed patients about a potential health study opportunity, and referred interested patients for screening by research staff, who privately assessed patients for eligibility after their medical visit. Patients were eligible if they were STD clinic patients, age 18 or older, and met diagnostic criteria for DSM-5 opioid and/or cocaine use disorder (assessed as in Study 1). Patients were excluded if they could not understand English, reported no use of opioids or cocaine in the past month, or were unwilling or unable to provide informed consent.

Intervention—Due to resource constraints, we used an abbreviated 1-month form of an intervention model that coupled motivational interviewing techniques (Miller & Rollnick, 2012) to address internal barriers (e.g., ambivalence about treatment, low motivation, etc.), with Patient Navigation services to address external barriers (e.g., disorganization, lack of transportation or insurance, etc.). Patient Navigation is a promising strategy utilized to link patients to appropriate outpatient services in the community (Bradford et al., 2007; Freeman et al., 1995; Freeman & Rodriguez, 2011; Gardner et al., 2005; Percac-Lima et al., 2009). Navigators work with patients to overcome various barriers to care and facilitate access to appropriate services. Table 2 describes the types of barriers that might be encountered and how the Navigator would respond. This patient-centered strategy is fitting to guide low-resource and/or vulnerable populations through the intricacies of the modern healthcare system, and may be particularly well-suited for bridging the gap across the distinct public health sectors of STD clinics and SUD treatment.

The intervention was delivered by a non-clinician but experienced Patient Navigator, who had worked on large clinical trials of Patient Navigation, including a clinical trial with hospitalized HIV patients and an ongoing trial of patient navigation for newly-released jail inmates. The Navigator's role on those studies included specialized training and supervision in case management and motivational interviewing.

In the initial session, the Navigator gauged participants' readiness for SUD treatment and explored each participants' specific combination of strengths (e.g., family support), barriers (e.g., lack of insurance), and preferences (e.g., preference for a certain modality or program) that might have a bearing on their treatment entry. The Navigator used motivational interviewing techniques to attempt to resolve any ambivalence about treatment and made an individualized plan regarding SUD treatment entry. If participants were willing, the Navigator would attempt to catalyze the treatment-seeking process that same day, either by calling the city's treatment referral hotline with the participant, calling a specific program (if the participant was interested in a specific modality or facility), or accompanying the participant to a nearby outpatient SUD treatment program to begin the process of enrollment.

The Patient Navigator worked with participants over the next month, delivering motivational intervention coupled with proactive barrier resolution services (see Table 2) through multiple in-person visits, phone, and text contacts. Although the frequency and duration of contacts varied based on patients' needs and willingness for treatment, as a general framework the Navigator sought to have an in-person meeting with participants weekly (in addition to

phone and text contacts, and communications with community providers on the participant's behalf). In-person meetings took place where convenient for participants (typically at the Navigator's office, participants' homes, public areas, or at other service providers).

Assessment—Research assessments consisted of a brief structured face-to-face interview querying substance use and related problems, medical history, and health service utilization. The interview form was specially developed for this study to rapidly assess key background and behavioral characteristics, and drew items from established instruments such as the Addiction Severity Index, 5th Edition (McLellan et al., 1992). For medical history, items queried overnight hospitalizations and emergency department visits (lifetime, past year, and past 30 day), whether the participant currently had a primary care doctor, prior lifetime SUD treatment history, and lifetime diagnoses for HIV, hepatitis C, and sexually transmitted infections. The assessment also queried past 30-day frequency of heroin use, non-medical use of prescription opioids, cocaine, any injection drug use, heavy alcohol use (defined as 5 or more drinks of alcohol on an occasion), unprotected sex, sex while under the influence of drugs or alcohol, and number of sex partners. A follow-up face-to-face interview was conducted at 1-month post-enrollment, and focused on the same behaviors in the past 30 days, as well as a series of yes/no questions about attempts to stop or cut down on drug use, and efforts for SUD treatment-seeking. Participants who did not enter SUD treatment by the follow-up point were asked how likely they were to enter treatment within the next 3 months (very unlikely, somewhat unlikely, somewhat likely, very likely). Finally, participants were asked to rate their satisfaction with Patient Navigation services (very dissatisfied, somewhat dissatisfied, somewhat satisfied, very satisfied). Participants were paid \$25 for completing each assessment (regardless of whether they sought or entered treatment). No payment was provided for Patient Navigation visits. Nineteen participants completed the 1-month research follow-up (90% follow-up rate), with 2 participants unable to be located (both of these participants also could not be located for face-to-face Patient Navigation visits, although both had intermittent phone contact with the Navigator).

Analysis—Given the preliminary nature of the study and the small sample, participant characteristics and outcomes were primarily summarized using descriptive statistics (e.g., means, proportions). We examined change in self-reported frequency of substance use via paired t-tests. For analysis purposes, we conservatively assumed that the two participants lost to follow-up had unchanged substance use from baseline (i.e., last observation carried forward), and had not sought or entered SUD treatment.

Results

Study 1 – Screening (N=100)

Participants were 39% female, 86% African American, 10% White, and 4% Hispanic ethnicity. The age distribution was: 29% 18–25 years, 39% 26–35 years, 14% 36–45 years, 14% 46–55 years, and 4% 56 years or older. Rates of past year substance use and DSM-5 SUDs are shown in Table 3. A majority of participants (57%) met diagnostic criteria for an alcohol and/or drug SUD, with 41% meeting SUD criteria for illicit or prescription drugs. The most common illicit drug use disorder was for cannabis, with 31% meeting criteria for

cannabis use disorder. Rates of opioid and stimulant use disorders were 11% and 8%, respectively (4% met criteria for both).

Study 2 – Treatment Linkage Feasibility (N=21)

We screened 114 STD clinic patients for eligibility, of whom 25 were eligible, and 21 provided informed consent and were enrolled (13 and 8 at the West and East Baltimore sites, respectively). Only four eligible participants declined to participate (due to either lack of time or interest in SUD treatment). Although we did not track the number of patients who were informed about the study opportunity by clinic staff, 22% of those screened by research staff were eligible, and 84% of those who were eligible agreed to participate.

Participants were 38% female, 90% African American, and had a mean age of 42 ($SD=12$; ages 19–59). The majority reported no current employment (86%). With respect to DSM-5 opioid and cocaine use disorders, 76% met diagnostic criteria for opioids, while 40% met criteria for cocaine. Importantly, 61% met criteria for a *severe* use disorder (defined as 6 or more DSM-5 criteria). Moreover, 48% had no prior SUD treatment experience. Baseline characteristics of the sample are shown in Table 4.

Table 5 summarizes contacts with the Patient Navigator over the 1-month study period. Most participants successfully engaged with the Navigator through face-to-face visits, phone conversations, and texts. By 1-month follow-up, 57% (12/21) of the sample reported attending and receiving SUD services (note: includes one participant who enrolled in SUD treatment within one week of follow-up), while 38% (8/21) were enrolled in SUD treatment (confirmed by program records with participants' permission). The four participants who received services but were not actively enrolled in SUD treatment had not yet completed admission requirements, or discontinued treatment prior to assessment. There were a total of 11 participants who did not enter SUD treatment and completed the follow-up assessment. When asked how likely they were to get SUD treatment in the next 3 months, one participant reported "somewhat unlikely", while 10 reported "very likely". Of the 19 participants who completed follow-up, 1 participant reported being "somewhat satisfied" with Patient Navigation services, while 18 reported being "very satisfied".

Figure 1 compares past 30-day frequency of substance use at baseline vs. 1-month follow-up. Although underpowered, there was a nominal reduction in self-reported frequency of substance use in the past 30 days (reduction of 32% for heroin, 26% for non-medical prescription opioids, 83% for cocaine, and 47% for heavy alcohol use), with the reduction in cocaine use reaching statistical significance ($p=.01$). All participants who completed follow-up reported attempting to stop or cut down their drug use, thinking about getting SUD treatment, and making an effort to seek SUD treatment.

Discussion

This preliminary research shows feasibility of screening STD clinic patients for substance use, documents high rates of SUDs in an urban public STD clinic setting, and supports the feasibility of linking STD clinic patients with opioid and/or cocaine use disorders to SUD

treatment in the community. Our findings suggest that STD clinics may tap into a substantial high-need population with SUDs, a considerable subset of which may be treatment-naïve.

Among STD clinic patients approached in the waiting room and asked to complete a private health interview, 74% agreed to participate. Rates of SUDs were high in this sample [Study 1], with 35% meeting diagnostic criteria for alcohol use disorder, and 41% meeting criteria for a drug use disorder. Overall, more than half of the sample met DSM-5 criteria for either alcohol or drug use disorder. These rates are considerably higher than typically found in primary care settings. For example, a study at an urban primary care clinic of a safety net hospital found that 12% of participants met alcohol use disorder criteria (Smith et al. 2009), while 13% met criteria for a drug use disorder (Smith et al., 2010). Another study conducted in primary care clinics in New York and Boston found SUD rates of 13% for alcohol and 16% for illicit drugs (McNeely et al., 2015). A trial of initiating buprenorphine in the emergency department found rates of opioid use <2%, with still fewer opioid-dependent (D'Onofrio et al., 2015). Hence, STD clinics are a medical setting with relatively high prevalence of SUDs.

Over one-in-ten STD clinic patients met diagnostic criteria for an opioid use disorder (either heroin or prescription opioids). Given the epidemic of opioid use disorders and overdose mortality in the US (Dart et al., 2015; Rudd et al., 2016), public STD clinics may be a promising medical setting in which to identify high-risk patients with opioid use disorders, link them to opioid pharmacotherapy, and provide overdose prevention education and naloxone. In recent years prevention of opioid overdose has become a priority initiative at BCHD. As part of these efforts, clinicians at the STD clinics now provide naloxone prescriptions to patients who report opioid misuse. The integration of additional SUD services could be a logical step for STD clinics as part of a comprehensive public health approach to SUDs and the opioid use disorder epidemic.

The Treatment Linkage Feasibility study showed that recruiting STD clinic patients into this type of study was feasible and acceptable. Despite not seeking SUD services, 84% of those eligible agreed to participate in a study with the explicit goal of helping them enter SUD treatment. We consider the rate of SUD treatment entry (57% having accessed some SUD services; 38% enrolled in treatment at 1-month follow-up) to be quite promising, particularly considering the time- and resource-limited version of the services in the pilot, and the inherent challenges of engaging non-treatment seeking populations. Although this pilot cannot speak to base rates of unassisted treatment entry in usual care, such rates are likely to be very low in a 1-month time span because STD clinic patients are not expressly seeking SUD treatment. A screening, brief intervention, and referral to treatment (SBIRT) program in New York City STD clinics found that 19% of patients referred to SUD treatment were eventually admitted to a treatment program, although only 7% did so within 30 days (Yu et al., 2016). Findings from the current pilot suggest that high rates of treatment entry can be achieved fairly quickly with SUD-focused patient navigation services. Importantly, our service model went beyond many typical referral practices or caseworker activities. Key elements included coupling motivational intervention and case management/barrier resolution, working very proactively with a small caseload towards the goal of SUD treatment entry, establishing relationships with local SUD providers, and engaging with

patients in the community for several weeks after their STD clinic visit. Additional research is needed to determine if such rates of treatment entry can be sustained with wider-scale implementation, under normal service delivery conditions.

In some ways the Patient Navigation intervention reflects a model of care coordination and continuity already widely employed for HIV care. Many STD clinics are familiar with this model. Extending elements of it to address SUDs may require some creative reorganization, but could hold public health benefits. Although they typically provide episodic care, STD clinics have clinical infrastructure that could be leveraged to support various SUD services, including screening, intervention and referral, and direct initiation of SUD treatment – as done successfully with buprenorphine initiation in the emergency department, another episodic care setting (D’Onofrio et al., 2015).

The two studies reported in this manuscript have several important limitations. Both were conceptualized as preliminary-stage studies, with the primary purpose of informing future work to integrate substance use services into the STD clinics. Sample sizes were small. The treatment linkage study was certainly underpowered and lacked a comparison group. It is not known what the natural change in substance use or SUD treatment entry would be in the absence of intervention. Due to resource constraints, the research activities (i.e., eligibility screening; assessment) and Patient Navigation services were conducted by the same staff member, which could potentially bias self-report; ideally research and service roles would be decoupled. The intervention was also time-limited, lasting only one month. A longer period with the Navigator may have yielded even better SUD treatment entry rates while supporting early retention and engagement (as well as re-engagement of patients who leave treatment prematurely). The treatment linkage study focused on patients with opioid and/or cocaine use disorders, and not the more common SUDs of alcohol and marijuana, which could be the subject of future investigation. The studies were conducted in a single city and may not generalize to all other public STD clinics. Patterns of substance use in such settings will vary based on those of the community at large, and the feasibility of SUD treatment linkage depends on local treatment system capacity.

The findings from the treatment linkage study were promising, but more research is needed to determine the feasibility and efficacy of providing such services in STD clinic settings at a larger scale and with longer follow-up. Additionally, future research should also consider service models with more complete integration of SUD services in STD clinic settings (e.g., initiating buprenorphine for opioid use disorder treatment on-site, with subsequent linkage to a physician or specialty program for continued maintenance treatment). These preliminary studies support STD clinics as viable and highly promising settings for providing SUD services.

Acknowledgments

Support: Research reported in this publication was supported by the National Institute on Drug Abuse R01DA020063 (PI Schwartz) and R01DA037942 (PI Gryczynski). The content is solely the responsibility of the authors and does not necessarily represent the official views of NIDA. NIDA had no role in the design and conduct of the study; data acquisition, management, analysis, and interpretation of the data; and preparation, review, or approval of the manuscript.

References

- Appel PW, Piculell R, Jansky HK, Griffy K. Assessing alcohol and other drug problems (AOD) among sexually transmitted disease (STD) clinic patients with a modified CAGE-A: implications for AOD intervention services and STD prevention. *Am J Drug Alcohol Abuse*. 2006; 32(2):225–236. [PubMed: 16595325]
- Appel PW, Warren BE, Yu J, et al. Implementing Substance Abuse Intervention Services in New York City Sexually Transmitted Disease Clinics: Factors Promoting Interagency Collaboration. *J Behav Health Serv Res*. 2015; 15:1–9.
- Birnbaum HG, White AG, Schiller M, Waldman T, Cleveland JM, Roland CL. Societal costs of prescription opioid abuse, dependence, and misuse in the United States. *Pain Med*. 2011; 12(4):657–667. [PubMed: 21392250]
- Booth RE, Watters JK, Chitwood DD. HIV risk-related sex behaviors among injection drug users, crack smokers, and injection drug users who smoke crack. *Am J Public Health*. 1993; 83(8):1144–1148. [PubMed: 8342724]
- Bradford JB, Coleman S, Cunningham W. HIV System Navigation: an emerging model to improve HIV care access. *AIDS Patient Care STDs*. 2007; 21(Suppl 1):S49–58. [PubMed: 17563290]
- Burnette ML, Lucas E, Ilgen M, Frayne SM, Mayo J, Weitlauf JC. Prevalence and health correlates of prostitution among patients entering treatment for substance use disorders. *Arch Gen Psych*. 2008; 65(3):337–344.
- Calsyn DA, Cousins SJ, Hatch-Maillette MA, et al. Sex under the influence of drugs or alcohol: common for men in substance abuse treatment and associated with high-risk sexual behavior. *Am J Addict*. 2010; 19(2):119–127. [PubMed: 20163383]
- Centers for Disease Control and Prevention. [Accessed July 21, 2016] HIV and substance use in the United States. 2013. Available at: http://www.cdc.gov/hiv/pdf/risk_hiv_substance.pdf
- Cook RL, Clark DB. Is there an association between alcohol consumption and sexually transmitted diseases? A systematic review. *J Sex Transm Dis*. 2005; 32(3):156–164.
- Cook RL, Comer DM, Wiesenfeld HC, et al. Alcohol and drug use and related disorders: An underrecognized health issue among adolescents and young adults attending sexually transmitted disease clinics. *J Sex Transm Dis*. 2006; 33(9):565–570.
- D'Onofrio G, O'Connor PG, Pantalon MV, Chawarski MC, Busch SH, Owens PH, ... Fiellin DA. Emergency department-initiated buprenorphine/naloxone treatment for opioid dependence: a randomized clinical trial. *J Am Med Assoc*. 2015; 313(16):1636–1644.
- Dart RC, Severtson SG, Bucher-Bartelson B. Trends in opioid analgesic abuse and mortality in the United States. *N Engl J Med*. 2015; 372:1573–1574.
- Degenhardt L, Bucello C, Mathers B, et al. Mortality among regular or dependent users of heroin and other opioids: a systematic review and meta-analysis of cohort studies. *Addiction*. 2011a; 106(1):32–51. [PubMed: 21054613]
- Degenhardt L, Hall W. Extent of illicit drug use and dependence, and their contribution to the global burden of disease. *Lancet*. 2012; 379(9810):55–70. [PubMed: 22225671]
- Degenhardt L, Larney S, Randall D, Burns L, Hall W. Causes of death in a cohort treated for opioid dependence between 1985 and 2005. *Addiction*. 2014; 109(1):90–99. [PubMed: 23961881]
- Degenhardt L, Singleton J, Calabria B, et al. Mortality among cocaine users: a systematic review of cohort studies. *Drug Alcohol Depend*. 2011b; 113(2–3):88–95. [PubMed: 20828942]
- Degenhardt L, Whiteford HA, Ferrari AJ, et al. Global burden of disease attributable to illicit drug use and dependence: findings from the Global Burden of Disease Study 2010. *Lancet*. 2013; 382:1564–74. [PubMed: 23993281]
- Farrell M, Gowing L, Marsden J, Ling W, Ali R. Effectiveness of drug dependence treatment in HIV prevention. *Int'l J Drug Policy*. 2005; 16(Suppl 1):67–75.
- Forman RF, Svikis D, Montoya ID, Blaine J. Selection of a substance use disorder diagnostic instrument by the National Drug Abuse Treatment Clinical Trials Network. *J Subst Abuse Treat*. 2004; 27(1):1–8. [PubMed: 15223087]
- Freeman HP, Muth BJ, Kerner JF. Expanding access to cancer screening and clinical follow-up among the medically underserved. *Cancer Practice*. 1995; 3(1):19–30. [PubMed: 7704057]

- Freeman HP, Rodriguez RL. History and principles of patient navigation. *Cancer*. 2011; 117(15 Suppl): 3539–3542. [PubMed: 21780088]
- Gardner LI, Metsch LR, Anderson-Mahoney P, et al. Efficacy of a brief case management intervention to link recently diagnosed HIV-infected persons to care. *AIDS*. 2005; 19(4):423–431. [PubMed: 15750396]
- Gryczynski J, Kelly SM, Mitchell SG, Kirk A, O'Grady KE, Schwartz RP. Validation and performance of the Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) among adolescent primary care patients. *Addiction*. 2015; 110(2):240–247. [PubMed: 25311148]
- Hasin DS, O'Brien CP, Auriacombe M, et al. DSM-5 Criteria for Substance Use Disorders: Recommendations and Rationale. *Am J Psychiatry*. 2013; 170(8):834–851. [PubMed: 23903334]
- Hutton HE, McCaul ME, Santora PB, Erbeling EJ. The relationship between recent alcohol use and sexual behaviors: gender differences among sexually transmitted disease clinic patients. *Alcoholism: Clin Exp Res*. 2008; 32(11):2008–2015.
- Kelly SM, Gryczynski J, Mitchell SG, Kirk A, O'Grady KE, Schwartz RP. Validity of brief screening instrument for adolescent tobacco, alcohol, and drug use. *Pediatrics*. 2014; 133(5):819–826. [PubMed: 24753528]
- Lane J, Proude EM, Conigrave KM, de Boer JP, Haber PS. Nurse-provided screening and brief intervention for risky alcohol consumption by sexual health clinic patients. *Sex Transm Infect*. 2008; 84(7):524–527. [PubMed: 18708482]
- Mark TL, Woody GE, Juday T, Kleber HD. The economic costs of heroin addiction in the United States. *Drug Alcohol Depend*. 2001; 61(2):195–206. [PubMed: 11137285]
- McLellan AT, Kushner H, Metzger D, et al. The fifth edition of the Addiction Severity Index. *J Subst Abuse Treat*. 1992; 9(3):199–213. [PubMed: 1334156]
- McNeely J, Cleland CM, Strauss SM, Palamar JJ, Rotrosen J, Saitz R. Validation of Self-Administered Single-Item Screening Questions (SISQs) for unhealthy alcohol and drug use in primary care patients. *J Gen Intern Med*. 2015; 30(12):1757–1764. [PubMed: 25986138]
- McNeely J, Wu LT, Subramaniam G, Sharma G, Cathers LA, Svikis D, et al. Performance of the tobacco, alcohol, prescription medication, and other substance use (TAPS) tool for substance use screening in primary care patients. *Annals Intern Med*. 2016; 165(10):690–699.
- Ostrow DG, Plankey MW, Cox C, et al. Specific sex drug combinations contribute to the majority of recent HIV seroconversions among MSM in the MACS. *J AIDS* (1999). 2009; 51(3):349–355.
- Percac-Lima S, Grant RW, Green AR, et al. A culturally tailored navigator program for colorectal cancer screening in a community health center: a randomized, controlled trial. *J Intern Med*. 2009; 24(2):211–217.
- Reback CJ, Shoptaw S, Grella CE. Methamphetamine use trends among street-recruited gay and bisexual males, from 1999 to 2007. *J Urban Health*. 2008; 85(6):874–879. [PubMed: 18843536]
- Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*. 2009; 373(9682):2223–2233.
- Rogers M, Johnson K, Yu J, Cuoco L, Blank S. Impact of a Brief Intervention for Substance Use on Acquisition of Sexually Transmitted Diseases Including HIV: Findings From an Urban Sexually Transmitted Disease Clinic Population. *J Sex Transm Dis*. 2015; 42(10):569–574.
- Ross L, Kohler CL, Grimley DM, Bellis J. Intention to use condoms among three low-income, urban African American subgroups: cocaine users, noncocaine drug users, and non-drug users. *J Urban Health*. 2003; 80(1):147–160. [PubMed: 12612104]
- Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in Drug and Opioid Overdose Deaths--United States, 2000–2014. *MMWR Morb Mortal Wkly Rep*. 2016; 64:1378–1382. [PubMed: 26720857]
- Senn TE, Carey MP, Venable PA. The intersection of violence, substance use, depression, and STDs: testing of a syndemic pattern among patients attending an urban STD clinic. *J Nat Med Assoc*. 2010; 102(7):614–620.
- Scott CK, Dennis ML, Laudet A, Funk RR, Simeone RS. Surviving drug addiction: the effect of treatment and abstinence on mortality. *Am J Public Health*. 2011; 101(4):737–744. [PubMed: 21330586]

- Scott-Sheldon LA, Carey MP, Venable PA, Senn TE, Coury-Doniger P, Urban MA. Alcohol consumption, drug use, and condom use among STD clinic patients. *J Studies Alc Drugs*. 2009; 70(5):762–770.
- Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. Primary care validation of a single-question alcohol screening test. *J Gen Intern Med*. 2009; 24:783–788. [PubMed: 19247718]
- Smith PC, Schmidt SM, Allensworth-Davies D, Saitz R. A single-question screening test for drug use in primary care. *Arch Intern Med*. 2010; 170:1155–1160. [PubMed: 20625025]
- Sorensen JL, Copeland AL. Drug abuse treatment as an HIV prevention strategy: a review. *Drug Alcohol Depend*. 2000; 59(1):17–31. [PubMed: 10706972]
- Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Rockville, MD: SAMHSA; 2014. NSDUH Series H-48, HHS Publication No. (SMA) 14–4863
- Tetrault JM, Fiellin DA, Niccolai LM, Sullivan LE. Substance use in patients with sexually transmitted infections: results from a national U.S. survey. *Am J Addict*. 2010; 19(6):504–509. [PubMed: 20958845]
- Volkow ND, Baler RD, Normand JL. The unrealized potential of addiction science in curbing the HIV epidemic. *Curr HIV Res*. 2011; 9(6):393–395. [PubMed: 21999774]
- World Health Organization. [Accessed September 14, 2016] The World Mental Health Composite International Diagnostic Interview. 2015. Available at: <http://www.hcp.med.harvard.edu/wmhcid/index.php>
- Wood E, Spittal P, Li K, et al. Inability to access addiction treatment and risk of HIV infection among injection drug users. *J AIDS*. 2004; 36(2):750–754.
- Yu J, Appel PW, Warren BE, et al. Substance abuse intervention services in public STD clinics: a pilot experience. *J Subst Abuse Treat*. 2008; 34(3):356–362. [PubMed: 17614241]
- Yu J, Appel P, Rogers M, et al. Integrating intervention for substance use disorder in a healthcare setting: practice and outcomes in New York City STD clinics. *Am J Drug Alcohol Abuse*. 2016; 42(1):32–38. [PubMed: 26555138]
- Zenilman JM, Hook EW III, Shepherd M, Smith P, Rompalo AM, Celentano DD. Alcohol and other substance use in STD clinic patients: relationships with STDs and prevalent HIV infection. *J Sex Transm Dis*. 1994; 1(4):220–225.

Figure 1.

Mean (SD) days of substance use in the past 30 days at baseline and follow-up.

Notes: $N=21$. Two participants were lost-to-follow-up and assumed to have unchanged substance use from baseline (i.e., last observation carried forward). Heavy alcohol use was defined as 5 or more drinks of alcohol on an occasion. P-values are from paired t-test.

Table 1

Summary characteristics of the two pilot studies.

	Study 1	Study 2
Aim	establish feasibility of screening; characterize rates of SUDs	establish feasibility of linking patients to SUD treatment
Dates Fielded	9/2012–10/2012	3/2015–6/2015
Population	all adult STD clinic patients	adult STD clinic patients with opioid or cocaine SUD, not currently in treatment
Sample Size	100	21
Recruitment	Approached in waiting area	Referred to by clinic staff
Measures	Modified World Mental Health Composite International Diagnostic Interview (CIDI)	Modified World Mental Health CIDI; Study-specific questionnaire on substance use, medical service utilization; SUD treatment
Assessment Schedule	single interview at clinic visit	baseline (right after initial clinic visit); 1-month follow-up
Intervention	No intervention	Patient Navigation
Payment	\$5 gift card	\$25 for baseline; \$25 for follow-up

Table 2

Potential Barriers to Engaging in SUD Treatment and Navigator Response.

Example of Barrier	Navigator response
Ambivalence/resistance to addiction treatment	Explore and resolve ambivalence using motivational interviewing techniques; Deliver basic education to address health beliefs and increase health literacy about treatment options.
Discomfort interacting with SUD treatment staff	Explore underlying reasons for patient discomfort (e.g., low literacy; perceived stigma) and address with education and/or role playing; Advocate for patient with treatment staff.
Lacks health insurance or has insufficient coverage	Identify appropriate insurance eligibility and options; Help patient complete application and interface with insurance bureaucracies on patient's behalf.
Cannot afford SUD treatment medications	Identify and help patient sign up for prescription assistance programs; Interface with programs or physician(s) to discuss less costly alternatives.
Program requires photo ID	Identify nearest MVA; Assist with transportation and processing fees.
Provider is far or inconvenient	Assist with transportation (e.g., bus pass); Facilitate to more convenient providers.
Missed appointment	Reschedule; Remind patient about appointment; Accompany patient to appointment.

Table 3 Prevalence of substance use and DSM-5 SUDs in an STD clinic sample ($N=100$).

	Past Year Use (%)	DSM-5 SUD (%)
<i><u>Specific Substances</u></i>		
Tobacco	61	42
Alcohol	87	35
Marijuana	46	31
Cocaine	8	7
Heroin	7	6
Other Opioids (non-medical use)	8	5
Amphetamines (non-medical use)	6	1
Sedatives (non-medical use)	7	3
Hallucinogens	1	0
<i><u>Substance Classes and Combinations</u></i>		
Opioids (Heroin or Other Opioids)	15	11
Stimulants (Cocaine or Amphetamines)	14	8
Opioids <i>or</i> Stimulants	22	15
Alcohol or Drugs (excluding tobacco)	91	57
Any Illicit Drug (including prescription drug misuse)	55	41

Notes: DSM-5= Diagnostic and Statistical Manual of Mental Disorders, 5th edition; SUD= Substance use disorder; STD= Sexually transmitted disease.

Table 4 Participant baseline characteristics (Treatment Linkage Study; *N*=21).

	Baseline (<i>N</i> =21)
Health Service Utilization	
Number of Lifetime Hospitalizations, mean (SD)	3.7 (4.8)
Hospitalized in past year, n (%)	4 (19%)
Hospitalized in past 30 days, n (%)	0 (0)
Number of Lifetime Emergency Department Visits, mean (SD)	7.3 (6.1)
Emergency Department Visit in past year, n (%)	11 (52%)
Emergency Department Visit in past 30 days, n (%)	5 (24%)
Lifetime Infectious Disease Diagnoses	
HIV	5 (24%)
Hepatitis C	3 (14%)
STD (chlamydia, gonorrhea, syphilis, trichomoniasis)	12 (57%)
Substance Use	
Non-medical opioid use in past 30 days (heroin or prescription opioids), n (%)	16 (76%)
Heroin use in past 30 days, n (%)	8 (38%)
Non-medical prescription opioid use in past 30 days, n (%)	11 (52%)
DSM-5 Opioid Use Disorder, n (%)	16 (76%)
Cocaine use in past 30 days, n (%)	10 (48%)
DSM-5 Cocaine Use Disorder ¹ , n (%)	8 (40%)
Heavy alcohol use in past 30 days ² , n (%)	10 (48%)
Injection drug use in past 30 days, n (%)	3 (14%)
Never been in treatment for SUD, n (%)	10 (48%)
Sex Behaviors	
Unprotected sex in past 30 days, n (%)	14 (67%)
Sex while under the influence of drugs or alcohol in past 30 days, n (%)	17 (81%)

¹ n=20 due to missing data for one case (data entry error).

² Heavy alcohol use was defined as 5 or more drinks of alcohol on an occasion.

Table 5 Contacts with Patient Navigator over the one-month study period ($N=21$).

	Face-to-face visits (including initial visit)	Telephone contacts	Text Messages
Mean (SD)	2.6 (1.5)	8.8 (3.8)	4.7 (2.5)
Median	2	10	5
Min-Max	1–8	5–20	0–10